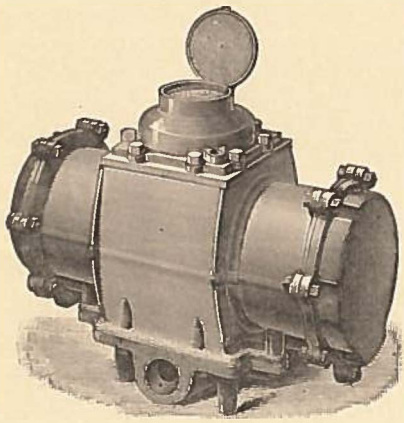
THE

METROPOLITAN

WATER METER.



MANUFACTURED BY THE

METROPOLITAN METER CO.,

22 NORFOLK AVENUE,

BOSTON, - - - - MASS.

AUGUST, 1893.

Introductory

AFTER a number of years of service of the **METROPOLITAN WATER METERS** in water works, with some five hundred and over (July 31, 1893,) in the Boston Water Department, we now beg to introduce these Meters to the public.

It is no egotism to say that the **METROPOLITAN METER** has proved in all respects the most perfect Water Meter ever introduced to service of Water Departments, and the reasons for this statement, and the proofs substantiating it, will be found in the following pages.

We have attained the perfection often promised in the numerous Meter pamphlets so freely scattered abroad, as the Water Engineer will discover on perusal of the accompanying letter press and illustrations.

These are bold words, but we know accurately all the devices now in use, their merits and disadvantages, and we say, and can prove, that our Meter combines all the good qualities of the best, without the drawbacks to which every one of them is subject.

Official statistics will bear us out, and we ask Water Superintendents everywhere to give us a trial, which will be to their advantage as much as ours.

Description of Metropolitan Meter, and Comparison with other Meters.

PISTON AND VALVES.

The Metropolitan Water Meter is of the reciprocating type, and would usually be termed a Single Piston Meter, though there are really two pistons — the main piston for measuring the water and the auxiliary piston to move the valves — which last reverses the flow of water from one end of the main measuring cylinder to the other end. It is positive in its action, and CANNOT be STOPPED on a DEAD CENTRE. It is constructed of composition, or of cast-iron with works of gun-metal. Both the main and auxiliary valves are FLAT BALANCED valves, sliding under a COVER, which relieves them from pressure and from the severe friction and wear incident to the ordinary unbalanced slide valve, as found in the Meters of the best type in ordinary service.

The pistons are made as light as is consistent with rigidity, and are free to rotate about their axes, which, with the lubrication of the water, prevent scoring and reduces wear to a minimum. The pistons and valves are made of the best composition, the cylinders and valve seats of a different mixture, experience showing that this is essential to produce the most satisfactory results.

The RECIPROCATING Piston Meter in its perfected form of the METROPOLITAN is a practical measuring device of HITHERTO UNKNOWN EFFICIENCY, which is assured for UNLIMITED TIME by its absolutely unprecedented freedom from friction and wear. The parts are so arranged that no sediment or other obstructing particles can find lodgment, and both piston and valve make fewer strokes to every cubic foot of water measured than are made by any other Meter.

REGISTERING DEVICE.

The Registering Device indicates the ACTUAL DISPLACEMENT of water, a POSITIVE RACK and PINION movement, a rack fitted between the piston heads, which travels along simultaneously with the piston, no matter what the piston stroke may be, thereby gathering corresponding travel upon a gear wheel which is meshed into the rack. As the rack travels by contact with

the pistons, so the pinion movement is positively RECORDING upon the meter clock the actual DISPLACEMENT of WATER.

This Registering Device is the first of its kind ever introduced into a Reciprocating Piston Water Meter, and is the only satisfactory mechanism recording ACTUAL DISPLACEMENT. It is fitted in such a manner as to permit of no lateral movement, yet sufficiently easy to allow the piston to rotate freely around its axis, which obviates wear.

ADVANTAGES OF A PISTON METER.

An important advantage possessed by the METROPOLITAN METER over all other Meters, irrespective of make, is the ability to overcome any ordinary obstruction that may get caught while passing through the valves. In such case it requires a SHEARING FORCE to CUT the obstruction; in most instances, small roots, pieces of grass, and foreign matter and sediment will flow through readily, but with fish, eels and larger obstructions, the mechanism must SHEAR them into small pieces or the Meter stops. Unless the obstruction be something serious the Meter should have sufficient force to overcome it, which is NOT the case with Rotary or Disc Meters. These Meters have very slight force and frequently STOP without apparent reason. A little FINE SEDIMENT interposed between the rotating piston and bottom plate will cause stoppage in Rotary Meters, and an intermitting flow, as a violent shock to either Meter or water fixtures may again start the flow. This may not occur for days or weeks, and may often cause serious embarrassment.

In the METROPOLITAN the construction of the valve is such, that being actuated by the auxiliary piston it has great force to overcome these obstacles. In the $\frac{3}{4}$-inch size the main piston is $4\frac{3}{4}$ inches diameter, giving an area of $17\frac{3}{4}$ square inches, which, with a water pressure of 60 pounds per square inch, gives 1,065 pounds behind it at any part of the stroke. When the main valve is moved by the force of the water acting against the auxiliary piston $2\frac{1}{4}$ inches in diameter, there is an area of four square inches, which at the same pressure gives 240 pounds to dispose of the obstruction. Certainly, an obstacle which cannot be overcome by such force ought to stop the Meter before injury is done its mechanism.

Another advantage of the METROPOLITAN possessed by NO OTHER Piston Water Meter where the valves are actuated by the direct force of the water, is the delivery of a SOLID, CONTINUOUS stream of water, WITHOUT BREAK or WATER-HAMMER, owing to the peculiar design of the auxiliary cylinder. EXTRAORDINARILY LARGE ports furnish water to move the main valve, so that the instant the main valve is on centre, nearly the full area of the pipe is drafted to move it, thus keeping up the FULL out-flowing jet.

Yet the rapidly moving piston is QUIETLY checked and reversed without sound or concussion. It must be remembered that no rubber bunter or any similar device is used, but by skillfully devised valves this powerfully driven piston is noiselessly operated. The METROPOLITAN is the only Piston Meter in which bunters are dispensed with.

CAPACITY.

Rotary and Disc Meters have a more free delivery than the ordinary Piston Meter, size for size; but we are prepared to prove that the METROPOLITAN has greater freedom of delivery than any Meter in existence, regardless of type. We welcome the attachment of a METROPOLITAN to a service pipe of larger size than that for which it was designed, where the Meter is not subject to a very close discharge upon the Meter's level, of the full increased size of piping.

The Boston Water Department has a number of Meters of our make doing satisfactory service upon an increased size service pipe with no complaint of lack of force or supply. We do not advise this use of the Meter, but in case of need it will perform the required service without unduly shortening its life or injuring its reliability.

SIMPLICITY.

The METROPOLITAN contains no rubber, vulcanite, leather, springs, weights, vibrating levers or mechanism liable to become deranged by long and severe service. It measures BOILING water as reliably as cold. This is a point for users of Rotary Meters to note and consider.

All parts of the Meter of a given size are interchangeable, all parts are fitted to respond to a pressure of less than a pound; hence friction is reduced to a minimum without leakage in the measuring cylinder. Any ordinary mechanic can make all repairs, should by accident any be necessary.

CHEAPNESS.

Notwithstanding a somewhat greater first cost than Rotary and Disc Meters, the METROPOLITAN will in service, prove cheaper than any Meter now on the market. It needs no argument to prove that METAL working parts are more durable than RUBBER.

The METROPOLITAN costs less for maintenance, has considerable value as old metal when unavoidably destroyed or injured, and during service will save to Water Departments a large sum now lost by the inaccurate performance of the Meters used. By OFFICIAL RECORD of the City of Boston, the METROPOLITAN has the HIGHEST average percentage of ACCURACY of any Water Meter in the service of the Water Department.

A SETTLED POSITIVE FACT.

The METROPOLITAN METER admits of no change or experiment; it is thoroughly developed and perfected in all its mechanical details at great cost in time and money, and has been in continuous service in the City of Boston since 1887. The success and superiority of this Meter OVER ALL OTHERS is an incontrovertible FACT, and it only needs a trial by other departments to obtain the same results. There are at this writing some five hundred and over in the service of Boston, so that our jubilation at the unprecedented success of our Meter stands on a secure basis.

Herein lies the success of the METROPOLITAN Meter: Perfectly balanced valves, protected from pressure; light, easy moving pistons; free passages; quiet movements; continuous delivery; displacement registration; best material; highest workmanship, and as LOW COST as any PISTON Meter of REPUTATION.

WHAT IS CLAIMED FOR THE METROPOLITAN METER.

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1. The most practical, efficient, economical and durable Piston Meter yet designed.

2. It has no DEAD CENTRE, and the piston CANNOT be placed in any position where it will not START READILY and measure ACCURATELY.

3. Measurement is recorded by a simple and durable device actuated by a positive rack and pinion movement, without any bell cranks, swivels or springs, with a dial dry and legible at all times.

4. It is impossible to PURLOIN water, though EXACT justice is meted out to consumers.

5. The valve mechanism is so constructed as to be practically without wear, the parts work easily and harmoniously, and the Meter is warranted to EXCEL all others in all the essentials of a water measuring instrument.

6. It will measure equally well, and with unfailing accuracy on HIGH or LOW pressure, and on streams from full capacity to drops.

7. It does not require any CHECK VALVE when used near hot water, as all other Meters do, and it may be attached direct to HOT WATER supply as there is no rubber or leather to be injured.

8. There is no interruption to the flow, consequently no water-hammer or objectionable noise in the pipes, nor is there any intermittent action, as always found in other Piston Meters.

9. It has less RETARDATION of flow, and a MORE UNOBSTRUCTED delivery than ANY Water Meter in the world.

10. Every part of the Meter is interchangeable; any part can be replaced by the workmen in Water Departments, or by owners of the Meter, without the need of returning it to the factory.

11. All working parts are constructed of best quality gun metal, and consequently not liable to corrosion.

12. LESS BULK and LESS WEIGHT, size for size, than any reliable Piston Meter.

13. The inlet and outlet are on the same line, hence are easy to attach to existing services.

14. It may be used on a larger size of service pipe than that for which it is designed, without interfering with the proper flow or injuring the Meter.

15. Should by mistake or otherwise the Meter be REVERSED in attaching to service pipes CORRECT REGISTRATION ENSUES.

METROPOLITAN METER ILLUSTRATIONS.

Fig. 0.

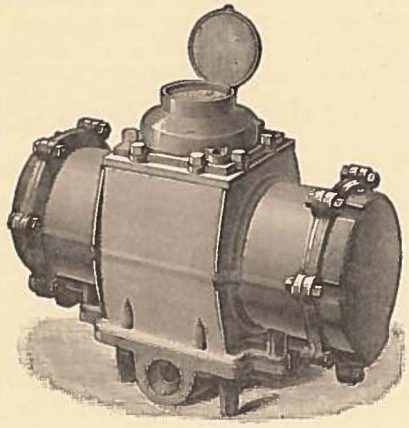


Fig. 0. Is a perspective view of the Meter, showing INDEX on the top. INLET and OUTLET in base upon same line.

Fig. 1. Represents a CENTRAL LONGITUDINAL SECTION of the Meter on line a. b., in Fig. 2.

Fig. 2. Represents a CROSS SECTION of the Meter on the line c. d., in Fig. 1.

Fig. 1.

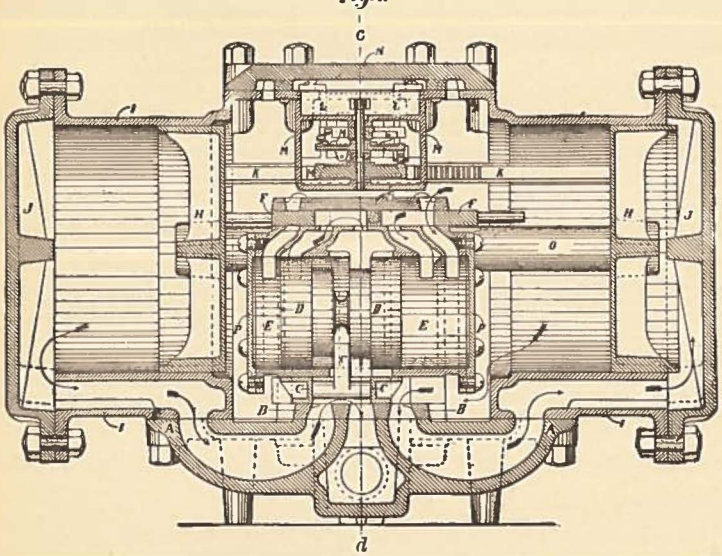


Fig. 2

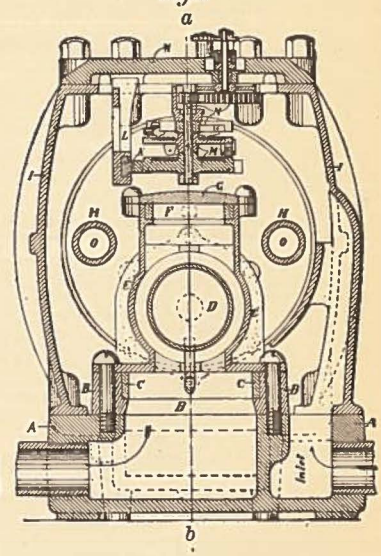


Fig. A.

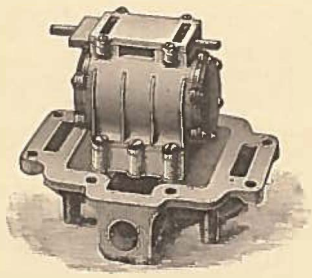


Fig. A. Represents the BOTTOM PLATE of the Meter with all valve mechanism attached, showing inlet port, from service pipe to interior of Meter, also portage through base of Meter to cylinder ends.

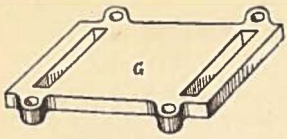


Fig. B. Is a view of the MAIN VALVE BASE.

Fig. C. Represents the MAIN VALVE, showing projection engaging with Auxiliary Piston D.

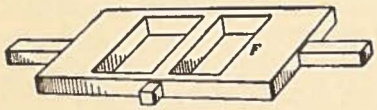


Fig. D. Represents the AUXILIARY PISTON, which operates the main valve C.

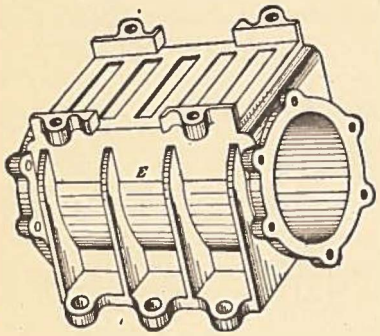


Fig. E. Represents the AUXILIARY CYLINDER, showing ports.

Fig. F. Is a view of the SUPPLEMENTARY SLIDE VALVE, operated by main piston, H.

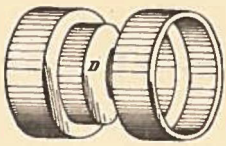


Fig. G. Is a view of the COVER to the SUPPLEMENTARY SLIDE VALVE, F.

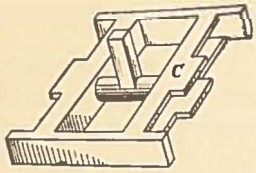
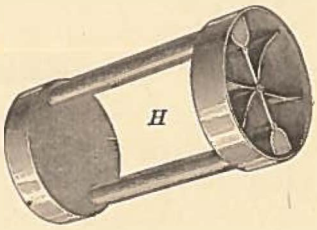


Fig. H. Represents the MAIN PISTON.



REFERRING TO SECTIONAL VIEW, Fig. 1.

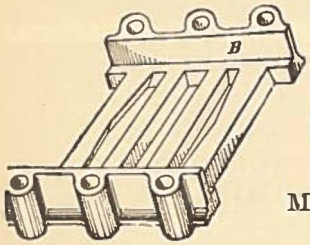
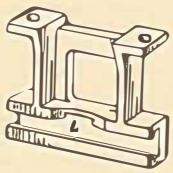


Fig. I. Represents the MAIN CYLINDER.
Fig. J. The CYLINDER HEADS.
Fig. K. The RACK.
Fig. L. RACK HANGER.
Fig. M. Represents the REGISTERING MOVEMENT and BRACKET.



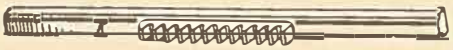


Fig. N. The TOP PLATE, to which is attached the registering mechanism.
Fig. O. The BRASS TUBING, connecting the pistons.
Fig. P. AUXILIARY CYLINDER COVER or END.

ORDERING PARTS.

All parts of the METROPOLITAN WATER METER of a given size are INTERCHANGEABLE. In ordering any particular parts of mechanism state SIZE of METER, the REGISTERED NUMBER of the Meter, and parts wanted as enumerated above. Such FIGURES to respective parts apply to ALL sizes of METROPOLITAN METERS.

ACTION OF PISTON AND VALVES IN METROPOLITAN METERS.

By examination of the several illustrations of parts, and corresponding descriptive explanation, it will be observed that all the movements of such parts are operative by the force or pressure of the water direct, the water entering the body of the Meter in what might be termed the water chamber, between the piston heads, thence passes through the valve portages to the cylinder end J, against the piston head H, the latter responding to the pressure against it moves along, encountering the auxiliary balanced flat slide valve F, which is carried along until opening large passages for water to enter the auxiliary cylinder E, operating the auxiliary piston D, which moves the main flat slide valve C, thereby instantly reversing the flow of water to the main measuring cylinder I, forcing the previously measured water to the consumer's premises.

It will be observed that there can be no partial movement of the main valve, without making an open passage for water, either the main port is open or the auxiliary port is open, hence there can be no dead centre, the discharge of water being continuous.

The area of portage throughout all sizes of METROPOLITAN METERS is greatly in excess of the area of such connections.

FOR CONSIDERATION.

The merits herein claimed for the METROPOLITAN WATER METERS admit of no misrepresentation, as conclusively proven and recorded upon official records, and by testimonials of experienced Water Works authorities. A perusal of the accompanying descriptive illustrations and explanation of action of the Meter mechanism, will readily enable the PRACTICAL Water Works Superintendent or Hydraulic Engineer to understand and appreciate the principle and construction of the METROPOLITAN METER, and compare such in every essential particular with ALL OTHER Water Meters with which he may be familiar. The more practical and experienced, the more pronounced and striking will appear to him the perfect consistency of all that is claimed for the METROPOLITAN METER.

The tabulated matter of Meter tests, and statistical condensation of Boston's experience with the "Worthington," "Crown," "Hersey," and "METROPOLITAN" METERS, reproduced in the closing pages of this pamphlet, is worthy of study by all interested in the subject of Water Meters. Likewise the abstract from the Boston Water Board's Annual Report for the year ending Jan. 31, 1893, relative to Water Meters, showing the purchase of METROPOLITAN METERS to be *more than that of* "Worthington," "Crown," "Hersey," "Thomson," and "Nash" Meters COMBINED; in number fifty-seven per cent. of all Meters bought.

The METROPOLITAN, though costing more than Rotary and Disc Meters, is the CHEAPEST Meter. Its purchase and use justifiably warranted by Boston through past and present experience with Water Meters. (See statistics on closing pages.)

Why the Metropolitan Water Meter was First Introduced in Boston.

Because it is a Boston Meter, invented by a Boston mechanic, managed by Boston men and exploited by Boston capital. Such being the case, it appeared indispensable to obtain the approval or otherwise of the Water Department at home.

This has been done very thoroughly, and the statistics will bear us out in our claim. These statistics are open to whomsoever chooses to consult them, and as we give chapter and verse for our assertions, the truth of them can be readily ascertained. We are desirous that this should be done, as it is well known that garbled and mutilated reports regarding other Meters have been sent forth in the guise of reliable information.

The Boston Water Department was the first to adopt business methods in regard to Meters, being driven into it by the heavy losses sustained by the worthless or inaccurate devices foisted on some of the former Boards. Now that the best methods of testing are employed, and a thorough and searching system of periodical inspection and re-test of Meters is carried out, the actual merit of any Meter is quickly discovered. If it has any weak points they cannot be hidden. They are officially recorded, and prove instructive reading to all interested in Water Meters. Every Water Superintendent throughout the country, who is worthy of his position, is aware of these facts; therefore Boston's opinion of any Meter is entitled to respect and consideration.

Any one interested has only to make inquiry to learn what this opinion is, and as the Board continues to purchase the METROPOLITAN this fact is better than any expression of confidence.

It will also be found that a number of Meters which are now enjoying a certain reputation in some quarters, have by the business methods in vogue in Boston, been proved to be altogether unreliable, and quite unworthy of confidence. It is unnecessary to name them; they will be found on the Water Department's records.

OUR CONCEPTION OF THE WATER METER SITUATION.

We assume that all Water Works officials are OPEN to CONVICTION; that it is QUITE POSSIBLE, in this progressive age, that there may be heretofore unknown to them a Water Meter surpassing in merit in all essential particulars those Meters they may have had years of experience within their

water service; and that they will cheerfully welcome for trial and test any new Water Meter that advances the claims, records and proof the METROPOLITAN WATER METER presents.

We are well aware of the merits claimed for the various Water Meters upon the market, and are not unmindful of the undertaking that confronts us in the introduction of what will be generally termed a new Water Meter, to be compared by many with Meters costing LESS money; hence looked upon as CHEAPER Meters. Upon this point, that of the low FIRST cost of Water Meters, we propose to devote some space in this pamphlet, claiming as we do, warranted by FACTS and FIGURES which we cite herein, that the argument that such and such Rotary or Disc Meters are CHEAPER Meters to purchase, is not tenable in the light of present events.

While we do not wish to disparage or willfully misrepresent the goods of other manufacturers, we believe the time has arrived to call a "spade a spade," and to present, for the consideration of all interested in the subject of Water Meters, an array of COLD, SOLID FACTS, supported and corroborated by VOLUMINOUS OFFICIAL STATISTICS and RECORDS at hand, showing conclusively the merits or demerits of the various Water Meters in comparison with the METROPOLITAN METERS, doing relatively corresponding duty in service.

We do not deceive ourselves in this matter, and propose that the FACTS shall be understood, even at the risk of being wearisome. Undue prominence has been given to the much claimed merits of certain Water Meters. We do not know any better way to overthrow the erroneous popular conception of such Water Meters than to assail such with FACTS and FIGURES. In so doing we abstain from any citations not matters of OFFICIAL RECORD and CONVINCING EVIDENCE of ACTUAL OCCURRENCE.

The struggle for supremacy between rival Water Meter makers has been waged so viciously for years past and at the present, one thing may be taken for granted, viz.: That the METROPOLITAN WATER METER, now RECOGNIZED as a DANGEROUS COMPETITOR, is not likely to be hoisted into any commendable prominence in the estimation of Water Works officials at the hands of rival Meter venders.

Give the METROPOLITAN METER the same show for a "fair, square deal" as given any and all other Meters, conditions and service alike and equal, and we cheerfully abide the verdict.

The METROPOLITAN WATER METERS are upon the market to stay; hence we solicit a share of the patronage of every City and Town where Water Meters are used. These Meters have been in Water Department service since 1887, and the recorded results prohibit their being classed in the same category

with Rotary, Disc, Oscillating, Proportionate, Diaphragm, and the what not that occasionally show up as Water Meters.

Despite the miscellaneous lot of exeeedingly LOW priced Water Meters sold with a seductive guarantee of years of repairs without cost thrown in, it is no egotism to claim for the METROPOLITAN WATER METER superiority in EVERY particular, and that it is the CHEAPEST Meter for Water Works to purchase, even if ANY and ALL the several Rotary and Disc affairs were PRESENTED to Water Departments WITHOUT COST, and their makers kept them in PERPETUAL REPAIR FREE OF EXPENSE. This statement is borne out by the experience of the BOSTON WATER DEPARTMENT, as shown in these pages.

The METROPOLITAN WATER METERS, though but a few years in service, in comparison with other make of Water Meters doing similar duty, prove by their uniform record to be the most creditable in point of accuracy, with no expense for maintenance; hence the CHEAPEST Water Meters ever produced.

A CRITICISM OF WATER METERS IN USE.

Of the urgent necessity of a PRACTICAL PERFECT WATER METER no doubt exists; this is universally conceded. Of the thousand odd letters patent allowed for improvements in Water Meters, with the exception of some half a dozen, all other devices have proved worthless and impracticable for the purpose intended, and are consequently abandoned. Of the several surviving Meters recognized of any merit whatsoever, a diversity of opinion prevails amongst Water Works authorities and Hydraulic Engineers, who are ever upon the alert for a SUPERIOR instrument to those Meters now forced upon them, by reason of their inability to obtain an instrument possessed of the requisite characteristics embodying a PERFECT Water Meter.

The great obstacle heretofore has been to find a Meter which was reasonably accurate upon VARYING DISCHARGES when new, and which WOULD CONTINUE SO IN LONG SERVICE; one that could be relied upon to work equally as well upon LOW as upon HIGH pressure; one that in its working would NOT OBSTRUCT the flow of water; one that would not become injured or destroyed by contact with WARM WATER, as frequently occurs where Meters are attached to pipes supplying boilers; one whose mechanism would not become CHILLED and FRACTURED by low temperature of water; one devoid of all mechanical devices of an INTRICATE nature subject to

BREAKAGE in service; one that was REASONABLY CHEAP, upon which REPAIRS are INEXPENSIVE, proving LONG-LIVED, RELIABLE and ACCURATE, and have SOME VALUE when ultimately sold as old junk.

All these desirable qualifications in a Water Meter are FOUND and PROVEN by TIME SERVICE in the METROPOLITAN WATER METER; the comparison in merits with other Meters in use this day, are matters of FACT open to the perusal of all interested, and PROVE CONCLUSIVELY their SUPERIORITY in EVERY essential particular over ALL OTHERS in the market, features accredited the METROPOLITAN WATER METERS, which are destined in time to be so acknowledged by all water authorities.

Discussing this subject of Water Meters necessitates a plain statement relative to the success of, and likewise the defects of, the various Water Meters in use, as we find such, from a mechanical standpoint, and by a non-biased citation of RECORDED FACTS established by ACTUAL SERVICE of such Meters in WATER DEPARTMENTS.

At the present we find contesting for Water Departments' patronage the "Worthington" (both old and new pattern), "Union Rotary," "Ball and Fitts Duplex Piston," "Crown," "Hersey," "Thomson," "Nash" and "Neptune." All of which respective makes of Water Meters have been upon the market and in service sufficiently long to be adjudged in accordance with their discovered worth, as recorded in all Water Departments using such meters, according to the capability and system in vogue.

Such has been the scramble amongst venders of CHEAP Rotary and Disc Meters during the past six years, resulting in large numbers being scattered throughout the country. The demand bordering on a craze for an exceedingly low FIRST cost Water Meter, excusable in the past, is not so at the present, where a systematic and proper business-like method prevails, and attention is paid to Water Meters IN SERVICE, and where the percentage of error in the Meter's accuracy of measurement is positively determined through WEIGHING the WATER in TANK upon CORRECTLY ADJUSTED SCALES.

Condensing the situation today, it simply means, pay a decently fair price for a PISTON METER, or get something in the shape of a Rotary or Disc principle at a somewhat lower FIRST cost, and take chances on results, throwing such into an ash heap when done with, without rebate in money.

The effected large sales of Rotary and Disc Water Meters are due solely by reason of compactness and low FIRST cost; in many instances, through causes set forth and explainable under the heading of "MERITS *vs.* FALSE ECONOMY" on page 28.

Water Meters are subdivided into two classes, viz.: POSITIVE or RECIPROCATING, and INFERENTIAL or ROTARY. In a positive Meter a measuring chamber is alternately filled and emptied, and the number of

fillings recorded; the action of the moving parts being similar to that of an engine piston; hence the name "Piston Meter."

Inferential Meters do not actually measure the water passing through them; registration depends upon the velocity of the current acting on a drum or turbine.

While, therefore, the accredited scientific authorities, Hydraulic Engineers and Water Work Superintendents are pronounced in favor of the PISTON METER over all others, yet there are some established principles to be observed in its construction as particularized in our DESCRIPTION OF THE METROPOLITAN WATER METER on page 5.

DOUBLE PISTON METERS.

Of this type two makes of Meters have for years past contested for the patronage of Water Departments which recognize the superiority of the PISTON METER.

These Meters are practically identical in character, principle and general appearance, of great bulk and excessive weight, regarded by some as a long lived Meter (if lack of system and inattention to repairs are the method in vogue), in REALITY a proven SHORT LIVED defective instrument where ATTENTION is paid to DUTY PERFORMED. In repairs they are expensive.

VALVES.

The valves in these DOUBLE PISTON METERS are flat slide valves, unprotected from the full effects of the inflowing water pressure; the valves being actuated by the pistons, wear rapidly and unevenly by reason of the inability to FLOAT smoothly across their portages, owing to the downward pressure of the water upon their exposed surfaces, as instances after service in the scouring and wavy appearance of the valves, valve seats and valve guides.

CAUSE OF WEAR.

The casual observer will clearly see that such must be the natural result, by reason of the constant starting and stopping of the valves in response to the opening and closing of faucets in drawing water; the statical pressure bearing down upon the exposed surface of the valves causes grinding or friction, soon producing uneven wear to surface of valves and valve seats; upon just starting to move across their ports, friction ensues, to be repeated upon stopping before coming to a rest, resulting in erratic wear of valves and valve seats, as shown after service.

PISTONS.

The pistons in these Meters are heavy non-revolving, causing friction and wear upon their under surfaces, with corresponding wear upon the cylinders, travelling back and forth in a rut, as it were; when wear once begins, it increases rapidly; hence leakage of both pistons and valves, proportionate to the duty performed, with a corresponding deprivation of revenue to Water Departments, which occasionally wake up to the fact that such discovery made earlier would have saved the Department the equivalent of the value of several such Meters.

LEAKAGE.

LOSS OF REVENUE.

REGISTERING DEVICE.

The REGISTERING DEVICE in these Meters in principle and function is radically wrong, a crude affair at its best; a swinging lever working a pawl in a coarse tooth ratchet wheel, irrespective of the length of stroke of pistons, such lever making but ONE movement REGARDLESS of DISPLACEMENTS of the PISTON; hence records the SAME registration upon the Meter clock upon a PARTIAL movement of the pistons, IDENTICAL as if pistons had displaced the FULL CAPACITY of the cylinder. Such principle is unsatisfactory, unreliable and inaccurate in service, becoming more so, through gradual elongation of stroke of pistons, as such grind and wear into the RUBBER BUNTERS or BUFFERS, secured in the cylinder heads for the purpose of receiving and cushioning the blows or concussions of the pistons.

RECORDS STROKES OF PISTONS.

RUBBER BUNTERS.

These DOUBLE PISTON METERS, though sufficiently accurate when new, soon deteriorate, and will not deliver the full capacity of the pipe for which they are designed, while the METROPOLITAN delivers more than the pipe can carry.

ROTARY AND DISC METERS.

All ROTARY and DISC Meters have valves and pistons made of RUBBER. HOT water, extreme temperature of COLD water, INTERMITTING FREAKS, DEAD STOPS by valves and pistons getting ON CENTRE, adhesion of SLIME and GRIT to rubber surfaces, are causes demon-

GENERAL DEFECTS.

HOT WATER.

strative to practical Water Works officials who have made a
INTERMITTING. study of the efficiency of Water Meters, that ROTARY and DISC Meters, though small in size and the lowest FIRST
DEAD CENTRE. COST Meters on the market, prove a DELUSION in service, a CONSTANT cause of DISPUTES and ANNOYANCE be-
EXPLANATIONS. tween authorities and consumers; NECESSITATING EXPLANATIONS WHY, under the SAME condition of service, SAME number of consumers upon the premises, hence the SAME relative quantity of water used daily, such surprising and incredible discrepancy occurs in the Meter's registration from month to month.

LOCKS THE PISTON.

It is a NOTORIOUS and WELL KNOWN FACT that the MOST MINUTE particle of foreign matter in the water supply entering these Meters, WEDGES or LOCKS the RUBBER piston, allowing water to flow through the Meter without registration for days and weeks at a time, a too sudden opening of a faucet, or a jar of the Meter, caused perhaps by the passing of a heavily loaded wagon in the street, releases the obstruction, and the Meter becomes operative again. This frequent and unavoidable intermitting feature of ROTARY and DISC Meters is now generally becoming known to purchasers of such Meters.

REPORTED STOPPED.

The Meter Inspector or Register Taker, upon visitation of premises, often finds ROTARY and DISC Meters STOPPED, and so reports at headquarters. In consequence, the Meter is detached from service pipes, put into a wagon, jolted over the pavements to the pipe yard or Meter Testing Department, only to find that the piston has been shaken off its centre, or the obstruction, if such was the cause of STOPPAGE has been released in transit. Such experience is very apt to cause friction between officials and subordinates.

RUBBER IN ROTARY AND DISC METERS.

In DISC and ROTARY Water Meters it is a prime necessity to make the rotating piston of HARD RUBBER or VULCANITE in order to get good registration, as a metal piston is too heavy, causing great friction and consequent erratic registration and bad wear generally, while vulcanite being of about the same specific gravity as water, practically floats as it revolves in the casing. Let HOT WATER get into a ROTARY or DISC Meter the Meter at ONCE BECOMES WORTHLESS, the hot water softening the vulcanite, the force of the water jams the vulcanite piston against the sides of the case or shell, distorting the piston, also the vulcanite lining of the shell where such is used. CHECK VALVES

may be used, but they are short lived and when (as is invariably the case), the check valve begins to leak, the Meter begins to give out and soon becomes USELESS AS A METER, even were such a thing possible as a reliable, durable check valve — one that would always be tight — then the water HEATS BACK INTO THE METER BY MERE CONTACT. The HIGH TEMPERATURE of places where such Meters are set causes trouble, the effects of the SUN'S RAYS upon a summer's day, through exposure or transportation, are said to soften and distort the RUBBER interior of ROTARY and DISC Meters.

FRACTURE OF RUBBER PISTONS.

ROTARY and DISC Meters are injuriously affected by extreme COLD temperature of water, the vulcanite becoming chilled and cracking. Violent concussions (often caused by too sudden shutting off of water in service pipes), produce severe water-hammer, causing fracture of the vulcanite piston.

Effects of Grit, Slime and Impurities of Water Supply on Rubber.

Most waters are more or less impregnated with grit, sand, slime or vegetable matter. RUBBER or VULCANITE from its VERY nature, quickly gathers such. The necessary shape and operation of a ROTARY and DISC Meter are ESPECIALLY adapted to retain sediment, which soon clogs the piston, producing great wear, and finally STOPPAGE; the water passing through the Meter without registration, which accounts for such a large percentage of ROTARY and DISC Meters being reported STOPPED in SERVICE. It stands to reason that with the accumulation of such foreign matter upon its RUBBER surfaces, the velocity of the rotating piston in a ROTARY Meter, and nutating piston in a DISC Meter is affected; hence disarranges the free unobstructed opening and closing of the valve portages with a CERTAINTY, (as PROVED by Water Departments official records); thus discriminating against the City's revenue or the consumer, in accordance with the character and effects of such deposit upon the vulcanite mechanism.

DISC and ROTARY Meters testing accurately today, prove unreliable tomorrow; statistics record instances where comsumers of water through Rotary and Disc Meters have paid water bills for LARGE QUANTITY of water NEVER USED, erroneously recorded by such defective Meters.

A SUGGESTION.

If any one questions the correctness of such criticism of ROTARY and DISC Water Meters, the means of proof is easy. Take off from service a Meter of such description which has been doing duty for the period of a year or longer; test the same for accuracy, WEIGHING the water, then take the

Meter apart, wash off the RUBBER piston under a faucet, put Meter together again; RE-TEST for accuracy as before, and you have it.

EXCESSIVE REGISTRATION.

This peculiar freak in ROTARY and DISC Meters is discovered and recorded weekly by the BOSTON WATER DEPARTMENT, generally by reason of the Meter being ordered out for purpose of test, prompted in many instances by EXCESSIVE INCREASED recorded consumption of water upon premises, where beyond question, NO CAUSE existed for such.

ROBBING THE CONSUMER.

To cite an illustration: Meters of this type when new from factory, tested for accuracy BEFORE being put at service, deliver, say 625 to 630 pounds of water as an equivalent for ten (10) cubic feet registration upon the Meter clock. Upon a RE-TEST of such Meters to determine their accuracy, often after a MODERATE duty performed, the delivery of water in weight for ten (10) cubic feet registration, DROPS to 600 POUNDS or LESS, as recorded in the various Boston City Documents cited on page 22.

TO WHAT EXTENT.

Now wherein does this interest the consumers upon whose premises such defective, discriminating Meters were placed? Simply in this, that the consumer has paid to the Water Department, innocently, for twenty to thirty pounds of water in excess for every ten cubic feet, or for 200 to 300 pounds of water for each 100 cubic feet, that the Meter clock says he used and paid for, the EQUIVALENT of WHICH HE NEVER RECEIVED. A matter of four to six per cent. computed upon the quantity charged in the water bill, amounts, perhaps, to quite an item.

WHY NOT?

Query? Where such instances are a matter of OFFICIAL RECORD, why are not such innocent victims JUSTLY entitled to "kick," demand, and obtain a rebate upon such erroneous paid water bills? Are such Water Meters CREDITABLE for STRICT business purposes?

Depriving the Water Department of Revenue.

In this connection, that of inaccuracy of ROTARY and DISC Water Meters, a Meter of the former type much advertised as having extraordinary large sales, etc., etc., proves NOTORIOUSLY DEFICIENT as a rule (though there are many exceptions, as described above, shown in official reports cited herein), in the OPPOSITE direction, *i. e.*, DEPRIVING the Water Department

of a LARGE portion of its REVENUE, fifteen to sixty per cent. is not uncommon upon a LIMITED duty performed in over-delivery of water against the registration of the Meter clock. For a COMPLETE VERIFICATION of this statement, also that quoted pertaining to discrimination against the consumer or tax-payer, we would respectfully suggest a perusal of BOSTON CITY DOCUMENTS Nos. 136, 138, 154, 155, 166, 195 and 208, for the YEAR 1890; ALSO Nos. 5, 44, 62, 85, 99, 114, 122, 135, 151, 164 and 171, for the YEAR 1891, AND THE BOSTON WATER BOARD'S OFFICIAL MONTHLY WATER METER TEST REPORTS for the past three years up to, and TIME of YOUR READING this pamphlet.

ABUNDANCE OF EVIDENCE.

BOSTON'S CITY DOCUMENTS.

OF SPECIAL VALUE.

To those interested in the subject of Waters Meters, valuable and surprising information may be obtained to many; knowledge of special value, particularly to Superintendents and Water Works authorities of small Cities and Towns where the Water Meter is about to be introduced. The cited City Documents and Reports, likewise several SPECIAL Reports upon the subject of Water Meters, NOTABLY BOSTON CITY DOCUMENT NO. 211, 1890, ENTITLED, "COMMUNICATION from the BOSTON WATER BOARD RELATIVE to CROWN METERS," affords abundance of evidence as to the worthiness or worthlessness of the several Water Meters in use; proof convincing of the certainty of truth or fact. There is no getting away from these FACTS and COINCIDENCES, so complete, so voluminous, of such uniform tendency as to constitute data leading to conclusions from which it is difficult to escape.

FACTS.

We might particularize innumerable instances of COLD, SOLID FACTS recording peculiar "FREAKS," FATAL DEFECTS, and UNRELIABILITY generally of ROTARY and DISC Water Meters in SERVICE, copied from Water Department OFFICIAL records. That such deficiencies and vital defects do exist, is becoming more generally known by water authorities, though never publicly proclaimed with any great force or demonstration of facts.

LOW FIRST COST.

Such defects if made a subject of OFFICIAL INQUIRY and INVESTIGATION would result in cause sufficient to displace such Meters, and naturally create a preference in the choice of Water Meters for use upon the part of cities and towns with less stress laid upon the low FIRST cost of the Meter.

PURCHASE OF METERS A BUSINESS MATTER.

It is with FACTS, and not with theories that we are dealing. We admit that denunciation is not argument; but FACTS are STUBBORN THINGS, and are not to be permanently turned down. The purchase of Water Meters by water authorities is a BUSINESS MATTER, pure and simple, and not a matter excusable by reason of IGNORANCE or FAVORITISM.

STOPPING THE WASTE OF PUBLIC MONEY.

It does seem that the dearly bought experience of the immediate past in the history of Water Departments of some Cities and Towns should bear some fruit in the form of plans, for at least reducing the constant waste of public money spent for what proves to be in service WORTHLESS Water Meters.

LEATHER AND RUBBER IN WATER METERS.

Experience proves that LEATHER PACKED PISTONS in a Water Meter scour and wear the cylinders by reason of the leather gathering grit and sediment which become embedded in the fibre of the leather, having the effect upon the cylinder, like unto sand paper rubbing, hence frictional wear, causing excessive leakage. When such Meters are taken from service, if only temporarily, the leather SHRINKS and HARDENS, never again to become SOAKED or SWELLED out to its ORIGINAL FIT. Pistons packed with leather should be re-packed yearly to insure accuracy of measurement of the Meter. Such labor and expense enforced upon Water Departments is undesirable.

LEATHER PACKED PISTONS, RUBBER, or any article of a PERISHABLE nature entering into the construction of a Water Meter in ANY FORM whatsoever, soon brings such Meter into disrepute.

Consequently a Water Meter in the construction of which NO PERISHABLE SUBSTANCE enters, is unquestionably preferable. The METROPOLITAN WATER METERS thoroughly fill this requirement.

PURCHASING WATER METERS.

It is manifestly the true policy of every buyer to obtain the best article of its kind, a Meter of the best make is indestructible in ordinary wear; therefore the METROPOLITAN is the cheapest, though its first cost is greater than that of Rotary or Disc Meters.

Surely it is not necessary to point out to any intelligent man that METAL

must be more durable than rubber, and it is not liable to injury as is the last named material. Accidents which would destroy the rubber lining and piston have no ill effect on the structure of the METROPOLITAN, and in case of the destruction of the latter, its material has still a value which is not to be despised.

If the Meter buyer has no means of informing himself by trial, the statistics of Boston's experience are open to him, extracts are given herewith, and the reader is recommended to compare them with the originals to insure belief, and to *do the same with the citations of all other Meter manufacturers.*

A low priced Meter is a poor Meter; it is usually constructed of indifferent material for the use it has to undergo, it is uncertain in operation, inaccurate in its results, and is certain to do injustice to either buyer or seller. It is no economy to buy such articles, and this is rapidly becoming a recognized fact. These devices have had their day, and must now give way to better machines.

We wish it to be understood that while we deprecate any comparison between the METROPOLITAN and any Rotary or Disc device, we welcome comparison and test with any Piston Meter in the market, confident that the best of them are lacking in many respects as compared with our Meter. Even the best of these are heavy and cumbrous, taking up valuable space. Their pistons grind and wear themselves and the cylinders, making leakage; their valves are unprotected; their rubber bunters are liable to be destroyed by HOT water; in any case, they wear and lengthen the stroke, delivering more water without equivalent registration.

We venture to assert that our criticism of the various Water Meters on page 15 is strictly correct, and in accordance with the views of every *practical* Water Works Superintendent who has had *personal experience* with such Meters; such criticism, coupled with the official showing of Boston's experience with such Water Meters as reproduced on pages 38 to 55, are justifiable reasons why such Meters are the most EXPENSIVE for Water Works to purchase. The Water Meter that is free from all such adverse criticism, as is the METROPOLITAN METER, is unquestionably the BEST and CHEAPEST Meter to purchase by all odds.

Purchasers of Water Meters are confined to a choice of a Piston Meter, or one of the Rotary or Disc type at a lower FIRST cost; in many cases in the absence of *practical knowledge of the characteristics* of the various Meters, prompted by a desire of economy, the choice favors the lowest price Meter, (a Rotary or DISC.) As a result, in Water Departments where proper Meter testing facilities exist, and a systematic system prevails of occasional re-tests of Meters after a stated duty performed, the results show that the tempting LOW price paid for such Meters proves deceptive; that the desirable qualifications, those of reliability, accuracy and durability, are of more consequence than the

low FIRST cost of such instruments. THE METROPOLITAN METER, costing upon purchase a little more, unquestionably proves more reliable, accurate, and lasts longer, hence is by far the cheapest. The LOW price of a Water Meter does not signify its CHEAPNESS by any means, as many Water Departments have discovered. Upon the intrinsic worth of the Water Meter depends the SUCCESS or FAILURE of the METER SYSTEM of that City or Town. It is a false spirit of economy to buy Water Meters (the most deceptive of any article of mechanism) simply because such APPEAR CHEAP. The chief points of excellence in a Water Meter are reliability, durability and accuracy, and not CHEAPNESS itself, or new and novel features. The fact is perfectly clear that the BEST Meter, like the BEST of any other article, must be made of the BEST of material, and lasting.

The deluge of low FIRST cost Rotary and Disc Water Meters throughout the country the past few years, have served a purpose in many places—that of the introduction of the Water Meter into some Water Works service, where through a MISTAKEN IDEA OF ECONOMY, the higher price PISTON METER would have been regarded as an obstacle towards the inauguration of a Meter system; the sole excuse for such purchases being that they cost less IMMEDIATE outlay of money than an equal number of PISTON METERS; hence the reasoning that so much money went so much further—ERRONEOUS ideas — convincing through substantial evidence after a time service of such Meters.

Experience of the average users of Water Meters have discovered defects of one kind or another in all Meters heretofore upon the market. Realizing this, we would respectfully suggest to Water Works authorities, about to purchase Water Meters, to take on trial and test for comparative worth, a METROPOLITAN METER, and investigate the Boston Water Department's FIVE YEARS' experience with these meters.

METER INSPECTION.

No community, unless water be as plentiful as air, can afford to dispense with a system of inspection, and the records of the Meters used should be methodically and correctly kept. IT PAYS TO DO SO. A record of every Meter should be carefully compiled; the make of the Meter, its registered number; the date it is put to service; registration of the clock, and upon its performing a stated duty in accordance with its size and character of service, should be re-tested for accuracy from time to time.

The intelligent observer will soon learn to observe whether or not the Meter

is doing its duty, and whether it is truthfully recording the water delivered. It is only by such a method of comparison that the merits or disadvantages of the various Meters can be studied, and the time, labor and cost will be amply repaid.

The experienced Water Engineer and Inspector will readily perceive that we do not presume to inform him on these matters; but throughout the land there are many to whom Meters, methods of trial, inspection, and so on, are unfamiliar, and as they are desirous of information, we write these lines for their benefit. It may also be said that there are places where these facts are known, but not acted upon, and if this paper serves to awaken delinquents to a sense of what they owe their community, we shall not have written in vain.

Not a few communities content themselves with purchasing and placing Meters, relying on the moral effect; no inspection is attempted, and the Meter receives no attention so long as it delivers water. In such instances the cost of the Meter is thrown away; a cheap device is generally used, and the responsible official expresses his satisfaction simply because he knows nothing about it, and does not care to inquire. The loss of revenue under such conditions is heavy, and it only needs a trial of a few weeks careful, methodical inspection and test of condition to show that the expense incurred is saved many times over by a judicious outlay on the lines indicated. Where statistics are kept, it will be found that from fifteen to sixty per cent. of water is, in many instances, delivered without bringing any return.

TESTING WATER METERS.

As the introduction of Water Meters is a comparatively new idea in many of the Cities and Towns of the United States, it is natural that a number of the Superintendents in charge of Water Works have but crude notions as to the proper methods of testing Meters, and lack system in the proper management of them. They are frequently content to let the Meter be put at service, as received from the maker's hands, without an accuracy test; though it is well known that many of them show a very considerable discrepancy even when new from the manufacturer. Such discrepancy with some make of Meters becoming more conspicuous after a limited service.

As a rule, the favored Meter has received a durability test of some character, such perhaps, which the well informed expert would call no test at all; for example: The connection of various Meters in a line, one taking the water from another, their respective registration computed with a particular Meter in the line regarded as accurate, irrespective of the effects of the pulsa-

tion and retardation of flow, caused by variety of mechanical movements of such Meters passing the same water. Or the practice of testing a Meter to get LARGE duty performed in a SHORT time, that of allowing a Meter to pass a stream of water through a given size orifice, or discharge jet, under a FIXED condition of PRESSURE and CIRCUMSTANCES continuously, thereby escaping the attending friction and wear incident to the frequent opening and closing of faucets at different elevations in building; hence the starting and stopping of the Meter's mechanism as often as water is drawn, showing perhaps fatal defects, such as intermitting freaks, a positive dead point, or the breaking of some essential parts.

Nothing could be more fallacious or misleading; such methods of tests are entirely contrary to the character of usage the Meter would have received performing the SAME duty if attached to a SERVICE pipe in a BUILDING. How many Meters at service work continuously without stoppage? The inaction of the Meter's mechanism collects slime and sediment which clogs Rotary and Disc Meters badly, as shown and proven by the Official Meter Test Reports of Boston, (see pages 38 to 55), CONCLUSIVELY proven if YOU will IMITATE Boston's methods.

Again, in the testing of Water Meters for accuracy, (the most important feature in connection with the handling of Meters), with some Superintendents, a so called Test Meter (supposed to be absolutely accurate), is preserved for the purpose of testing other Meters. Some are satisfied with measuring the water delivered by the Meter by using a wooden tank or barrel marked to indicate a certain number of cubic feet of water. This is very uncertain; error is easily made, in fact, accuracy is impossible, as the flow towards the mark must be checked to such an extent that full flow cannot be measured at all, and small deliveries in such a way as to be little better than guessing at the result; the larger in area is the tank, the worse the result.

There is BUT ONE way to PROPERLY TEST a Water Meter, put it under the conditions of service; time the run accurately, and WEIGH the WATER.

The first money spent for a Water Meter service should properly be spent for suitable TANK and SCALES. Start right and establish a rigid system of inspection, and the occasional re-test of ALL Meters in service; the results will determine which of the various Meters is worthy of being purchased for use.

The outlay for suitable SCALES and TANK with required fittings need not necessarily be great; the discrepancy in accuracy discovered in Meters in a short time, necessitating their re-adjustment to accuracy, will save the Water Department in water, or the equivalent in money, far more than the cost of such fixtures. The exact percentage of loss or gain in revenue by use of Meters can ONLY be ascertained by WEIGHING the WATER.

A neglect or indifference to re-test the Water Meters in service, after a reasonable duty performed, simply means increased inaccuracy; hence increasing loss of revenue, or excessive injustice to the consumer, and a most decided increase of expense towards repairs of such Meters when ultimately attended to. The City of Boston saves thousands of dollars QUARTERLY in revenue by reason of its common-sense business methods in the handling of its Water Meters.

In the perusal of the Meter Test Reports on pages 38 to 55, bear in mind that 62·5 pounds of water indicates one cubic foot, or 625 pounds for ten (10) cubic feet, and you will see the importance of occasional re-test of the Meters by WEIGHING the WATER.

MERIT VS. FALSE ECONOMY.

We are constrained to criticise the policy that prevails in some Water Departments towards a lack of system and attention in the management of the Water Meters, especially where there are no proper Meter testing facilities wherewith to test, or know anything about the accurate state of the Meters from date of purchase to consignment to the junk heap. In such cases, the fact that the Meter is used is expected to prove effective to prevent waste, the characteristics of Water Meters are unknown, the predominating idea being the supposed moral effect of the use of the Meter, whether the Water Department is being deprived of a large portion of its revenue, or the consumer is unjustly served by the use of such Meters, remains a question ultimately to be answered, attributing the lack of system prevailing as the cause of the non-success of the Meter service; whereas had some common-sense business ideas prevailed, such as tank and scales, periodical inspection of and re-test of the Meters, the defective instruments would have been weeded out, re-adjusted to accuracy, or sent to the factory for repairs, the Meters being kept in an efficient state, showing an increase in revenue, with corresponding credit to the Water Department.

In some small Cities and Towns, the selection of a Water Meter, THEORETICALLY "all right," by inexperienced Water Committees or Commission, whose tastes and inclinations follow a calling entirely removed from any education in hydraulic engineering or its attending matters, so essential in the management of Water Works, quite often results in practice "dead wrong;" and an utter failure, leaving object lessons for the edification of the succeeding Committee or Commission.

In such places where one Water Meter is not distinguishable from another in point of merit, invariably the low FIRST cost Rotary or Disc Meter receives

first consideration — FIGURATIVELY a matter of POLICY, economy in spending of money, a creditable desire to get the most material for a certain amount of money, in the mistaken idea that such Meters will answer all requirements; time service of such Meters proving that the money was misspent, and might as well have been thrown into the sewers. We claim, supported by abundance of evidence, that Rotary and Disc Meters cannot be called cheap at ANY PRICE, as many Cities and Towns looking more to FIRST cost than anything else have discovered. By experience they have learned the many disadvantages of the LOW COST Meters, and are now willing to pay a better price for a reliable article. Meters are like all other articles, the BEST commands a good price, and is worth it; it proves the CHEAPEST on account of its RELIABILITY, DURABILITY and ACCURACY, and money recovered for old metal when destroyed.

With all Rotary and Disc Meters, after a limited service, indisputably it is a case either of excessive over registration against the consumer, or under registration against the revenue; the experience of the Boston Water Department for years past shows such to be the case. We avail ourselves of such history, and reproduce in these pages a few "specimen bricks," copied from Boston's Official Reports, without change or alteration in any degree, which shows that the purchase of CHEAP Water Meters governed solely by their low FIRST cost is not profitable to Water Departments. Having them, they are utilized only through constant inspection — re-test and repairs — though better have been thrown away when first becoming troublesome. On page 15, under the heading, "A Criticism of Water Meters in Use," we plainly state our understanding based upon personal experience, WHY and HOW such excessive variations in registration of Rotary and Disc Meters occurs; and we venture to say, our views will be endorsed by every *practical* Water Work official or Master Mechanic *personally* experienced in such matters.

The item of FIRST cost of a Water Meter should be considered with some caution; for the reason that this item is so often an imaginary and highly variable one if based upon the FIRST IMMEDIATE OUTLAY, that of the PURCHASE PRICE of the Meter.

The confinement of some Water Departments to a cheap, inferior Meter made of Rubber, ignoring all others, accounts in some instances for the subsequent abandonment of the Meter system, resulting in the forced expenditure of large sums of money to increase the water supply.

We will admit that there are certain Cities, some possessed of proper Meter testing facilities, having large numbers of cheap Rotary and Disc Meters in service, and adding thereto. Why? Is it because the knowledge of such departments is confined to the ORIGINAL test of such Meters when NEW and FIRST set, never taken out of service for purpose of re-test, owing perhaps to

the physical inability of the two or three employees to handle so many Meters? It looks that way. Or why is it that the same discoveries of serious defects of such Meters are not known, as chronicled by the Boston Water Department; and hence, why could not that loss of fifteen to sixty per cent. in revenue by the use of such Meters be saved, and thus benefit the tax-payers?

Age, hot water, fracture by concussion, obstructions, freezing, etc., yearly render worthless a large percentage of Meters made of RUBBER; for which material no rebate in money is received. Contrast such with the market value of composition metal in a PISTON Meter.

Cheapness of Water Meters, devoid of merit, interests the tax-payers, who not only pay their proportionate expense towards running the City or Town government, but as property owners are expensively served where such Meters are forced upon them at expense of purchase and maintenance, by reason of such City or Town officials having approved or adopted such Meters.

To inquire or observe, is to learn. Proper methods as applied to the system in practice in the Boston Water Department, will well repay all authorities interested in the management of Water Meters. To study and copy such methods cannot but help proving both economical and effective in a business way. Attention to duty performed is most essential, as shown by a careful perusal of the statistics in these pages faithfully reproduced from the Boston Water Department Official Reports, where the merits or demerits of the various Meters clearly appear. A little figuring mathematically at current Meter rates, will show in dollars and cents how many reliable METROPOLITAN METERS could have been bought, could the value of the water unregistered by numerous individual Meters, as shown all through the list, been saved the Water Department.

Such experience being known and recorded by reason of proper business methods, what must be the situation in Water Departments where no system prevails? The Meters neglected, wearing out in service.

Where honest merit in Water Meters is sacrificed for POLICY'S sake by purchase of the cheaper FIRST cost Rotary and Disc affairs on the market, history invariably repeats itself; the public money thus spent, is not only wasted, but additional expenditure of money becomes necessary in order that such defective short-lived Meters may be maintained in service and perform some semblance of use; in Boston, experience justifies their condemnation to a junk heap when first becoming troublesome; hence avoiding loss of revenue, annoyance arising through disputes and controversy, saving time and labor, which would prove wasted repairing such Meters.

Buy the BEST attainable; they come higher, but the first cost will prove the ONLY cost for years to come; hence the CHEAPEST, the most satisfactory, and most profitable investment for Water Departments.

Necessity of Water Meters as Preventives of Waste.

The primary object in using Water Meters is to check waste. That this may be satisfactorily accomplished, the device employed should be the best of its kind. We insist that this requirement is met by the METROPOLITAN METER to the fullest possible extent, and a careful, exhaustive and competitive trial will demonstrate this to the most sceptical.

The rapid growth of Cities and Towns, with its attending increase of population, diminishes the water supply, hence compulsion to check the wanton waste. As a rule the demand of the water takers is always in excess of the storage capacity of the works. Many other sources to which the popular mind has been turned from time to time with a sense of security against the future need, are gradually being cut off, and we face the question of a supply for the future. Pure water uncontaminated by sewage is becoming scarce.

The large cities are reaching out in every direction for water, and in many cases encroaching on the sources which furnish the country towns. This compels the latter to construct Water Works to accumulate and preserve their stock of water against a time of drought. In order that the cost of these Works and their maintenance may be defrayed, it is essential that a revenue be obtained, and to do this with justice to all, it is a prime necessity that the supply be accurately measured, that the consumer may get all he pays for, and the City or Town may get a proper return for what it furnishes. It is well known that many communities which found themselves restricted in their supply, through unregulated use, have by the use of Meters found themselves amply supplied, and with an augmented revenue.

This fact goes to show that no City or Town can afford to postpone the duty of obtaining a permanent water supply, nor having it, can consistently neglect to have its delivery properly checked and measured as can only be done in the best possible way by the METROPOLITAN METER. There are numerous instances, at this moment, where Water Boards are not obtaining anything like the revenue which is justly their due, owing to the non-performance of their proper duty by the inferior Meters, which parsimony or ignorance have caused to be supplied. A liberal policy in purchasing only a reliable article is true economy; and the prudent Water Manager will promptly inform himself in regard to the METROPOLITAN, and to inquire is to buy.

It is practically conceded by all experienced observers that at least fifty per cent. of the water supplied to large Towns and Cities is willfully wasted; estimating that thirty gallons of water per day per capita is a liberal allowance for manufacturing and domestic purposes, and should suffice abundantly for all legitimate use, the actual consumption ranges from sixty to one hundred or

more gallons per day per capita; thus for every gallon legitimately consumed, two gallons or more are wasted.

Improper fixtures and bad plumbing are the primary cause of the excessive waste of water. Water closets that require a constant running stream of water to make them tolerable; the use of hopper water closets, and self-acting closets, defective ball cocks and faucets; urinals which are constructed for a continuous flow of water with no reference to economy; the necessary free use of water in saloons to operate pressure pumps; the use of hand hose for irrigation and washing purposes, and the steady flow of water during extreme cold weather to prevent freezing of pipes. This character of waste can only be reached by an appeal to the pockets of the water takers. NOT UNTIL THEN will the wastefulness of careless persons be checked. People WILL NOT repair their defective fixtures; WILL NOT stop wasting water until COMPELLED to do so by adoption of a measurement system which will OBLIGE them to pay for all the water used. One or two water bills paid by Meter measurement, generally stop all defects and leaks, which otherwise would have received no attention.

The only equitable system which will equalize all consumers is the SALE of WATER by METERS applied to EVERY building, then every one will pay for what he uses, no more, no less, as accurately as it can be ascertained, and the responsibility for waste is fixed upon the ACTUAL CULPRIT by the Meter.

The injustice of the Assessment System, that of fixing a schedule rate as a water tax upon the valuation of property, can be pointed to in all Cities and Towns where SUCH METHODS prevail, as instanced in two houses adjoining under the same roof, the valuation identical, water fixtures and interior conveniences alike; one house occupied as a private residence; house closed and water shut off during the summer months; the other house occupied and run as a lodging or boarding house with its full complement of occupants the year around with corresponding consumption of water. Comment is unnecessary, otherwise than to say that the WATER METER would DO JUSTICE alike in such cases. What sense is there in paying for water according to the valuation of the house we live in, or the number of fixtures in it, any more than paying for the beef we eat in that house, on the same plan.

Water Meters not only increase the revenue from water, but check waste, and by checking waste, raise the pressure on the mains, and in many instances obviate the immediate outlay of enormous sums of money for an increased supply, expensive pumping machinery, and distributing mains. When one great leak can be so easily stopped, and in such a common-sense way, the wisest thing to do is to set about it at once.

And in so doing, first become informed of the characteristics of the several Water Meters in the market. The METROPOLITAN METER will prove the CHEAPEST and most satisfactory by all odds, as instanced by Boston's FIVE YEARS' experience with these Meters.

Where the Metropolitan Water Meters were First put into Use.

OFFICE OF WATER COMMISSIONERS,
TOWN HOUSE.

ANDOVER, MASS., March 10, 1892.

METROPOLITAN METER COMPANY, BOSTON, MASS.:

Gentlemen,— In reply to your inquiry, I would say that the five-eighth-inch and three-fourth-inch size Metropolitan Water Meters have been in constant service during the last two years or more, and have given no trouble whatever. They have never been taken from the connections except for test.

In point of accuracy, durability and reliability, I consider the Metropolitan ahead of any Meter which has come under my observation.

Enclosed herewith find order for more five-eighth-inch size Metropolitan, which please forward with bill as soon as possible.

Yours truly,

JOHN E. SMITH, *Superintendent.*

OFFICE OF THE WATER REGISTRAR,
CITY HALL.

BOSTON, July 19, 1892.

METROPOLITAN METER CO.:

Gentlemen,— As I am about to retire from the office of Water Registrar, after a service of upwards of forty years, I deem it but simple justice to you to record my appreciation of the excellent qualities of the Metropolitan Meter. As you are aware there are about three hundred of this style Meter now in service, and a considerable portion of them have performed sufficient duty to enable me to correctly judge of their merit. I have from time to time taken out a large portion of them for the purpose of determining the delivery under various heads, accuracy of registration at various rates of delivery, wearing qualities, and probable expense of repairs; the results obtained are on record for your inspection at any time.

I am pleased to say that the exactness of measurement and durability of the wearing parts and consequent minimum expense of repairs shown are most satisfactory, and therefore see no reason why our Board, when they consider its merits, should not give your Meter the preference over all other styles for our future service.

Respectfully yours,

WM. F. DAVIS, *Water Registrar.*

METROPOLITAN HOT WATER METER.

Where required for HIGH PRESSURE HOT WATER SERVICE are specially constructed. In ordering Meters for such service please so state.

TESTIMONIALS OF EXPERIENCE WITH HOT WATER METERS.

F. H. CRANE, *Engineer.* FACTORIES, FLORENCE, MASS.

EMERSON POWER SCALE COMPANY,
12 POST OFFICE SQUARE.

BOSTON, April 4, 1892.

METROPOLITAN METER COMPANY, BOSTON, MASS. :

Gentlemen:—I have recently had occasion to make use of one of your Water Meters for measuring hot water, and I am pleased to give you an account of the success obtained by its use. The question frequently arises concerning the quantity of steam consumed for heating or for mechanical purposes, and it is oftentimes desirable to obtain a continuous record of the amount of steam or the water of condensation which is used.

A few months ago I was requested by the Campbell Machine Company, of Pawtucket, R. I., to arrange something of this kind for recording the quantity of steam used by one of their tenants, and I called upon a number of standard Water Meter manufacturers to obtain, if possible, a Meter that would answer the purpose. I was given but very little assurance that a Meter would work satisfactorily under such circumstances on account of the high and varying temperature and the condition of the water which an instrument would be obliged to meet in the service. None of the makers would guarantee that their Meter would be reliable for such work. A trial was made with one form of Meter which was especially designed for hot water and well recommended for such purpose, but we were unable to obtain any satisfaction whatever from its use.

We then made a trial of one of the Metropolitan Meters, and this has been in almost constant service for the past eight months, giving excellent satisfaction. After a short service a test was made of the accuracy of the Meter by weighing the water as it passed from the Meter. The temperature of the water at this time was at or about 200° Farenheit for every cubic foot of water passed by the Meter, the average weight was found to be 60 pounds. As the weight of a cubic foot of water at this temperature is 59·8 pounds, it is evident that the Meter was working very accurately in this service.

The Meter works very smoothly without any jar or noise, and from all appearances it will give an efficient service for a long time. I am pleased to have found a Meter which can safely be used for measuring hot water, and I shall recommend them for all such service in the future.

Very truly yours,

F. H. CRANE,
Engineer, Emerson Power Scale Company.

CAMPBELL MACHINE COMPANY.

PAWTUCKET, R. I., Nov. 15, 1892.

METROPOLITAN METER COMPANY, BOSTON, MASS. :

Gentlemen,— We hope you will kindly excuse our delay in replying to your favor of October 31st. As we have finished the test for which you kindly placed your machine at our disposal, and are not likely to have any further use for it, we accept, with many thanks, your kind permission to return it to you.

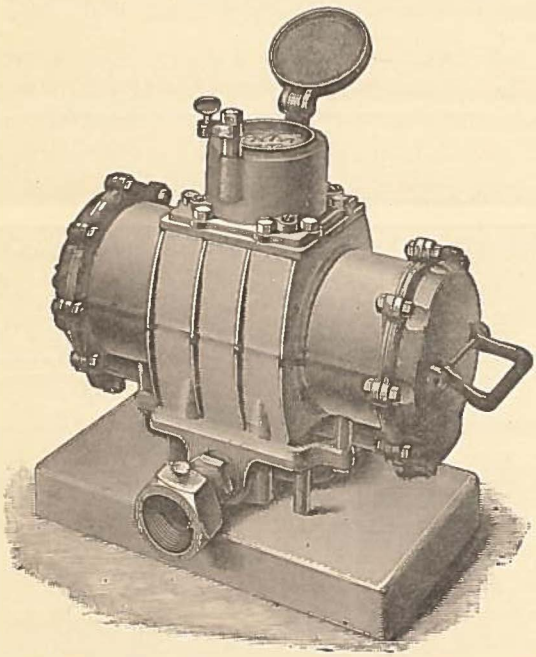
In doing so we desire to express our unqualified approval of this Meter. The test to which we applied it was, we think, an unusual one, that of measuring hot water, but the result proved the absolute accuracy of your machine. We kept it in continuous operation for several months, and in order to test its accuracy, very carefully weighed the water that came through it, with the result as we have said, that the Meter did its work with absolute correctness. We are glad to bear this testimony to the merit of your machine, which we shall be glad to recommend unreservedly to any person looking for a thoroughly reliable and trustworthy Water Meter.

Very truly yours,

CAMPBELL MACHINE COMPANY,

D. MCNIVEN, *General Manager*.

METROPOLITAN BREWERY AND DISTILLERY METER.



These Meters are made of composition metal throughout, in principle and character the same as all METROPOLITAN METERS ; are mounted upon a wood base with or without casters, with strong handles to ends of cylinder for convenience in moving about.

The clock, or index, is adjusted to register BARRELS of any given weight required. (For beer two hundred and fifty-eight pounds.) Capacity of clock registration, 1,000 barrels ; the clock dial being made of metal, and enclosed in extra heavy cage with cover, will withstand rough usage without breakage. These Meters are tapped for one and one-half inch size connections, larger sizes made to order. Brass connections and unions furnished with Meters if desired.

These Meters are warranted to give perfect satisfaction in all BREWERY and DISTILLERY requirements.

TESTIMONIALS OF WORTH OF METROPOLITAN BREWERY METERS.

NORFOLK BREWERY,

HABICH & CO., CORNER CEDAR AND PYNCHON STREETS.

BOSTON, Feb. 1, 1893.

METROPOLITAN METER COMPANY, BOSTON, MASS.:

Gentlemen,—In response to your request, we take pleasure to say that your Meter placed in our brewery one year ago gives full satisfaction, being used continually for hot and cold liquids, and will stand all cleaning methods. We shall be pleased to recommend the same to the trade.

Respectfully yours,

HABICH & CO.,
By J. ZUNNER, *Superintendent.*

BOSTON, April 4, 1893.

METROPOLITAN METER COMPANY:

Gentlemen,—I deem it a pleasure to testify to the practicability, reliability and general worth of the Metropolitan Beer Meter bought of you in 1892, and placed in our brewery.

The Meter has been in constant use, giving no trouble whatever, proving reliable for all requirements, and is in my opinion the only satisfactory Meter for brewery purposes.

HENRY BELTZER, *Brewer*,
For A. J. HOUGHTON & CO.

WHAT APPEARS IN OFFICIAL RECORDS.

We copy, verbatim, FOUR CONSECUTIVE MONTHS' Water Meter Test Reports (March, April, May and June, 1893). An honest reproduction of each and every Water Meter of every kind that was taken from service, and re-tested for accuracy during that period. Any one of these Reports is a fair specimen of the daily experience of Boston with Water Meters for years past. All other Cities and Towns using Water Meters, WILL RECORD PRECISELY THE SAME RRSULTS, if adopting the SAME methods.

In order that loss or gain in delivery of water — through duty performed by many of the Meters shown in the several Reports—may be a basis for comparison, we have searched past Reports and set against the respective Meters, the accuracy test when last set at service. A careful perusal of comparative showings proves conclusively the SUPERIORITY in SERVICE of the PISTON TYPE OF METER. Here are facts indisputable. Occasionally, here and there appears a creditable Rotary record; but taken all in all, WHAT A RECORD THEY PRESENT. The same story is told in Boston City Documents Nos. 136, 138, 154, 155, 166, 195 and 208 for the year 1890; also, Nos. 5, 44, 62, 85, 99, 114, 122, 135, 151, 164 and 171 for the year 1891, and in each monthly Water Meter Test Report throughout 1892 and 1893.

If here is not PROOF SUFFICIENT of the worth or worthlessness of the respective types of Water Meters, where are we to look for more CONVINCING EVIDENCE? A mere glance at the respective test showings gives one an idea in pounds or percentage of loss of water to the city. Not until one dives into figures and calculations can justice be done the subject, or a realization of the ENORMOUS LOSS OF REVENUE, be obtained. Here are matters worthy of consideration, and abundance of material for those mathematically inclined.

A SIMPLE STATEMENT OF FACTS.

Figuring up the aggregate quantity of water over-delivered against the Meter clocks of the respective Meters, as recorded in the above cited four months' re-tests, favoring each individual Meter with a liberal percentage of allowance against their bad showing of inaccuracy, it appears, that could the City of Boston have received the value of the water OVER-DELIVERED through such defective Meters, at current Meter rates, such money would not only have PAID for the 415 VARIOUS SIZE NEW WATER METERS purchased in 1892, also the COST of SETTING same; but LIKEWISE would have gone a long way towards the cost of REPAIRS upon the 1,951 OTHER METERS taken from service during 1892. THIS THE SHOWING OF FOUR MONTHS ONLY. Query? DOES IT PAY to introduce a simple business-like system in the handling of Water Meters, and rigidly follow it up?

With such a loss of revenue as shown in four months upon re-tests of 581 Meters, what must be the constant and increasing loss of revenue to Water Departments using Water Meters where little or no attention is paid to same until they wear out in service?

FROM WATER METER TEST REPORTS OF THE WATER DEPARTMENT, CITY OF BOSTON, MASS.

All such Meters when previously set at service, having been adjusted within two (2) per cent. of accuracy, in favor of the consumer, *i.e.*, 625 to 637 pounds weight of water as an equivalent for ten (10) cubic feet measurement.

10 cubic feet indicates 625 lbs., 5 cubic feet indicates 312·5 lbs., 2 cubic feet indicates 125 lbs.

Report of all Water Meters taken out of Service during the month of March, 1893.

Date of Test.	Size of Meter.	Style of Meter.	No. of Meter.	Weight of Water Delivered Through Meter with Outlets of Different Diameters.								Register of Meter Cubic Feet.	Remarks. Reason for Test or Cause of Trouble.
				2 in. Outlet 20 c. ft. Registered.	1½ in. Outlet. 20 c. ft. Registered.	1 in. Outlet. 10 c. ft. Registered.	¾ in. Outlet. 10 c. ft. Registered.	⅝ in. Outlet. 10 c. ft. Registered.	½ in. Outlet. 10 c. ft. Registered.	½ in. Outlet. 5 c. ft. Registered.	½ in. Outlet. 2 c. ft. Registered.		
March 1	⅝ inch	Crown.....	35459	.....	.....	.....	.....	.....	.....	.....	.....	9,497	Don't register. Intermediate gear broken.
" 1	¾ "	Worthington.	24650	.....	.....	.....	622	.....	653	.....	.....	6,493	Don't register. Driving spindle worn.
" 1	1½ "	Worthington.	31116	.....	1280	637	.....	.....	622	307·5	124	2,100,822	Taken out for test.
" 1	1 "	Worthington.	23797	.....	.....	637	.....	.....	612	300	102	299,324	Taken out for test.
" 2	1½ "	Hersey.....	14544	.....	1246	627	.....	.....	625	313·5	180	542,381	Telephone report, leaking.
" 3	1 "	Worthington.	0	.....	.....	615	.....	.....	617	293·5	117	9,662	Taken out for test.
" 3	1 "	Worthington.	5538	.....	.....	647	.....	.....	634	310	122	12	Don't register. Clock detached.
" 3	¾ "	B. W. W....	341	.....	.....	.....	642	.....	634	302·5	120	83,853	Telephone report, no force.
" 3	¾ "	Am. Frost....	14	.....	.....	.....	634	.....	615	320	146	4,706	Discontinued.
" 4	¾ "	B. W. W....	361	.....	.....	.....	618	.....	612	295	110	72,232	Don't register.
" 4	⅝ "	Crown.....	11077	.....	.....	.....	.....	651	.....	318·5	122	8,784	Don't register.
" 4	⅝ "	Crown.....	12147	.....	.....	.....	.....	976	.....	.....	.....	6,246	Don't register. Injured by frost.
" 4	⅝ "	Crown.....	11193	.....	.....	.....	.....	651	.....	318	125	28,246	Don't register.
" 4	⅝ "	Worthington..	2547	.....	.....	.....	.....	765	.....	383·5	.....	44,460	Don't register. Piston worn.
" 7	1 "	Worthington..	0069	.....	.....	588	.....	.....	580	274	106	403,994	Don't register.
" 7	⅝ "	Worthington.	2097	.....	.....	.....	.....	667	.....	327	127	94,422	Clock broken.
" 7	1 "	Crown.....	35939	.....	.....	643	.....	.....	638	321	125	180,476	Discontinued.
" 7	⅝ "	Crown.....	34606	.....	.....	.....	.....	648	.....	312·5	123	80	Discontinued.
" 9	¾ "	B. W. W.....	537	.....	.....	.....	651	.....	626	308·5	122	23,513	Telephone report, no force.
" 9	1 "	Worthington..	2613	.....	.....	.....	.....	.....	.....	.....	.....	115,826	Injured by frost.
" 9	1 "	Worthington..	39828	.....	.....	.....	.....	.....	.....	.....	.....	21,756	Injured by frost.
" 10	1 "	Crown.....	11319	.....	.....	625	.....	.....	621	312·5	125	89,347	Taken out for test.
" 11	⅝ "	Crown.....	13122	.....	.....	.....	.....	680	.....	325·5	126	74,746	Don't register.
" 11	¾ "	B. W. W.....	418	.....	.....	.....	.....	.....	.....	.....	.....	10,299	Meter filled with rust.
" 13	¾ "	Crown	104694	.....	.....	.....	642	.....	646	315	127	3,112	Don't register.

March	13	¾	inch	Crown	104705	.....	.....	.....	630	.....	637	314	126	694	Don't register. Gearing unmeshed.
"	13	1	"	Crown	12612	.....	.....	.....	.....	.....	.....	.....	.....	453,589	Don't register. Piston broken.
"	13	⅝	"	Crown	9764	.....	.....	.....	.....	661	.....	338	132	48,130	Taken out for test.
"	13	⅝	"	Crown	13031	.....	.....	.....	.....	657	.....	320·5	126	66,903	Taken out for test.
"	13	¾	"	Crown	101929	.....	.....	.....	639	.....	639	311·5	125	58,552	Discontinued.
"	13	¾	"	Metropolitan	406	.....	.....	.....	630	.....	626	310·5	126	1,019	Discontinued.
"	13	⅝	"	Crown	9718	.....	.....	.....	.....	653	.....	320	125	97,623	Taken out for test.
"	13	⅝	"	Crown	43152	.....	.....	.....	.....	649	.....	327·5	128	74.230	Taken out for test.
"	13	1	"	Worthington	38101	.....	.....	622	.....	.....	612	300	122	148,792	Don't register.
"	13	⅝	"	Crown	38820	.....	.....	.....	.....	.....	.....	.....	.....	17,702	Injured by frost.
"	13	⅝	"	Worthington	25919	.....	.....	.....	.....	648	.....	215	120	20	Don't register. Clock broken.
"	14	1	"	Worthington	25641	.....	.....	617	.....	.....	609	311	.....	517,835	Taken out for test.
"	14	⅝	"	Worthington	24441	.....	.....	.....	.....	616	.....	301	110	11,280	Taken out for test.
"	14	⅝	"	Crown	10246	.....	.....	.....	.....	671	.....	326·5	126	34,398	Taken out for test.
"	14	⅝	"	Crown	11073	.....	.....	.....	.....	625	.....	312·5	125	73,086	Discontinued.
"	15	¾	"	Hersey	1571	.....	.....	.....	600	.....	594	304	116	128,347	Don't register.
"	15	⅝	"	Crown	9768	.....	.....	.....	.....	655	.....	320·5	124	27,627	Taken out for test.
"	15	⅝	"	Crown	10285	.....	.....	.....	.....	.....	.....	.....	.....	5,741	Injured by hot water.
"	15	1	"	Crown	34822	.....	.....	642	.....	.....	635	314·5	128	735,084	Don't register.
"	15	1	"	Worthington	7203	.....	.....	630	.....	.....	623	305	.....	1,089	Unsatisfactory, valves out of place.
"	15	¾	"	B. W. W.	101	.....	.....	.....	741	.....	778	390	636	24,635	Don't register. Packing blown.
"	15	¾	"	B. W. W.	591	.....	.....	.....	622	.....	616	300	116	49,966	Discontinued.
"	15	¾	"	B. W. W.	263	.....	.....	.....	.....	.....	.....	.....	.....	5,902	Clock broken. Meter filled with rust.
"	16	⅝	"	Crown	10241	.....	.....	.....	.....	632	.....	325	127	95,770	Taken out for test.
"	16	⅝	"	Crown	9732	.....	.....	.....	.....	639	.....	312·5	120	44,567	Taken out for test.
"	16	¾	"	B. W. W.	411	.....	.....	.....	.....	.....	.....	.....	.....	69,211	Tel. report, no force. Meter filled with rust.
"	16	⅝	"	Worthington	1621	.....	.....	.....	.....	640	.....	306	116	21	Don't register.
"	16	¾	"	Hersey	13318	.....	.....	.....	607	.....	600	300	120	237,418	Don't register.
"	16	¾	"	Crown	11728	.....	.....	.....	661	.....	636	306·5	132	34	Don't register.
"	16	¾	"	Crown	7782	.....	.....	.....	662	.....	664	322	148	311,532	Taken out for test.
"	18	¾	"	Metropolitan	142	.....	.....	.....	629	.....	625	310·5	126	128,636	Clock defaced. (Last test Dec. 3, 1891–629 lbs.)
"	18	¾	"	Crown	69080	.....	.....	.....	636	.....	634	320	126	38,409	Building burned.
"	18	⅝	"	Crown	10204	.....	.....	.....	.....	690	.....	335	129	46,206	Taken out for test.
"	18	⅝	"	Crown	40487	.....	.....	.....	.....	665	.....	335	134	17,413	Taken out for test.
"	18	⅝	"	Crown	9781	.....	.....	.....	.....	726	.....	306	136	53,581	Taken out for test.
"	18	⅝	"	Crown	69052	.....	.....	.....	.....	651	.....	320·5	126	90,158	Taken out for test.
"	18	⅝	"	Crown	9736	.....	.....	.....	.....	650	.....	317·5	125	92,543	Taken out for test.
"	18	⅝	"	Crown	12949	.....	.....	.....	.....	639	.....	310	118	11,691	Taken out for test.
"	18	⅝	"	Crown	9746	.....	.....	.....	.....	675	.....	340	132	6,849	Taken out for test.
"	18	⅝	"	Crown	11266	.....	.....	.....	.....	660	.....	325	123	68,315	Taken out for test.
"	20	⅝	"	Crown	11745	.....	.....	.....	.....	.....	.....	.....	.....	460	Don't register. Injured by hot water.
"	20	⅝	"	Crown	11753	.....	.....	.....	.....	640	.....	310	120	2,380	Don't register.
"	20	⅝	"	Crown	9699	.....	.....	.....	.....	652	.....	315	122	91,950	Telephone report, leaking.

Report of all Water Meters taken out of Service during the month of March, 1893.—Continued.

Date of Test.	Size of Meter.	Style of Meter.	No. of Meter.	Weight of Water Delivered Through Meter with Outlets of Different Diameters.							Register of Meter Cubic Feet.	Remarks. Reason for Test or Cause of Trouble.
				2 in. Outlet. 20 c. ft. Registered.	1½ in. Outlet. 20 c. ft. Registered.	1 in. Outlet. 10 c. ft. Registered.	¾ in. Outlet. 10 c. ft. Registered.	⅝ in. Outlet. 10 c. ft. Registered.	½ in. Outlet. 10 c. ft. Registered.	½ in. Outlet. 5 c. ft. Registered.	¼ in. Outlet. 2 c. ft. Registered.	
March 20	⅝ inch	Crown.....	10242	.....	.....	.....	.....	625	.....	300	122	60,383	Don't register.
" 20	1½ "	Crown.....	97742	.....	1286	648	.....	.....	625	313·5	123	105,652	Don't register.
" 20	1 "	Worthington.	3037	.....	.....	632	.....	.....	623	291	115	7,604	Telephone report, leaking.
" 20	1 "	Worthington.	37673	.....	.....	.....	.....	.....	.....	.....	.....	281,819	Don't register. Meter filled with rust.
" 20	1 "	Worthington.	38734	.....	.....	673	.....	.....	665	312.5	124	837,080	Taken out for test.
" 21	½ "	B W. W.	157	.....	.....	.....	617	.....	612	298·5	114	56,050	Don't register.
" 21	¾ "	B. W. W.	124	.....	.....	.....	645	.....	634	314	116	32,184	Discontinued.
" 21	¾ "	B. W. W.	594	.....	.....	.....	.....	.....	.....	.....	.....	19,164	Don't register. Meter filled with rust.
" 21	⅝ "	Metropolitan..	362	.....	.....	.....	627	.....	625	311·5	125	516,642	Taken out for test. (Last test May 28, 1892–625 lb.)
" 22	⅝ "	Crown.....	10265	.....	.....	.....	.....	.....	.....	.....	.....	4,918	Telephone report, no force. Solder in Meter.
" 22	⅝ "	Metropolitan..	360	.....	.....	.....	629	.....	624	310·5	125	53,860	Discontinued.
" 22	⅝ "	Worthington.	23405	.....	.....	.....	.....	.....	.....	.....	.....	18,326	Injured by frost.
" 23	1 "	Worthington..	11302	.....	.....	718	.....	.....	713	328	125	886,952	Taken out for test.
" 23	½ "	B. W. W.	148	.....	.....	.....	804	.....	.....	.....	.....	243,023	Taken out for test. Rust in Meter.
" 23	⅝ "	Crown.....	7006	.....	.....	.....	.....	606	.....	303	121	43,570	Don't register. Intermediate gear worn.
" 24	¾ "	Worthington.	37299	.....	.....	.....	838	.....	810	365	152	344,080	Taken out for test.
" 24	1 "	Worthington.	35907	.....	.....	616	.....	.....	612	298·5	119	61,303	Taken out for test.
" 24	⅝ "	Crown.....	10365	.....	.....	.....	.....	.....	.....	.....	.....	7,790	Don't register. Solder in Meter.
" 24	⅝ "	Crown.....	10272	.....	.....	.....	.....	630	.....	312·5	125	72,747	Discontinued.
" 24	⅝ "	Crown.....	10361	.....	.....	.....	.....	653	.....	322	127	54,899	Discontinued.
" 24	⅝ "	Crown.....	69060	.....	.....	.....	.....	659	.....	320	127	18,222	Telephone report, stoppage.
" 24	⅝ "	Crown.....	66975	.....	.....	.....	.....	649	.....	320	125	35,081	Don't register.
" 24	⅝ "	Crown.....	67006	.....	.....	.....	.....	623	.....	309·5	123	33,395	Don't register.
" 24	¾ "	Thomson.....	4757	.....	.....	.....	.....	.....	.....	.....	.....	46,245	Don't register. Gear worn.
" 24	1 "	Crown.....	10153	.....	.....	665	.....	.....	660	328	127	65,922	Unsatisfactory.
" 24	¾ "	Hersey.....	1560	.....	.....	.....	580	.....	578	286	112	771,745	Taken out for test.
" 27	⅝ "	Metropolitan..	464	.....	.....	.....	630	.....	628	311·5	123	7,388	Leak in Meter.
" 27	⅝ "	Crown.....	12982	.....	.....	.....	.....	625	.....	308·5	120	67,809	Clock defaced.
" 27	¾ "	Worthington.	24357	.....	.....	.....	644	.....	644	309	124	90,300	Don't register.
" 27	¾ "	Worthington.	38720	.....	.....	.....	630	.....	637	307	118	297.031	Don't register.
" 27	⅝ "	Crown.....	35758	.....	.....	.....	.....	730	.....	345	124	66,710	Taken out for test.
" 27	1 "	Crown.....	5704	.....	.....	631	.....	.....	625	298·5	115	3,712	Telephone report, stoppage.

March	28	1½ inch	Crown.....	37691	.....	1290	638	.....	.....	635	307·5	119	1,005,012	Telephone report, leaking.
"	28	¾ "	Worthington.	38513	.....	.....	.....	619	.....	613	298	106	42,791	Telephone report, no force.
"	28	⅝ "	Crown.....	12031	.....	.....	.....	.....	651	.....	316·5	121	15,150	Taken out for test.
"	28	⅝ "	Crown.....	6975	.....	.....	.....	.....	779	.....	350	146	75,871	Taken out for test.
"	28	⅝ "	Crown.....	38813	.....	.....	.....	.....	673	.....	326·5	125	64,048	Don't register.
"	28	⅝ "	Crown.....	10376	.....	.....	.....	.....	645	.....	312·5	125	91,120	Taken out for test.
"	28	⅝ "	Crown.....	30475	.....	.....	.....	.....	655	.....	317 5	126	2,817	Discontinued.
"	28	¾ "	Worthington.	37791	.....	.....	.....	662	.....	655	319	128	578,701	Don't register.
"	28	¾ "	Worthington.	24652	.....	.....	.....	665	.....	630	290	108	60,160	Don't register.
"	30	1 "	Metropolitan.	512	.....	.....	.....	628	.....	627	312·5	126	57,225	Leak at spindle.
"	30	⅝ "	Crown.....	9798	.....	.....	.....	.....	.....	.....	.....	.....	47,614	Don't register. Injured by hot water.
"	30	⅝ "	Crown.....	12996	.....	.....	.....	.....	.....	.....	.....	.....	7,778	Don't register. Injured by hot water.
"	30	⅝ "	Crown.....	10231	....	.....	.....	.....	612	.....	300·5	119	47,404	Taken out for test.
"	31	⅝ "	Crown.....	6511	.....	.....	.....	.....	747	.....	332·5	130	66,376	Clock defaced.
"	31	⅝ "	Crown.....	11201	.....	....	.....	.....	683	.....	333	126	47,405	Clock defaced.
"	31	¾ "	B. W. W....	561	.....	.....	.....	.....	.....	.....	.....	.....	82,546	Don't register. Meter filled with rust.
"	31	¾ "	B. W. W....	350	.....	.....	.....	.....	.....	.....	.....	.....	.....	Don't register. Meter filled with rust.
"	31	¾ "	Worthington.	75074	.....	.....	.....	626	.....	620	305	118	3,640	Discontinued.
"	31	2 "	Worthington.	1811	1273	.....	630	.....	... .	610	286·5	116	31,330	Service decreased.

DO NOT STOP HERE, ANALYZE THE FOLLOWING THREE MONTHS' METER TESTS.

Assuming that you have looked through the above recorded Meter Tests of the Boston Water Department for the month of March, 1893, it is fair to suppose that an impression has been made, and we trust that an interest is created to encourage your devoting time and patience to likewise peruse carefully the following Meter Test Reports of the months of April, May and June, 1893; particularly those of May and June, which show hundreds of Meters taken out of service for purpose of re-test.

This is a matter of repetition of history, monthly throughout past years, with the Boston Water Department; showing conclusively that there has been no change from year to year in the character of the several make of Meters.

Analyze these FOUR CONSECUTIVE MONTHS' Meter Test Reports. Also the RECAPITULATION of Boston's experience of 1890, '91, '92 and '93, pages 56 to 59, also the several individual record of Meters on pages 60 to 66 in support of our assertion, that SOME makes of Meters DO register AGAINST the consumer; and perhaps you get an idea or two, worth something to you in your official capacity hereafter.

REPORT OF ALL WATER METERS TAKEN OUT OF SERVICE DURING THE MONTH OF APRIL, 1893.

Date of Test.	Size of Meter.	Style of Meter.	No. of Meter.	Weight of Water Delivered Through Meter with Outlets of Different Diameters.								Register of Meter Cubic Feet.	Remarks. Reason for Test or Cause of Trouble.
				2 in. Outlet. 20 c. ft. Registered.	1½ in. Outlet. 20 c. ft. Registered.	1 in. Outlet. 10 c. ft. Registered.	¾ in. Outlet. 10 c. ft. Registered.	⅝ in. Outlet. 10 c. ft. Registered.	½ in. Outlet. 10 c. ft. Registered.	½ in. Outlet. 6 c. ft. Registered.	⅜ in. Outlet. 2 c. ft. Registered.		
April 3	2 inch	Worthington.	18350	1206	.....	610	....	.....	607	.....	.....	326,320	Size decreased; would not register on ½ in outlet.
" 3	¾ "	Worthington.	24638	.....	.....	.....	636	.....	627	302	116	17,860	Taken out for test. (Last test Dec. 2, '91–639 lbs.)
" 3	1 "	Metropolitan.	523	.....	.....	.....	.....	.....	.....	.....	.....	324,878	Driving pawl broken.
" 3	1 "	Worthington.	2586	.....	.....	655	.....	.....	646	300	120	320,527	Telephone report, no force.
" 3	⅝ "	Crown.....	40479	.....	.....	.....	.....	697	.....	.....	.....	46,418	Don't register. Piston worn.
" 3	⅝ "	Thomson.....	11037	.....	.....	.....	.....	611	.....	303·5	118	93,881	Enlargem't of ser. (Last test Feb. 13, '91–625 lbs.)
" 3	¾ "	Metropolitan	123	.....	.....	.....	625	.....	620	311·5	126	15,723	Tel. rep., leak in Meter. (Last test Jan. 20, '93–631.)
" 3	⅝ "	Crown.....	11110	.....	.....	.....	.....	625	.....	310	124	43	Don't register.
" 5	⅝ "	Crown.....	10231	.....	.....	.....	.....	659	.....	320·5	126	46,578	Taken out for test.
" 5	⅝ "	Crown.....	9784	.....	.....	.....	.....	631	.....	308·5	118	341	Enlargement of service.
" 5	⅝ "	Crown.....	12144	.....	.....	.....	.....	630	.....	308·5	125	59,674	Telephone report, no force.
" 5	¾ "	Crown.....	66954	.....	.....	.....	634	.....	628	314·5	125	55,891	Enlargem't of Ser. (Last test Apr. 1, '92–637 lbs.)
" 5	¾ "	Crown.....	34837	.....	.....	.....	634	.....	631	306	128	42.181	Discontinued.
" 5	1 "	Worthington.	7219	.....	.....	637	.....	.....	630	301·5	120	147,790	Change location.
" 7	¾ "	Worthington.	75074	.....	.....	.....	622	.....	617	303·5	120	22	Telephone report, no force.
" 7	¾ "	Worthington.	38632	.....	.....	.....	628	.....	623	303·5	116	90.770	Don't register. (Last test May 9, '91–632 lbs.)
" 7	¾ "	Metropolitan.	129	.....	.....	.....	630	.....	625	312·5	124	152,520	Tel. rep., leaking. (Last test Sept. 27, '91–629 lbs.)
" 7	¾ "	Metropolitan.	163	.....	.....	.....	625	.....	623	312·5	123	63.181	Tel. report, leaking. (Last test Sept. 25, '91–628 lb)
" 7	⅝ "	Crown.....	40468	.....	.....	.....	873	.....	855	407·5	170	59,912	Injured by hot water.
" 10	⅝ "	Crown.....	10363	.....	.....	.....	.....	625	.....	310	124	23,997	Don't register. (Last test Sept. 13, '92–633 lbs.)
" 10	3 "	Crown.....	8767	1326	.....	632	.....	.....	646	319·5	.....	2,190,650	Don't reg. Interm. gear broken. (Test after rep.)
" 10	1 "	Worthington.	11577	.....	.....	601	.....	.....	586	283·5	106	46,083	Taken out for test.
" 10	1½ "	Worthington.	8235	.....	1276	638	.....	.....	637	309·5	125	93,632	Meter from Jamaica Plain service.
" 11	1 "	Worthington.	1704	.....	.....	617	.....	.....	602	295	110	50,009	Don't register. (Last test Jan. 5, '87–625 lbs.)
" 11	⅝ "	Crown.....	12053	.....	.....	.....	.....	643	.....	322·5	126	99,524	Telephone report, no force.
" 11	⅝ "	Crown.....	37213	.....	.....	.....	.....	608	.....	300	118	71,600	Reported leaking. (Last test Apr. 22, '92–630 lbs.)
" 11	⅝ "	Crown.....	33287	.....	.....	.....	.....	655	.....	323·5	126	39,080	Clock broken.
" 12	1 "	Worthington.	5077	.....	.....	684	.....	.....	692	333	146	33,305	Don't register.
" 13	⅝ "	Worthington.	25785	.....	.....	.....	.....	638	.....	305	116	10,373	Don't register.
" 13	⅝ "	Crown.....	11223	.....	.....	.....	.....	635	.....	314·5	123	8,137	Discontinued.
" 13	⅝ "	Crown.....	69035	....	.....	.....	.....	644	.....	315·5	125	53,438	Discontinued.
" 13	1 "	Hersey.....	12400	.....	.....	1062	.....	.....	.....	.....	.....	608,635	Injured by hot water.

April	13	1	inch	Worthington.	1113	.....	.....	612	.....	.....	604	295	112	56,348	Tel. report, leak'g. (Last test Apr. 5, '87–625 lbs.)
"	13	1½	"	Worthington.	37688	.....	1308	651	.....	.....	631	306·5	120	788,050	By order of Water Registrar. No force.
"	13	⅝	"	Crown.....	38813	.....	.....	.....	.....	623	.....	305	116	17	Don't register.
"	13	⅝	"	Crown.....	13031	.....	.....	.....	.....	625	.....	305	120	2,277	Telephone report, Meter out of order.
"	13	⅝	"	Crown.....	12992	.....	.....	.....	.....	743	.....	407·5	144	30,052	Telephone report, no force.
"	14	¾	"	B. W. W.....	479	.....	.....	.....	744	.....	706	322·5	126	11,581	Don't register.
"	14	¾	"	Worthington.	37796	.....	.....	.....	625	.....	602	305 5	120	11,260	Don't Register. (Last test Oct. 24, '92–626 lbs.)
"	14	3	"	Crown.....	81923	1502	.....	1470	.....	.....	687	323·5	.....	398,220	Telephone report, frost in Meter.
"	15	1½	"	Crown.....	23583	.....	1275	625	.....	.....	620	291·5	126	21,085	Hands of clock loose.
"	17	⅝	"	Crown.....	6888	.....	.....	.....	.....	625	.....	300	116	10,403	Don't register.
"	19	¾	"	Metropolitan.	172	.....	.....	.....	630	.....	625	312·5	126	56,212	Don't register. (Last test Sept. 25, '91–625 lbs.)
"	19	⅝	"	Crown.....	6968	.....	.....	.....	.....	.....	.....	.....	.....	35,076	Don't register. Injured by hot water.
"	19	⅝	"	Crown.....	65221	.....	.....	.....	.....	633	.....	307·5	118	91,517	Don't register. (Last test Dec. 18, '90-625 lbs.)
"	19	⅝	"	Crown.....	33300	.....	.....	.....	.....	625	.....	304	124	06,595	Clock broken.
"	19	⅝	"	Crown.....	66999	.....	.....	.....	.....	649	.....	328 5	126	1,224	Taken out for test. (Last test Sept. 26,'90–625 lbs.)
"	20	⅝	"	Crown.....	66969	.....	.....	.....	.....	679	.....	336	130	2,114	Taken out for test.
"	20	⅝	"	Crown.....	69051	.....	.....	.....	.....	715	.....	347·5	135	93,020	Unsatisfactory. Gearing did not work.
"	20	1	"	Worthington.	17424	.....	.....	629	.....	.....	620	300	116	52,632	Change of location.
"	20	¾	"	B. W. W.....	362	.....	.....	.....	694	.....	.....	.....	.....	8,649	Taken out for test. Rust in Meter.
"	20	¾	"	Worthington.	35757	.....	.....	.....	.....	625	.....	303·5	126	65,641	Taken out for test.
"	21	¾	"	Desper.....	2606	.....	.....	.....	649	.....	644	314·5	125	61.357	Taken out for test.
"	21	1	"	Worthington.	37781	.....	.....	.....	799	.....	792	370	127	368.258	Taken out for test.
"	21	⅝	"	Crown.....	34032	.....	.....	.....	.....	649	.....	319	124	0,801	Clock defaced.
"	21	1	"	Metropolitan	541	.....	.....	632	.....	.....	627	311·5	127	44 264	Tel. rep., leaking. (Last test June 23, '92–626 lbs.)
"	21	1	"	Metropolitan.	568	.....	.....	630	.....	.....	625	313 5	127	45.665	Tel. rep., leaking. (Last test Nov. 4, '92–627 lbs.)
"	21	¾	"	Hersey... ...	1567	.....	.....	.....	607	.....	604	301	118	347,246	Taken out for test. (Last test Aug. 5,'91–632 lbs.)
"	21	1	"	Hersey.....	6036	.....	.....	604	.....	.....	594	298	117	755,564	Taken out for test. (Last test Apr. 26, '89–626 lbs.)
"	21	1	"	Crown.....	10159	.....	.....	682	.....	.....	657	340	128	18,454	Taken out for test.
"	22	1	"	Crown.....	74575	.....	.....	640	.....	.....	635	319	126	852,435	Taken out for test.
"	22	1	"	Crown.....	33489	.....	.....	901	.....	.....	853	353·5	187	900,922	Taken out for test.
"	22	⅝	"	Crown.....	10367	.....	.....	.....	.....	687	.....	337·5	136	35,252	Telephone report, no force. Fish in Meter.
"	22	¾	"	Hersey.....	1555	.....	.....	.....	768	.....	780	396	136	171,640	Taken out for test. Found injured by hot water.
"	22	¾	"	B. W. W.....	8	.....	.....	.....	636	.....	624	303 5	120	235	Clock broken.
"	24	¾	"	Worthington.	2024	.....	.....	.....	.....	685	.....	321·5	128	85,225	Taken out for test.
"	24	¾	"	B. W. W.....	146	.....	.....	.....	.....	.....	.....	.....	.....	336,213	Taken out for test. Meter filled with rust.
"	24	1	"	B. W. W.....	223	.....	.....	.....	665	.....	.....	.....	.....	46,711	Taken out for test. Rust in Meter.
"	24	⅝	"	Crown.....	35468	.....	.....	.....	.....	633	.....	315	124	00,003	Clock broken.
"	24	⅝	"	Crown.....	11213	.....	.....	.....	.....	628	.....	312·5	123	69,119	Taken out for test.
"	24	⅝	"	Crown.....	10337	.....	.....	.....	.....	651	.....	325·5	131	17.012	Taken out for test.
"	24	⅝	"	Crown.....	11132	.....	.....	.....	.....	638	.....	317 5	125	36 489	Taken out for test.
"	24	⅝	"	Crown.....	34007	.....	.....	.....	715	.....	690	336	132	664.722	Taken out for test.
"	25	¾	"	B. W. W.....	508	.....	.....	.....	698	.....	.....	.....	.....	56,340	Taken out for test.
"	25	1	"	Worthington.	37979	.....	.....	651	.....	.....	632	313·5	124	29,481	Taken out for test.

Report of all Water Meters taken out of Service during the month of April, 1893.—Continued.

Date of Test.	Size of Meter.	Style of Meter.	No. of Meter.	Weight of Water Delivered Through Meter with Outlets of Different Diameters.								Register of Meter Cubic Feet.	Remarks. Reason for Test or Cause of Trouble.
				2 in. Outlet. 20 c. ft. Registered.	1½ in. Outlet. 20 c. ft. Registered	1 in. Outlet. 10 c. ft. Registered.	¾ in. Outlet. 10 c. ft. Registered.	⅝ in. Outlet. 10 c. ft. Registered.	½ in. Outlet. 10 c. ft. Registered.	½ in. Outlet. 5 c. ft. Registered.	⅜ in. Outlet. 2 c. ft. Registered.		
April 25	1 inch	Worthington.	2591	.....	.....	660	.....	.....	660	315	126	87,390	Taken out for test.
" 26	2 "	Worthington.	24232	1291	.....	633	.....	.....	619	305	143	25	Don't register.
" 26	1½ "	Crown.....	28275	....	1240	623	.....	.....	612	296·5	120	184,860	Don't register.
" 26	1 "	Worthington.	1613	.....	.....	.....	.....	.....	.....	.....	.....	44,853	Taken out for test. Filled with rust.
" 26	¾ "	Crown.....	7787	.....	.....	.....	718	.....	711	325	142	325,433	Taken out for test.
" 26	¾ "	Metropolitan..	11	.....	.....	.....	628	.....	625	310·5	125	326,837	Taken out for test. (Last test Mar. 10, '91–631 lbs.)
" 26	¾ "	Metropolitan..	12	.....	.....	.....	628	.....	624	309·5	124	295,672	Taken out for test. (Last test Feb. 28, '90–623 lbs.)
" 26	¾ "	Hersey.....	4472	.....	.....	.....	.....	574	.....	289	115	67,562	Taken out for test. (Last test Mar. 12, '89–625 lbs.)
" 26	¾ "	Crown.....	12958	.....	.....	.....	.....	637	.....	312·5	123	4,039	Taken out for test.
" 26	¾ "	Crown.....	37198	.....	.....	.....	.....	678	.....	330	127	32,171	Taken out for test.
" 26	¾ "	Crown.....	6873	.....	.....	.....	.....	689	.....	332·5	127	74,434	Taken out for test.
" 27	¾ "	Crown.....	13020	.....	.....	.....	.....	625	.....	300	118	56,356	Clock broken.
" 27	1 "	Crown.....	10175	.....	.....	680	.....	.....	655	319	138	987,481	Taken out for test.
" 27	1 "	Worthington.	1116	.....	.....	627	.....	.....	620	287·5	114	58,433	Meter Stopped. (Last test June 28, '90–633 lbs.)
" 28	1 "	Worthington	5864	.....	.....	616	.....	.....	610	292·5	118	80,341	Taken out for test.
" 28	¾ "	Worthington.	3678	.....	.....	.....	.....	634	.....	312 5	116	13,262	Enlargement of service.
" 28	¾ "	B. W. W.....	407	.....	.....	.....	.....	.....	.....	.....	.....	54,254	Telephone report, no force. Meter filled with rust.
" 28	1 "	Crown.....	7907	.....	.....	673	.....	.....	663	321·5	138	317,141	Taken out for test.
" 28	¾ "	Metropolitan..	490	.....	.....	.....	631	.....	629	312·5	125	2,742	Discontinued. (Last test Mar. 2, '93–629 lbs.)
" 28	¾ "	Crown.....	37194	.....	.....	.....	.....	676	.....	337·5	127	71,106	Taken out for test.
" 29	¾ "	B. W. W.....	209	.....	.....	.....	690	.....	.....	.....	.....	23,348	Telephone report, no force. Rust in Meter.
" 29	1 "	Metropolitan..	569	.....	.....	623	.....	.....	621	307·5	122	5,574	Changed location.
" 29	1 "	Ball & Fitts...	22265	.....	.....	648	.....	.....	650	318	130	84,937	Taken out for test.
" 29	1 "	Worthington..	572	.....	.....	625	.....	.....	620	302	120	29,980	Don't register.
" 29	¾ "	Metropolitan..	197	.....	.....	.....	.....	.....	.....	.....	.....	42,693	Don't register. Pin out of driving pawl.
" 29	1 "	Hersey.....	6044	.....	.....	587	.....	.....	584	293	120	975,944	Taken out for test. (Last test June 16, '89–627 lbs.)
" 29	1 "	Hersey.....	4845	.....	.....	616	.....	.....	618	312·5	128	195,286	Taken out for test. (Last test Jan. 21, '91–639 lbs.)

REMARKS:—Where Meters show any Resemblance to a state of Accuracy, we quote Official Test when set at Service (where obtainable), for comparison.

REPORT OF ALL WATER METERS TAKEN OUT OF SERVICE DURING THE MONTH OF MAY, 1893.

Date of Test.	Size of Meter.	Style of Meter.	No. of Meter.	Weight of Water Delivered Through Meter with Outlets of Different Diameters.								Quantity Registered by Meter Cubic Feet.	Remarks. Reason for Test or Cause of Trouble.
				2 in. Outlet. 20 c. ft. Registered.	1½ in. Outlet. 20 c. ft. Registered.	1 in. Outlet. 10 c. ft. Registered.	¾ in. Outlet. 10 c. ft. Registered.	⅝ in. Outlet. 10 c. ft. Registered.	½ in. Outlet. 10 c. ft. Registered.	¼ in. Outlet. 5 c. ft. Registered.	⅛ in. Outlet. 2 c. ft. Registered.		
May 1	1 inch	Worthington.	39423	.....	.....	649	.....	.....	635	306·5	126	1,171,788	Taken out for test. (Last test Jan. 25, '91–635 lbs.)
" 1	2 "	Crown.....	14293	1260	.....	625	.....	.....	604	299	121	724,124	Change of location.
" 1	1 "	Worthington.	37383	.....	.....	720	.....	.....	690	315	120	278,678	Telephone report, no force.
" 2	¾ "	B. W. W.....	570	.....	.....	.....	.....	.....	.....	.....	.....	51,775	Unsatisfactory, don't register, filled with rust.
" 2	¾ "	B. W. W.....	315	.....	.....	.....	742	.....	.....	.....	.....	61,608	Discontinued.
" 2	⅝ "	Metropolitan..	13	.....	.....	.....	.....	628	.....	311·5	124	274,663	Leak in Meter. (Last test Mar. 9, '91–633 lbs.)
" 2	⅝ "	Crown.....	10300	.....	.....	.....	.....	625	.....	310	120	Not stated.	Taken out for test. (Last test May 13, '90–625 lbs.)
" 3	⅝ "	Crown.....	11138	.....	.....	.....	.....	639	.....	315	123	347,485	Taken out for test.
" 3	¾ "	B. W. W.....	293	.....	.....	.....	758	.....	.....	.....	.....	56,692	Don't register. Rust in Meter.
" 3	¾ "	Worthington..	38176	.....	.....	.....	685	.....	650	312	125	149,200	Taken out for test.
" 4	1 "	Worthington..	31660	.....	.....	582	.....	.....	562	274	108	919,753	Taken out for test.
" 4	¾ "	Crown.....	10148	.....	.....	.....	709	.....	718	342·5	138	282,628	Telephone report, no force.
" 5	¾ "	B. W. W.....	388	.....	.....	.....	695	.....	.....	.....	.....	17,235	Telephone report, no force. Rust in Meter.
" 5	⅝ "	Worthington.	37974	.....	.....	.....	687	.....	642	308·5	126	90,843	Enlargement of service.
" 5	¾ "	Worthington.	38648	.....	.....	.....	615	.....	611	305	116	285,454	Enlargem't of service. (Lasttest Aug. 1, '90–631)
" 5	1 "	Worthington..	2007	.....	.....	721	.....	.....	784	228·5	.....	842,354	Unsatisfactory, leak in piston.
" 5	¾ "	Worthington..	37323	.....	.....	.....	665	.....	635	311·5	120	290,818	Taken out for test.
" 5	2 "	Worthington.	39184	1306	.....	652	.....	.....	623	307·5	120	729,548	Taken out by request of occupant.
" 5	⅝ "	Hersey.....	14539	.....	.....	.....	.....	625	.....	312·5	126	6,200	Don't register. (Last test Mar. 9, '93–633 lbs.)
" 5	⅝ "	Crown.....	11148	.....	.....	.....	.....	687	.....	332·5	126	373,881	Taken out for test.
" 5	⅝ "	Crown.....	10356	.....	.....	.....	.....	643	.....	314·5	124	176,878	Taken out for test.
" 6	⅝ "	Crown.....	37600	.....	.....	.....	.....	.....	.....	.....	.....	38,685	Don't register. Intermediate gear worn.
" 6	⅝ "	Crown.....	35452	.....	.....	.....	.....	625	.....	310	120	10,100	Don't register. (Last test Jan. 31, '93–633 lbs.)
" 6	⅝ "	Crown.....	10314	.....	.....	.....	.....	705	.....	336	128	347,942	Taken out for test.
" 6	1 "	Worthington.	39298	.....	.....	660	.....	.....	650	312·5	130	747,850	Taken out for test.
" 6	1 "	Worthington.	6273	.....	.....	631	.....	.....	616	295	112	72,642	Don't register. (Last test May 13, '92–635 lbs.)
" 6	⅝ "	Worthington.	2746	.....	.....	.....	.....	664	.....	315	120	194,675	Taken out for test.
" 6	⅝ "	Worthington.	24969	.....	.....	.....	.....	672	.....	323·5	124	180,305	Taken out for test.
" 8	¾ "	B. W. W.....	206	.....	.....	.....	.....	.....	.....	.....	.....	13,290	Tel. rep., no force. Would not reg. Filled with rust
" 8	¾ "	B. W. W.....	260	.....	.....	.....	652	.....	631	302·5	110	78,232	Telephone report, leaking.
" 8	1 "	Worthington.	5720	.....	.....	629	.....	.....	620	295	117	13,110	Don't register. (Last test Mar. 16, '93–634 lbs.)
" 8	⅝ "	Crown.....	6946	.....	.....	.....	.....	666	.....	328·5	124	358,492	Taken out for test.

Report of all Water Meters taken out of Service during the month of May, 1893.—Continued.

Date of Test.	Size of Meter.	Style of Meter.	No. of Meter.	Weight of Water Delivered Through Meter with Outlets of Different Diameters.								Quantity Registered by Meter Cubic Feet.	Remarks. Reason for Test or Cause of Trouble.
				2 in. Outlet. 20 c. ft. Registered.	1½ in. Outlet. 20 c. ft. Registered.	1 in. Outlet. 10 c. ft. Registered.	¾ in. Outlet. 10 c. ft. Registered	⅝ in. Outlet. 10 c. ft. Registered.	½ in. Outlet. 10 c. ft. Registered.	½ in. Outlet. 5 c. ft. Registered.	½ in. Outlet. 2 c. ft. Registered.		
May 8	⅝ inch	Crown.....	11199	.....	.....	.....	.....	694	.....	337·5	128	415,836	Taken out for test.
" 8	⅝ "	Crown.....	11121	.....	.....	.....	.....	651	.....	220	130	60,839	Clock broken.
" 8	⅝ "	Crown.....	9804	.....	.....	.....	.....	618	.....	306	118	425,548	Taken out for test. (Last test Jan 23,'90–627 lbs.)
" 8	⅝ "	Crown.....	9782	.....	.....	.....	.....	635	.....	316·5	124	291,274	Taken out for test.
" 8	⅝ "	Worthington.	38376	.....	.....	.....	740	.....	688	320	127	136,469	Telephone report, no force.
" 8	⅝ "	Crown.....	37595	.....	.....	.....	.....	637	.....	317·5	125	415,850	Taken out for test. (Last test May 9,'87–625 lbs)
" 9	⅝ "	Crown.....	10351	.....	.....	.....	.....	625	.....	305	120	201,111	Taken out for test. (Last test May 26,'92–640 lbs)
" 9	⅝ "	Crown.....	69066	.....	.....	.....	.....	657	.....	325	125	236,038	Taken out for test.
" 9	⅝ "	Worthington.	25769	.....	.....	.....	.....	635	.....	316·5	120	0	Don't register.
" 9	⅝ "	Worthington.	3612	.....	.....	.....	.....	670	.....	315	126	90,603	Taken out for test.
" 10	⅝ "	Crown.....	37208	.....	.....	.....	.....	644	.....	320	127	227,010	Taken out for test.
" 10	⅝ "	Crown.....	10340	.....	.....	.....	.....	645	.....	325	125	339,568	Taken out for test.
" 10	⅝ "	Crown.....	11184	.....	.....	.....	.....	614	.....	303·5	122	391,315	Taken out for test. (Last test May 16, 1888–623 lb.)
" 10	⅝ "	Crown.....	66977	.....	.....	.....	.....	906	.....	421	158	224,714	Taken out for test.
" 10	⅝ "	Crown.....	11155	.....	.....	.....	.....	604	.....	297·5	116	279,893	Taken out for test. (Last test Feb. 14,'88–625 lb.)
" 10	⅝ "	Crown.....	38810	.....	.....	.....	.....	669	.....	323·5	127	483,135	(Not stated.)
" 10	⅝ "	Crown.....	12338	.....	.....	.....	.....	.....	.....	.....	.....	163,535	Don't register. Intermediate gear broken.
" 10	⅝ "	Metropolitan..	120	.....	.....	.....	622	.....	620	312·5	125	63,368	Tel. rep,, stopped. (Last test Nov. 23 '91–630 lbs.)
" 10	⅝ "	Metropolitan..	151	.....	.....	.....	625	.....	623	313·5	126	67,584	Clock defaced. (Last test Sept. 25, '91–629 lbs)
" 10	⅝ "	Crown.....	10291	.....	.....	.....	.....	625	.....	305	125	191.949	Taken out for test. (Last test Aug. 15,'90–637 lbs.)
" 10	⅝ "	Crown.....	11209	.....	.....	.....	.....	673	.....	326	129	315,802	Taken out for test.
" 11	⅝ "	Crown.....	6950	.....	.....	.....	.....	665	.....	324	126	338,525	Taken out for test.
" 11	⅝ "	Crown.....	12225	.....	.....	.....	.....	660	.....	322·5	125	169,721	Taken out for test.
" 11	⅝ "	Crown.....	11191	.....	.....	.....	.....	670	.....	336·5	128	522,402	Taken out for test.
" 11	⅝ "	Crown.....	9756	.....	.....	.....	.....	609	.....	300	116	257,841	Taken out for test. (Last test Mar. 31,'90–623 lbs)
" 11	⅝ "	Crown.....	9749	.....	.....	.....	.....	625	.....	307·5	124	238,797	Taken out for test. (Last test July 30,'88–628 lbs.)
" 11	⅝ "	Crown.....	11162	.....	.....	.....	.....	655	....	320	125	196,526	Taken out for test.
" 11	⅝ "	Crown.....	34596	.....	.....	.....	.....	685	.....	330	128	338,334	Taken out for test.
" 11	⅝ "	Worthington.	25877	.....	.....	.....	.....	637	.....	312·5	116	7,299	Don't register.
" 11	⅝ "	Worthington.	3687	.....	.....	.....	.....	660	.....	328	116	62.134	Taken out for test.
" 11	⅝ "	Worthington.	35763	.....	.....	.....	.....	610	.....	299·5	115	216,730	Taken out for test. (Last test June 9,'88–629 lbs.)
" 12	1 "	Worthington.	38666	.....	.....	631	.....	.....	620	298·5	116	331,561	Clock defaced.

May	12	1	inch	Crown.....	37258	.....	.....	675	.....	.....	682	327·5	127	994,012	Taken out for test.
"	12	1	"	Worthington..	7973	.....	.....	630	.....	.....	616	298·5	118	1,217,713	Taken out for test.
"	12	1	"	Worthington..	5718	.....	.....	623	.....	.....	611	300	118	1,000,423	Taken out for test. (Last test June 20,'87–625 lbs.)
"	12	⅝	"	Hersey.....	14532	.....	.....	.....	.....	637	.....	323·5	127	9,340	Don't register.
"	12	⅝	"	Crown.....	11246	.....	.....	.....	.....	635	.....	313·5	125	268,541	Taken out for test.
"	12	⅝	"	Crown.....	33288	.....	.....	.....	.....	631	.....	310·5	125	288,896	Taken out for test.
"	12	⅝	"	Crown.....	10386	.....	.....	.....	.....	614	.....	301	120	234,325	Taken out for test. (Last test Oct. 14,'90–625 lbs.)
"	13	⅝	"	Crown.....	69041	.....	.....	.....	.....	610	.....	300	119	236,655	Taken out for test. (Last test Jan. 23,'92–638 lbs.)
"	13	⅝	"	Crown.....	37591	.....	.....	.....	.....	660	.....	325	129	213,433	Taken out for test.
"	13	¾	"	Crown.....	12342	.....	.....	.....	658	.....	646	330	130	441,579	Taken out for test.
"	13	1	"	Worthington..	134	.....	.....	637	.....	.....	625	296	116	619,077	Taken out for test.
"	13	1	"	Worthington..	7203	.....	.....	628	.....	.....	625	303	126	28,147	Don't register.
"	13	1	"	Crown	34816	.....	.....	680	.....	.....	670	344	141	1,043,585	Taken out for test. (Last test Oct. 3,'90–629 lbs.)
"	13	1	"	Worthington..	16786	.....	.....	630	.....	.....	620	295	108	1,021,745	Taken out for test. (Last test May 13,'90–627 lbs.)
"	13	1	"	Worthington..	5788	.....	.....	660	.....	.....	652	308.5	128	908,330	Taken out for test.
"	13	¾	"	B. W. W.	191	.....	.....	.....	.....	.....	.....	.....	.....	66,997	Telephone report, no force. Filled with rust.
"	13	⅝	"	Worthington..	1363	.....	.....	.....	.....	638	.....	306	120	491,794	Taken out for test.
"	15	1	"	Worthington .	24331	.....	.....	.....	650	.....	645	320	139	89,358	Discontinued.
"	15	1	"	Crown.....	11133	.....	.....	.....	.....	638	.....	313·5	128	272,363	Taken out for test. (Last test Oct. 5,'88–628 lbs.)
"	15	⅝	"	Crown.....	9710	.....	.....	.....	.....	623	.....	311·5	122	178,852	Taken out for test. (Last test May 29,'88–628 lbs.)
"	15	⅝	"	Crown.....	66982	.....	.....	.....	.....	651	.....	325·5	122	217,001	Taken out for test.
"	15	⅝	"	Crown.....	6971	.....	.....	.....	.....	635	.....	312·5	124	260,167	Taken out for test.
"	15	⅝	"	Crown.....	11161	.....	.....	.....	.....	620	.....	304	118	330,652	Taken out for test. (Last test June 12,'88–627 lbs.)
"	15	⅝	"	Crown.....	6970	.....	.....	.....	.....	689	.....	332·5	128	336,881	Taken out for test.
"	15	⅝	"	Crown.....	34600	.....	.....	.....	.....	595	.....	300	122	240,411	Taken out for test. (Last test Jan. 7,'86–626 lbs.)
"	15	⅝	"	Crown.....	10238	.....	.....	.....	.....	633	.....	313	124	551,405	Taken out for test. (Last test June 11,'88–630 lbs.)
"	15	⅝	"	Worthington .	24357	.....	.....	.....	636	.....	630	302·5	120	647	Leak in Meter.
"	16	⅝	"	Crown.....	13002	.....	.....	.....	.....	639	.....	313	126	306,362	Taken out for test.
"	16	⅝	"	Crown.....	11092	.....	.....	.....	.....	625	.....	310	122	228,153	Taken out for test. (Last test Jan. 20,'90–641 lbs.)
"	16	⅝	"	Crown.....	9709	.....	.....	.....	.....	645	.....	315	130	255,894	Taken out for test. (Last test Oct. 22,'90–628 lbs)
"	16	1	"	Crown.....	34814	.....	.....	657	.....	.....	654	318	136	981,235	Taken out for test.
"	16	⅝	"	Crown.....	11197	.....	.....	.....	.....	650	.....	311·5	122	516,624	Taken out for test. (Last test May 7,'90–629 lbs.)
"	16	1	"	Worthington .	25629	.....	.....	632	.....	.....	616	306·5	.....	868,689	Taken out for test. Would't register on ⅛ in. outlet
"	16	1	"	Worthington .	2572	.....	.....	673	.....	.....	678	317·5	130	2,084,772	Taken out for test.
"	16	1	"	Worthington .	18586	.....	.....	618	.....	.....	618	302·5	120	1,188,864	Taken out for test. (Last test Mar. 26,'87–625 lbs.)
"	16	1	"	Worthington .	2158	.....	.....	630	.....	.....	620	297·5	.....	1,124,994	Taken out for test.
"	17	1	"	Worthington .	136	.....	.....	650	.....	....	637	301·5	116	917,391	Taken out for test.
"	17	1	"	Worthington .	1117	.....	.....	623	.....	.....	612	299	118	97,712	Don't register. (Last test Apr. 15,'91–637 lbs.)
"	17	⅝	"	Worthington .	1365	.....	.....	.....	.....	720	.....	335	120	223,404	Taken out for test.
"	17	1	"	Crown	11312	.....	.....	669	.....	.....	660	321	130	698,705	Taken out for test.
"	17	⅝	"	Crown.....	6915	.....	.....	.....	.....	600	.....	296	120	436,899	Don't register.
"	17	⅝	"	Crown.....	11146	.....	....	.....	.....	681	.....	330	130	336,306	Taken out for test.
"	17	⅝	"	Crown	33312	.....	.....	.....	.....	628	.....	311.5	123	65,759	Unsatisfactory. (Last test Mar. 12,'91–645 lbs.

Report of all Water Meters taken out of Service during the month of May, 1893.—Continued.

Date of Test.	Size of Meter.	Style of Meter.	No. of Meter.	Weight of Water Delivered Through Meter with Outlets of Different Diameters.								Quantity Registered by Meter Cubic Feet.	Remarks. Reason for Test or Cause of Trouble.
				2 in. Outlet. 20 c. ft. Registered.	1½ in. Outlet. 20 c. ft. Registered.	1 in. Outlet. 10 c. ft. Registered.	¾ in. Outlet. 10 c. ft. Registered.	⅝ in. Outlet. 10 c. ft. Registered.	½ in. Outlet. 10 c. ft. Registered.	½ in. Outlet. 5 c. ft. Registered.	⅜ in. Outlet. 2 c. ft. Registered.		
May 17	⅝ inch	Crown.....	9752	.....	.....	.....	.....	612	.....	306·5	122	441,176	Taken out for test. (Last test Mar. 13, '86–626 lbs.)
" 17	⅝ "	Crown.....	33309	.....	.....	.....	.....	686	.....	333·5	134	276,231	Taken out for test.
" 17	⅝ "	Crown.....	66972	.....	.....	.....	.....	640	.....	319·5	125	270,734	Taken out for test.
" 17	⅝ "	Crown.....	11233	.....	.....	.....	.....	670	.....	321	128	68,888	Don't register.
" 18	⅝ "	Crown.....	69038	.....	.....	.....	.....	623	.....	307·5	122	192,032	Taken out for test. (Last test Apr. 5, '91–635 lbs.)
" 18	⅝ "	Crown.....	13035	.....	.....	.....	.....	635	.....	310	125	156,865	Taken out for test. (Last test Dec. 15, '90–625 lbs.)
" 18	1 "	Worthington.	6547	.....	.....	612	.....	.....	602	259·5	117	662,146	Taken out for test.
" 18	⅝ "	Crown.....	34718	.....	.....	.....	.....	638	.....	312·5	120	192,687	Taken out for test.
" 18	1 "	Crown.....	81345	.....	.....	625	.....	.....	621	308	125	557,473	Taken out for test. (Last test Jan. 21, '91–636 lbs.)
" 18	1 "	Crown.....	12309	.....	.....	783	.....	.....	693	353·5	135	1,532,725	Taken out for test.
" 19	⅝ "	Crown.....	10382	.....	.....	.....	.....	719	.....	347	156	634,629	Taken out for test. (Last test Jan. 31, '91–631 lbs.)
" 19	⅝ "	Crown.....	6990	.....	.....	.....	.....	606	.....	303·5	120	234,925	Taken out for test. (Last test Nov. 21, '87–637 lbs.
" 19	⅝ "	Crown.....	10226	.....	.....	.....	.....	637	.....	310	120	301,073	Taken out for test. (Last test Sept. 6, '87–631 lbs.)
" 19	⅝ "	Crown.....	40476	.....	.....	.....	.....	.....	.....	.....	.....	12,170	Don't register. Injured by hot water.
" 19	⅝ "	Crown.....	13008	.....	.....	.....	.....	659	.....	322·5	125	278,256	Taken out for test.
" 19	⅝ "	Crown.....	10205	.....	.....	.....	.....	675	.....	325	124	349,649	Taken out for test.
" 19	⅝ "	Crown.....	69059	.....	.....	.....	.....	655	.....	322	124	189,892	Taken out for test.
" 19	⅝ "	Crown.....	13006	.....	.....	.....	.....	655	.....	322	126	282,350	Taken out for test.
" 19	⅝ "	Crown.....	12152	.....	.....	.....	.....	677	.....	330	128	337,378	Taken out for test.
" 19	⅝ "	Crown.....	11230	.....	.....	.....	.....	681	.....	330	126	313,056	Taken out for test.
" 19	⅝ "	Crown.....	37589	.....	.....	.....	.....	623	.....	305·5	122	134,451	Taken out for test. (Last test June 11, '86–619 lbs.)
" 19	⅝ "	Crown.....	6871	.....	.....	.....	.....	685	.....	335	128	424,614	Taken out for test.
" 19	⅝ "	Crown.....	66991	.....	.....	.....	.....	625	.....	308·5	124	175,711	Taken out for test. (Last test July 19, '89–623 lbs.)
" 20	⅝ "	Crown	10335	.....	.....	.....	.....	592	.....	286	113	307,295	Taken out for test. (Last test May 7, '91–624 lbs.)
" 20	1 "	Crown.....	34821	.....	.....	625	.....	.....	634	312·5	128	908,603	Taken out for test. (Last test Dec. 30, 85–625 lbs.)
" 20	1 "	Crown.....	78676	.....	.....	644	.....	.....	647	320	122	743,772	Taken out for test.
" 20	1 "	Worthington.	37671	.....	.....	676	.....	.....	640	304·5	120	533,942	Taken out for test.
" 20	2 "	Worthington.	1589	1381	.....	682	.....	.....	661	325·5	145	3,502,950	Taken out for test.
" 22	¾ "	Metropolitan...	186	.....	.....	.....	629	.....	628	312·5	122	150,517	Taken out for test. (Last test Sept. 27, '91–629 lbs.)
" 22	¾ "	Metropolitan...	362	.....	.....	.....	630	.....	626	310·5	123	421,037	Taken out for test. (Last test May 28, '92–625 lbs.)
" 22	¾ "	Metropolitan...	484	.....	.....	.....	631	.....	627	312·5	124	6,117	Service enlarged. (Last test Feb. 25, '93–630 lbs.)
" 22	⅝ "	Crown.....	38816	.....	.....	.....	.....	647	.....	322	128	274,734	Taken out for test.

May	22	1	inch	Metropolitan..	500	.....	.....	631	.....	.....	628	311·5	126	152,083	Taken out for test. (Last test Apr. 19, '92–627 lbs.)
"	22	1	"	Metropolitan..	526	.....	.....	629	.....	.....	625	311·5	126	480,676	Taken out for test. (Last test May 13,'92–629 lbs.)
"	22	1	"	Metropolitan..	544	.....	.....	631	.....	.....	626	311	125	167,730	Taken out for test. (Last test June 29,'92–630 lbs.)
"	22	5/8	"	Worthington .	25888	.....	.....	.....	.....	890	.....	430	162	438,251	Taken out for test.
"	22	1	"	Worthington .	36402	.....	.....	613	.....	.....	608	300	114	22	Clock broken.
"	23	1	"	Worthington .	37989	.....	.....	718	.....	.....	710	320	123	118,208	Telephone report, Meter stopped.
"	23	1	"	Metropolitan..	559	.....	.....	629	.....	.....	625	311·5	125	133,121	Taken out for test. (Last test Nov. 1, '92–635 lbs.)
"	23	3/4	"	Worthington .	37809	.....	.....	.....	.....	.....	.....	.....	.....	237,692	Telephone report, no force. Filled with rust.
"	23	3/4	"	Worthington .	37339	.....	.....	.....	.....	.....	.....	.....	.....	22,144	Telephone report, no force. Filled with rust.
"	23	1/2	"	Crown.....	11713	.....	.....	.....	632	.....	631	319·5	126	39,153	Meter discontinued.
"	23	1	"	Metropolitan...	522	.....	.....	634	.....	.....	630	313	127	285,313	Taken out for test. (Last test May 24,'92–627 lbs.)
"	23	1	"	Metropolitan...	502	.....	.....	626	.....	.....	625	313·5	127	522,250	Taken out for test. (Last test Sept.27,'92–628 lbs.)
"	23	3/4	"	Metropolitan...	368	.....	.....	.....	630	.....	628	312·5	126	208,520	Taken out for test. (Last test May 28,'92–629 lbs.)
"	23	1/2	"	Metropolitan...	367	.....	.....	.....	625	.....	623	311·5	125	176,330	Taken out for test. (Last test May 31,'92–630 lbs.)
"	23	5/8	"	Crown.....	7795	.....	.....	.....	649	.....	646	315	120	37,647	Enlargm't of serv. (Last test Oct. 15,'92–637 lbs.)
"	23	3/4	"	Metropolitan...	3	.....	.....	.....	645	.....	639	316	128	1,005,924	Taken out for test. (Last test Oct. 1,'88–633 lbs.)
"	23	1	"	Metropolitan...	358	.....	.....	.....	633	.....	630	314·5	126	215,938	Taken out for test. (Last test June 1,'92–626 lbs.)
"	24	1	"	Metropolitan...	10	.....	.....	.....	625	.....	622	310·5	123	179,210	Taken out for test. (Last test Mar. 9,'91–638 lbs.)
"	24	5/8	"	Crown.....	69040	.....	.....	.....	.....	625	.....	308·5	122	234,160	Taken out for test. (Last test Apr. 21,'90–637 lbs.)
"	24	3/4	"	Hersey... ...	17711	.....	.....	.....	625	.....	627	312·5	125	133,509	Don't register. (Last test Aug. 12,'91–628 lbs.)
"	24	3/4	"	Crown.....	42674	.....	.....	.....	.....	.....	.....	.....	.....	16,596	Don't register. Injured by hot water.
"	24	1	"	B. W. W.....	173	.....	.....	.....	.....	.....	.....	.....	.....	371,000	Telephone report, no force. Filled with rust.
"	24	1/2	"	B. W. W.....	259	.....	.....	.....	.....	.....	.....	.....	.....	129,512	Clock broken. Filled with rust.
"	25	1	"	B. W. W.....	162	.....	.....	.....	670	.....	645	320	123	38,085	Clock broken.
"	25	5/8	"	Crown.....	6913	.....	.....	.....	.....	645	.....	317·5	126	276,703	Taken out for test.
"	26	1½	"	Worthington .	37688	.....	1260	622	.....	606	.....	294 5	117	2,713	Discontinued.
"	26	1	"	Worthington .	23772	.....	.....	620	.....	608	.....	295	110	0	Clock defaced.
"	26	3/4	"	Crown.....	12344	.....	.....	.....	639	.....	636	302·5	120	57,302	No force.
"	26	3/4	"	Metropolitan...	185	.....	.....	.....	625	.....	625	313·5	125	145,177	Taken out for test. (Last test Sept. 27,'91–628 lbs)
"	26	5/8	"	Crown.....	40480	.....	.....	.....	.....	625	.....	303·5	121	26,988	Enlargm't of serv. (Last test Jan. 18,'93–622 lbs.)
"	26	5/8	"	Crown.....	35465	.....	.....	.....	.....	665	.....	325	126	60,573	No force.
"	26	5/8	"	Crown.....	69032	.....	.....	.....	.....	625	.....	305	120	269,947	Taken out for test. (Last test May 17,'90–635 lbs.)
"	26	5/8	"	Crown.....	7009	.....	.....	.....	.....	666	.....	324	125	339,728	Taken out for test.
"	26	5/8	"	Crown.....	11753	.....	.....	.....	.....	639	.....	310	122	16	Don't register.
"	26	5/8	"	Crown.....	6894	.....	.....	.....	.....	600	.....	296	116	196,300	Taken out for test. (Last test Jan. 14,'90–625 lbs.)
"	26	5/8	"	Crown.....	66963	.....	.....	.....	.....	645	.....	316	125	176,170	Taken out for test.
"	26	5/8	"	Crown.....	11254	.....	.....	.....	.....	617	.....	308	118	364,406	Taken out for test. (Last test Feb. 12,'92–626 lbs)
"	26	1	"	Worthington .	20527	.....	.....	640	.....	.....	628	305	118	1,011,383	Taken out for test. (Last test Mar. 4 '89–631 lbs.)
"	27	1	"	Worthington .	38487	.....	.....	612	.....	.....	600	292·5	121	206,435	Taken out for test.
"	27	1	"	Crown.....	112377	.....	.....	631	.....	.....	621	315	128	35	Telephone report, no force.
"	27	5/8	"	Crown.....	40477	.....	.....	.....	.....	623	.....	305	118	203,889	Taken out for test.
"	27	5/8	"	Crown.....	34038	.....	.....	.....	.....	.....	.....	.....	.....	41,999	Meter stopped. Injured by hot water.
"	27	5/8	"	Crown.....	65209	.....	.....	.....	.....	655	.....	323 5	124	202,643	Taken out for test.

Report of all Water Meters taken out of Service during the month of May, 1893.—Continued.

Date of Test.	Size of Meter.	Style of Meter.	No. of Meter.	Weight of Water Delivered Through Meter with Outlets of Different Diameters.								Quantity Registered by Meter Cubic Feet.	Remarks. Reason for Test or Cause of Trouble.
				2 in. Outlet. 20 c. ft. Registered.	1½ in. Outlet. 20 c. ft. Registered	1 in. Outlet. 10 c. ft. Registered.	¾ in. Outlet. 10 c. ft. Registered.	⅝ in. Outlet. 10 c. ft. Registered.	½ in. Outlet. 10 c. ft. Registered.	½ in. Outlet 5 c. ft. Registered.	¼ in. Outlet. 2 c. ft. Registered.		
May 27	⅝ inch	Crown.....	6916	.....	.....	.....	.....	667	.....	325	126	296,520	Taken out for test.
" 27	⅝ "	Crown.....	9744	.....	.....	.....	.....	650	.....	317·5	126	223,913	Taken out for test.
" 27	⅝ "	Crown.....	37214	.....	.....	.....	.....	675	.....	332·5	130	532,145	Taken out for test.
" 27	⅝ "	**Metropolitan**...	16	.....	.....	.....	.....	626	.....	312·5	124	206,244	Taken out for test. (Last test Mar. 9, '91–625 lbs.)
" 27	¾ "	**Metropolitan**..	412	.....	.....	.....	625	.....	625	310·5	124	196,489	Taken out for test. (Last test June 29, '92–629 lbs.)
" 27	¾ "	**Metropolitan**...	332	.....	.....	.....	625	.....	622	310·5	124	166,278	Taken out for test. (Last test May 3, '92–628 lbs.)
" 29	⅝ "	Crown.....	38809	.....	.....	.....	.....	631	.....	312·5	122	246,036	Taken out for test. (Last test June 24, '90–631 lbs.)
" 29	⅝ "	Crown.....	6930	.....	.....	.....	.....	731	.....	350	140	30,000	Clock broken.
" 29	¾ "	B. W. W.....	544	.....	.....	.....	.....	.....	.....	.....	.....	28,996	Tel. report, Meter stopped. Filled with rust.
" 29	¾ "	B. W. W.....	404	.....	.....	.....	826	.....	.....	.....	.....	227,739	Unsatisfactory. Rust in Meter.
" 29	¾ "	B. W. W.....	427	.....	.....	.....	678	.....	.....	.....	.....	38,146	Telephone report, no force. Filled with rust.
" 29	¾ "	Worthington.	38364	.....	.....	.....	656	.....	638	310	122	58,621	Unsatisfactory.
" 29	¾ "	Worthington.	37289	.....	.....	.....	.....	.....	.....	.....	.....	217,332	Tel. rep., Meter out of order, Filled with rust.
" 29	⅝ "	Worthington.	25893	.....	.....	.....	.....	628	.....	296	114	21,762	Clock broken.
" 29	1 "	Worthington..	23778	.....	.....	636	.....	.....	624	300	342	1,145,145	Taken out for test. (Last test Feb. 24, '91–632 lbs.)
" 29	⅝ "	Crown.....	66968	.....	.....	.....	.....	868	.....	417·5	281	88,365	Don't register.
" 29	¾ "	Crown.....	12343	.....	.....	.....	625	.....	616	302·5	130	102,855	Don't register. (Last test Nov. 5, '91–625 lbs.)
" 29	⅝ "	Crown.....	35453	.....	.....	.....	.....	655	.....	315	126	58,997	Don't reg. Gravel in Meter. Test after cleaning.
" 31	⅝ "	Crown.....	38821	.....	.....	.....	.....	639	.....	316	125	213,519	Taken out for test. (Last test July 22, '86–620 lbs.)
" 31	⅝ "	Crown.....	11127	.....	.....	.....	.....	683	.....	331·5	128	45,907	Don't register.
" 31	⅝ "	Crown.....	9705	.....	.....	.....	.....	623	.....	305	120	220,909	Taken out for test. (Last test Mar. 20, '89–633 lbs.)
" 31	⅝ "	Crown.....	65206	.....	.....	.....	.....	744	.....	361·5	138	278,471	Taken out for test.
" 31	⅝ "	Crown.....	66958	.....	.....	.....	.....	633	.....	313·5	125	231,981	Taken out for test. (Last test Apr. 21, '90–625 lbs.)
" 31	⅝ "	Crown.....	10392	.....	.....	.....	.....	669	.....	318·5	128	277,696	Taken out for test.
" 31	⅝ "	Crown.....	9799	.....	.....	.....	.....	659	.....	317·5	123	534,264	Taken out for test.
" 31	1 "	Worthington.	37351	.....	.....	642	.....	.....	620	300	120	5,431	Discontinued Meter

REMARKS*:—*Where Meters show any Resemblance to a state of Accuracy, we quote Official Test when set at Service (where obtainable), for comparison.

REPORT OF ALL WATER METERS TAKEN OUT OF SERVICE DURING THE MONTH OF JUNE, 1893.

Date of Test.	Size of Meter.	Style of Meter.	No. of Meter.	Weight of Water Delivered Through Meter with Outlets of Different Diameters.								Quantity Registered by Meter Cubic Feet.	Remarks. Reason for Test or Cause of Trouble.
				2 in. Outlet. 20 c. ft. Registered.	1½ in. Outlet. 20 c. ft. Registered.	1 in. Outlet. 10 c. ft. Registered.	¾ in. Outlet. 10 c. ft. Registered.	⅝ in. Outlet. 10 c. ft. Registered.	½ in. Outlet. 10 c. ft. Registered.	¼ in. Outlet. 5 c. ft. Registered.	¼ in. Outlet. 2 c. ft. Registered.		
June 1	⅝ inch	B. W. W.....	163	.....	.....	.....	638	.....	623	304	112	23,825	Unsatisfactory.
" 1	1 "	Worthington.	5786	.....	.....	652	.....	.....	644	305	122	434,165	Don't register. (Last test Feb. 10, '91–625 lbs.)
" 1	2 "	Worthington.	30980	1250	.....	619	.....	.....	612	295	114	564,420	Taken out for test. (Last test May 28,'91–1252 lbs.)
" 2	1 "	Worthington.	5535	.....	.....	633	.....	.....	624	301·5	118	6,547	Enl'gem'tof serv. (Last test Jan. 18, '92–630 lbs.)
" 3	⅝ "	Crown.....	44097	.....	.....	.....	.....	679	.....	330	130	216,387	Taken out for test. (Last test Mar. 18,'90–639 lbs.)
" 3	⅝ "	Crown.....	13040	.....	.....	.....	.....	693	.....	330	128	182,869	Taken out for test. Record incomplete.
" 3	⅝ "	Crown.....	13029	.....	.....	.....	.....	606	.....	300	115	241,597	Taken out for test. (Last test Feb. 9,'91–635 lbs.)
" 3	⅝ "	Crown.....	40491	.....	.....	.....	.....	625	.....	310	122	271,890	Taken out for test. (Last test Jan. 13,'88–631·5 lbs.)
" 3	⅝ "	Crown.....	12973	.....	.....	.....	.....	655	.....	318·5	125	278,930	Taken out for test. Record incomplete.
" 3	⅝ "	Crown.....	12148	.....	.....	.....	.....	655	.....	332·5	125	219,325	Taken out for test. Record incomplete.
" 5	⅝ "	Crown.....	68989	.....	.....	.....	.....	678	.....	343	133	357,260	Taken out for test. (Last test Mar. 4, '90–635 lbs.)
" 5	⅝ "	Crown.....	11398	.....	.....	.....	.....	653	.....	320	124	466,928	Taken out for test. (Last test Mar. 11,'87–631·5 lbs)
" 5	⅝ "	Crown.....	10355	.....	.....	.....	.....	689	.....	340	130	377,291	Taken out for test. Record incomplete.
" 5	⅝ "	Crown.....	33284	.....	.....	.....	.....	625	.....	302	125	294,219	Taken out for test. (Last test Feb 3, '88–625 lbs.)
" 5	1 "	Worthington..	5719	.....	.....	617	.....	.....	610	299	.....	387,614	L'k in Met Valv. out of pl. (L. test June 15,'86–625)
" 5	1 "	Worthington.	25619	.....	.....	815	.....	.....	802	380	150	681.668	Taken out for test. (Last test June 24,'86–643 lbs.)
" 5	1 "	Worthington.	17425	.....	.....	637	.....	.....	630	310	117	1,416,978	Taken out for test. (Last test Jan. 8, '91–629 lbs.)
" 5	⅝ "	Crown.....	13012	.....	.....	.....	.....	622	.....	306	121	202,646	Taken out for test. (Last test Apr. 4. '91–633 lbs.)
" 5	⅝ "	Thomson.....	11036	.....	.....	.....	.....	620	.....	306	120	267,290	Taken out for test. (Last test June 2. '91–629 lbs.)
" 6	1 "	Crown.....	71813	.....	.....	650	.....	.....	660	321·5	122	1,451,994	Taken out for test. (Last test Dec. 19, '89–625 lbs.)
" 6	½ "	Metropolitan...	479	.....	.....	.....	632	.....	630	314·5	126	9,782	Meter discontinued. (Last test Jan.25,'93–631 lbs.)
" 7	⅝ "	Crown.....	34031	.....	.....	.....	.....	661	.....	320	126	48,405	Clock broken. (Last test May 10, '92–632 lbs.)
" 7	⅝ "	Crown.....	10288	.....	.....	.....	.....	625	.....	305	119	416,160	Taken out for test. (Last test Jan. 15, '92–625 lbs.)
" 7	⅝ "	Crown.....	10198	.....	.....	.....	.....	653	.....	318·5	126	429,863	Taken out for test. Record incomplete.
" 7	⅝ "	Crown.....	33295	.....	.....	.....	.....	655	.....	320	126	251,331	Taken out for test. (Last test Nov. 9, '85–625 lbs.)
" 7	1 "	Worthington.	25751	.....	.....	632	.....	.....	625	300	118	764,435	Taken out for test. (Last test June 7, '88–634 lbs.)
" 7	⅝ "	Crown.....	69008	.....	.....	.....	.....	643	.....	313·5	122	214,495	Taken out for test. (Last test Apr. 24,'90–630 lbs.)
" 7	⅝ "	Crown.....	10207	.....	.....	.....	.....	661	.....	330	126	242,280	Taken out for test. (Last test June 10,'90–625 lbs.)
" 7	⅝ "	Crown.....	10333	.....	.....	.....	.....	638	.....	316·5	124	349,341	Taken out for test. (Record incomplete.)
" 7	1 "	Crown.....	35534	.....	.....	633	.....	.....	625	314·5	127	816,915	Taken out for test. (Last test Feb. 27,'86–625 lbs.)
" 9	1 "	Worthington.	38995	.....	.....	666	.....	.....	660	316 5	126	1,208,240	Taken out for test. (Last test May 28, '90–635 lbs.)
" 9	1 "	Worthington.	38094	.....	.....	655	.....	.....	631	308·5	116	1,175,250	Taken out for test. (Last test May 6, '89–638 lbs.)

Report of all Water Meters taken out of Service during the month of June, 1893.—Continued.

Date of Test.	Size of Meter.	Style of Meter.	No. of Meter.	Weight of Water Delivered Through Meter with Outlets of Different Diameters.								Quantity Registered by Meter Cubic Feet.	Remarks. Reason for Test or Cause of Trouble.
				2 in. Outlet. 20 c. ft. Registered.	1½ in. Outlet. 20 c. ft. Registered.	1 in. Outlet. 10 c. ft. Registered.	¾ in. Outlet. 10 c. ft. Registered	⅝ in. Outlet. 10 c. ft. Registered.	½ in. Outlet. 10 c. ft. Registered.	½ in. Outlet. 5 c. ft. Registered.	⅜ in. Outlet. 2 c. ft. Registered.		
June 9	1 inch	Hersey.....	6041	.....	.....	641	.....	.....	635	313·5	125	771,542	Taken out for test. (Last test Mar. 25,'90–631 lbs.)
" 9	⅝ "	Crown.....	12995	.....	.....	.....	.....	723	.....	338·5	139	361,687	Taken out for test.
" 9	⅝ "	Crown.....	11210	.....	.....	.....	.....	608	.....	202·5	115	171,125	Taken out for test. (Last test Apr. 9, '90–625 lbs.)
" 9	⅝ "	Crown.....	66974	.....	.....	.....	.....	658	.....	330	132	215,362	Taken out for test. (Last test Feb. 6,'90–625 lbs.)
" 9	⅝ "	Crown.....	34592	.....	.....	.....	.....	655	.....	325	125	278,537	Taken out for test. (Last test May 19,'86–625 lbs)
" 9	⅝ "	Crown.....	33293	.....	.....	.....	.....	659	....	326	128	448,150	Taken out for test. (Last test Nov. 5,'85–625 lbs.)
" 9	1 "	Worthington.	35903	.....	.....	652	.....	.....	638	303·5	120	1,078,519	Taken out for test. (Last test Sept.12,'88–635 lbs)
" 9	1 "	Worthington.	904	.....	.....	627	.....	.....	622	305	118	1,374,585	Taken out for test. (Last test Aug.13,'88–629 lbs.)
" 9	1 "	Worthington.	11707	.....	.....	639	.....	.....	632	298·5	116	1,021,521	Taken out for test. (Last test Oct. 1, '86–625 lbs)
" 9	1 "	Worthington.	25738	.....	.....	650	.....	.....	644	315	129	882,996	Taken out for test. (Last test May 9,'90–630 lbs.)
" 9	⅝ "	Crown.....	6881	.....	.....	.....	.....	650	.....	320·5	125	310,969	Taken out for test. Record incomplete.
" 9	⅝ "	Crown.....	68990	.....	.....	.....	.....	608	.....	296·5	118	203,645	Taken out for test. (Last test Feb. 1, '90–633 lbs.)
" 9	⅝ "	Crown.....	12974	.....	.....	.....	.....	638	.....	315	123	210,703	Taken out for test. (Last test July 9, '86–612 lbs.)
" 10	⅝ "	Crown.....	33329	.....	.....	.....	.....	677	.....	325	126	264,363	Taken out for test. (Last test Apr. 16,'87–631 lbs.)
" 10	⅝ "	Crown.....	13024	.....	.....	.....	.....	663	.....	323·5	127	201,715	Taken out for test. (Last test Jan. 7, '87–625 lbs.)
" 10	⅝ "	Crown.....	65222	.....	.....	.....	.....	625	.....	312·5	123	317,554	Taken out for test. (Last test May 27,'89–618 lbs)
" 10	⅝ "	Crown.....	6912	.....	.....	.....	.....	617	.....	305	120	209,690	Taken out for test. (Last test Feb. 11,'91–634 lbs.)
" 10	⅝ "	Crown.....	10219	.....	.....	.....	.....	639	.....	317·5	127	224,325	Taken out for test. (Last test May 22,'91–635 lbs.)
" 10	1 "	Crown.....	37256	.....	.....	631	.....	.....	628	314	130	757,461	Taken out for test. (Last test July 10,'86–625 lbs.)
" 10	1 "	Crown.....	10158	.....	.....	718	.....	.....	700	318·5	137	935,311	Taken out for test. (Last test Sept. 21.'87–625 lbs.)
" 10	1 "	Worthington.	1615	.....	.....	690	.....	.....	666	307·5	120	1,240,748	Taken out for test. (Last test May 10.'90–626 lbs.)
" 10	1 "	Worthington.	37372	.....	.....	780	.....	.....	744	333·5	128	999,384	Taken out for test. (Last test Aug. 15,'87–631 lbs.)
" 10	¾ "	Worthington.	37796	.....	.....	.....	625	.....	618	305·5	118	1,554	Tel. rep., leak in Meter. (Last test Oct. 24,'92–626)
" 10	⅝ "	B. W. W....	539	.....	.....	.....	.....	.....	.....	.....	.....	243,392	Would not register. Meter filled with rust.
" 10	¼ "	B. W. W....	282	.....	.....	.....	660	.....	.....	.....	.....	24,872	Telephone report, no force. Rust in Meter.
" 12	⅝ "	Hersey.....	1571	.....	.....	.....	642	.....	647	326·5	126	14	Don't register. (Last test Mar. 31, '93–638 lbs.)
" 12	⅝ "	Crown.....	11752	.....	.....	.....	.....	639	.....	318·5	125	7,045	Meter stopped. (Last test Jan. 25, '93–638 lbs.)
" 12	⅝ "	Crown.....	10250	.....	.....	.....	.....	638	.....	310 5	123	159	Don't register. (Last test Mar. 30, '93–625 lbs.)
" 12	⅝ "	Crown.....	9734	.....	.....	.....	.....	647	.....	318·5	125	240,957	Taken out for test. Record incomplete.
" 12	⅝ "	Crown.....	6967	.....	.....	.....	.....	670	.....	330	128	258,384	Taken out for test. Record incomplete.
" 12	⅝ "	Crown.....	10312	.....	.....	.....	.....	663	.....	325	122	160,589	Taken out for test. (Last test Jan 14,'90–633 lbs.)
" 12	⅝ "	Crown.....	12035	.....	.....	.....	.....	623	.....	310·5	121	130,392	Unsatisfactory. (Last test May 17, '90–627 lbs.)

June	12	¾	inch	Crown.....	69070	.....	.....	.....	625	.....	632	311	120	52,394	Out of Order. (Last test Mar. 7, '92–638 lbs.)
"	12	1	"	Crown.....	7899	.....	.....	657	.....	.....	650	335	125	942,812	Taken out for test. (Last test Sept 21,'87–631 lbs.)
"	13	⅝	"	Crown.....	11220	.....	.....	.....	.....	637	.....	312·5	123	376,350	Taken out for test. (Last test Feb. 1,'91–625 lbs.)
"	13	⅝	"	Crown.....	65213	.....	.....	.....	.....	635	.....	312·5	123	244,957	Taken out for test. (Last test May 11,'89–623 lbs.)
"	13	¾	"	Worthington..	38367	.....	.....	.....	700	.....	675	320	120	139,706	Taken out for test. (Last test Jan. 2,'89–630 lbs.)
"	13	¾	"	Worthington..	38388	.....	.....	.....	605	.....	600	295·5	112	79,161	Don't register. (Last test Feb. 23, '89–630 lbs.)
"	13	⅝	"	Crown.....	6900	.....	.....	.....	.....	.....	.....	.....	.....	212,193	For test, brass chip off casting, record incomplete.
"	13	⅝	"	Crown.....	6982	.....	.....	.....	.....	650	.....	318·5	127	426,119	Taken out for test. (Last test Jan. 14,'93–625 lbs.)
"	14	⅝	"	Crown.....	11261	.....	.....	.....	.....	635	.....	312·5	125	165 651	Taken out for test. (Last test May 7, '89–620 lbs.)
"	14	⅝	"	Crown.....	11401	.....	.....	.....	.....	625	.....	300	116	146,113	Leak in Meter. (Last test Apr. 8, '92–625 lbs.)
"	14	¾	"	Hersey.....	14536	.....	.....	.....	.....	594	.....	300	125	55,597	Don't register. (Last test Nov. 13, '91–625 lbs.)
"	14	⅝	"	Crown.....	66997	.....	.....	.....	.....	1350	.....	690	292	222,110	Don't reg. piston shrunk. (Last test Jan. 28,'91–625)
"	14	⅝	"	Crown.....	65203	.....	.....	.....	.....	650	.....	319	126	188,768	Taken out for test. (Last test May 25,'89–616 lbs.)
"	14	⅝	"	Crown.....	11108	.....	.....	.....	.....	625	.....	312·5	120	211,050	Taken out for test. Record incomplete.
"	14	⅝	"	Crown.....	66996	.....	.....	.....	.....	600	.....	295	118	373,559	Taken out for test. (Last test Oct. 12, 89–623 lbs.)
"	14	1	"	Worthington.	1617	.....	.....	619	.....	.....	608	292·5	114	567,808	Taken out for test. (Last test Aug. 18,'90–625 lbs.)
"	14	1	"	Worthington.	1610	.....	.....	633	.....	.....	620	296	116	565,018	Taken out for test. (Last test Mar. 4,'87–631 lbs.)
"	14	1	"	Worthington.	25629	.....	.....	632	.....	.....	620	297·5	116	14,834	Tel. report, leak. (Last test May 26' '93–625 lbs.)
"	14	1	"	Worthington.	25742	.....	.....	711	.....	.....	700	346·5	141	825,338	Taken out for test. (Last test Mar. 29,'87–637 lbs.)
"	14	1	"	Worthington.	2567	.....	.....	652	.....	.....	630	310	127	991,751	Taken out for test. (Last test July 12,'89–631 lbs.)
"	14	1	"	Worthington.	37381	.....	.....	677	.....	.....	648	312·5	119	718,435	Taken out for test. (Last test Dec. 17,'87–625 lbs.)
"	15	⅝	"	Worthington.	25903	.....	.....	.....	.....	905	.....	436·5	202	195,385	For test, piston worn. (Last test Apr. 11, '89–642)
"	15	⅝	"	Worthington.	25776	.....	.....	.....	.....	.....	.....	.....	....	197,143	Don't reg. piston worn. (Last test July 19, 89–640)
"	15	1	"	Worthington..	23830	.....	.....	659	.....	.....	645	305	118	265,409	Meter discontinued. (Last test Mar. 9,'88–637 lbs.)
"	15	⅝	"	Crown.....	37192	.....	.....	.....	.....	690	.....	328·5	132	133,121	Change of location. (Last test May 12,'87–625 lbs.)
"	15	⅝	"	Crown.....	10327	.....	.....	.....	.....	669	.....	336·5	130	207,435	Taken out for test. (Last test Aug. 15,'88–647 lbs.)
"	15	¾	"	Crown.....	101922	.....	.....	.....	.....	.....	.....	.....	.....	29,388	Don't register. Injured by hot water. (Last test July 25, '92–626 lbs.)
"	15	⅝	"	Crown.....	34574	.....	.....	.....	.....	628	.....	305	115	230,408	Taken out for test. (Last test Oct. 8,'86–622 lbs.)
"	15	⅝	"	Crown.....	11218	.....	.....	.....	.....	625	.....	313·5	125	35,075	Don't register. Record incomplete.
"	16	⅝	"	Crown.....	9741	.....	.....	.....	.....	661	.....	325·5	127	286,688	Taken out for test. (Last test Nov. 13,'85–625 lbs.)
"	16	⅝	"	Crown.....	10393	.....	.....	.....	.....	685	.....	330	126	382,996	Taken out for test. (Last test Jan. 5, '87–635 lbs.)
"	16	⅝	"	Crown.....	10233	.....	.....	.....	.....	687	.....	335	130	287,416	Taken out for test. (Last test Aug. 9,'92–622 lbs.)
"	16	1	"	Crown.....	6926	.....	.....	667	.....	.....	658	320 5	135	638,818	Taken out for test. Record incomplete.
"	16	1	"	Worthington.	38084	.....	.....	706	.....	.....	676	307·5	122	632,086	Taken out for test. (Last test Nov. 19.'88–625 lbs.)
"	16	2	"	Hersey.....	11651	1230	.....	609	.....	.....	604	312·5	130	85,379	Meter discontinued. (Last test June 30, '90–1236)
"	19	⅝	"	Crown	10362	.....	.....	.....	.....	631	.....	310·5	121	191,777	For test. (Last test Apr. 21,' 84–not stated)
"	19	⅝	"	Crown.....	10336	.....	.....	.....	.....	659	.....	322 5	126	159,590	Taken out for test. Record incomplete
"	19	¾	"	Worthington..	37336	.....	.....	.....	638	.....	645	316·5	118	189,343	Don't register. (Last test Aug. 3. '87–631 lbs.)
"	19	2	"	Hersey.....	11654	1243	.....	615	.....	....	635	312·5	128	1,943,822	Taken out for test. (Last test July 25,'90–1221 lbs.)
"	20	1½	"	Worthington.	33974	.....	1187	597	.....	.....	574	290·5	114	1,253,660	Taken out for test. (Last test Mar. 24,'88–631 lbs.)
"	20	1	"	Worthington.	17396	.....	.....	668	.....	.....	666	315	126	996,383	Taken out for test. (Last test June 29, 88–636 lbs.)
"	20	⅝	"	Crown.....	6987	.....	.....	.....	.....	669	.....	325	125	320,919	Taken out for test. (Last test Nov. 22,'84–623 lbs.)

Report of all Water Meters taken out of Service during the month of June, 1893.—Continued.

Date of Test.	Size of Meter.	Style of Meter.	No. of Meter.	Weight of Water Delivered Through Meter with Outlets of Different Diameters.								Quantity Registered by Meter Cubic Feet.	Remarks. Reason for Test or Cause of Trouble.
				2 in. Outlet. 20 c. ft. Registered.	1½ in. Outlet. 20 c. ft. Registered.	1 in. Outlet. 10 c. ft. Registered.	¾ in. Outlet. 10 c. ft. Registered.	¾ in. Outlet. 10 c. ft. Registered.	½ in. Outlet. 10 c. ft. Registered.	½ in. Outlet. 5 c. ft. Registered.	⅜ in. Outlet. 2 c. ft. Registered.		
June 20	⅝ inch	Crown.....	38833	.....	.....	.....	....	654	.....	325	128	529,705	Taken out for test. (Last test Aug. 14,'86–631 lbs.)
" 20	⅝ "	Crown.....	25442	.....	.....	.....	.....	.....	.....	.....	.....	41,533	Telephone report, no force. Injured by hot water. (Last test Aug. 12, '92–625 lbs.)
" 20	⅝ "	Crown.....	6960	.....	.....	.....	.....	639	.....	314·5	124	406,889	Taken out for test. (Last test June 2,'87–625 lbs.)
" 20	⅝ "	Crown.....	11083	.....	.....	.....	.....	.....	.....	.....	.....	121,645	Don't register. Injured by hot water. (Last test Sept. 7, '88–625 lbs.)
" 20	⅝ "	Crown.....	69006	.....	.....	.....	.....	628	.....	312·5	123	182,600	Don't register. (Last test Sept. 27, '89–630 lbs.)
" 20	⅝ "	Crown.....	6891	.....	.....	.....	.....	625	.....	312·5	125	166,627	Taken out for test.(Last test Sept.18.'89–644 lbs.)
" 21	1 "	Worthington.	23823	.....	.....	678	.....	.....	667	320	128	1,319,669	Taken out for test. (Last test Mar.30,'87–637 lbs.)
" 21	1 "	Crown.....	34628	.....	.....	666	.....	.....	650	326	146	554,791	Taken out for test. (Last test Apr.22,'86–637 lbs.)
" 21	¾ "	Worthington.	38656	.....	.....	.....	619	.....	616	301	114	117,745	Enlargem't of service. (Last test July 3.'90–625)
" 21	¾ "	Worthington.	61834	.....	.....	.....	710	.....	710	318·5	124	151,724	Don't register. (Last test Aug. 11, '90–626 lbs.)
" 22	⅝ "	Crown.....	69027	.....	.....	.....	.....	669	.....	325·5	126	270,208	Taken out for test. (Last test Apr. 25,'90–639 lbs.)
" 22	⅝ "	Crown.....	11077	.....	.....	.....	.....	.....	.....	.....	.....	14,521	Don't reg. Met.worn out.(Last test Mar.4,'93–639)
" 22	⅝ "	Crown.....	10344	.....	.....	.....	.....	651	.....	324	126	249,235	Tel. report, leaking.(Last test Jan.11,'90–630 lbs.)
" 22	⅝ "	Crown.....	10250	.....	.....	.....	.....	671	.....	318·5	123	1,647	Tel. report, leaking.(Last test July 17,'90–633 lbs)
" 22	⅝ "	Crown.....	40472	.....	.....	.....	.....	635	.....	312·5	120	52,117	Stopped in service. (Last test June 4.'89–639 lbs.)
" 23	1 "	Crown.....	7293	.....	.....	630	.....	.....	618	304	118	343,188	Don't register. (Last test Sept. 22, '87–625 lbs.)
" 23	1 "	Hersey.....	6041	.....	.....	636	.....	.....	627	312·5	120	2,365	Leaking.
" 23	⅝ "	Crown.....	13121	.....	.....	.....	.....	693	.....	335	128	91,007	Don't register. (Last test June 29, '92–637 lbs.)
" 23	⅝ "	Crown.....	11247	.....	.....	.....	.....	604	.....	297·5	113	52,751	Unsatisfactory. (Last test Apr. 2,'90–625 lbs.)
" 23	⅝ "	Crown.....	10318	.....	.....	.....	.....	655	.....	318·5	124	104,070	Don't register. (Last test Sep. 5, '88–621 lbs)
" 23	⅝ "	Crown.....	13039	.....	.....	.....	.....	661	.....	323·5	130	550,892	Taken out for test. (Last test Oct. 25,'87–637 lbs.)
" 24	⅝ "	Crown.....	11170	.....	.....	.....	.....	685	.....	330	126	241,556	Taken out for test. (Last test Dec. 23,'84–631 lbs.)
" 24	⅝ "	Crown.....	6942	.....	.....	.....	.....	673	.....	326	129	284,855	Taken out for test. No record.
" 26	⅝ "	Crown.	67003	.....	.....	.....	.....	690	.....	387	128	190,811	Taken out for test.(Last test June 20,'89–625 lbs.)
" 26	1 "	Crown.....	10181	.....	.....	679	.....	.....	664	322·5	129	960,039	Taken out for test. (Last test Jan. 10,'87–637 lbs.)
" 26	1 "	Worthington..	5784	.....	.....	685	.....	.....	676	320	157	963,060	Taken out for test.(Last test Nov. 29,'87–631 lbs.)
" 26	¾ "	B. W. W.....	131	.....	.....	.....	.....	.....	.....	.....	.....	10,499	Don't register. Meter filled with rust.
" 26	1 "	Worthington.	5070	.....	.....	636	.....	.....	630	303	120	1,155,205	Taken out for test. (Last test June 2,'86–625 lbs.)
" 26	1 "	Worthington.	488	.....	.....	588	.....	.....	580	283 5	112	956,702	Taken out for test (Last test June 30,'86–625 lbs.)
" 27	1 "	Worthington.	2575	.....	.....	650	.....	.....	650	300	120	1,085,179	Taken out for test. (Last test May 16,'86–625 lbs.)

June	27	1	inch	Worthington.	37377	.....	.....	672	.....	.....	680	325·5	126	819,264	Taken out for test. (Last test Jan. 8,'89–634 lbs.)
"	27	1	"	Worthington.	636	.....	.....	615	.....	.....	612	280	114	726,241	Taken out for test. (Last test Apr. 10,'89–626 lbs.)
"	27	¾	"	Metropolitan.	659	.....	.....	.....	643	.....	638	313·5	126	1,303	Meter discontinued. (Last test May 25,'93–631 lbs.)
"	27	1	"	Worthington.	23841	.....	.....	618	.....	.....	612	300	117	878,631	Taken out for test. (Last test Feb. 2, '87–625 lbs.)
"	27	⅝	"	Crown.....	11172	.....	.....	.....	.....	820	.....	390	162	380,085	Taken out for test. Record incomplete.
"	29	⅝	"	Crown.....	34041	.....	.....	.....	.....	661	.....	321	126	50,580	Don't register. (Last test Feb. 5, '92–637 lbs.)
"	29	1	"	Worthington.	31312	.....	.....	710	.....	.....	698	331	122	1,037,518	Taken out for test. (Last test Oct. 31,'87–631 lbs.)
"	29	1½	"	Worthington.	37344	.....	1332	649	.....	.....	638	310	118	1,426,717	Taken out for test. Record incomplete.
"	29	1	"	Worthington.	6548	.....	.....	668	.....	.....	660	325	125	1,116,613	Taken out for test. (Last test Sept.27,'88–629 lbs)
"	30	1	"	Crown.....	34815	.....	.....	644	.....	.....	631	320	120	1,083,620	Taken out for test. (Last test Jan.2,'86–625·5 lbs.)
"	30	1	"	Crown.....	10153	.....	.....	692	.....	.....	640	320	120	25,426	Don't register. (Last test Mar. 29, '93–638 lbs.)
"	30	2	"	Worthington.	7808	1329	.....	651	.....	.....	641	306·5	120	3,742,480	Taken out for test. (Last test Jan.5,'89–1265 lbs.)
"	30	1	"	Worthington.	35904	.....	.....	672	.....	.....	666	314·5	132	2,235,406	Taken out for test. (Last test Aug 7,'88–629 lbs.)
"	30	1	"	Worthington.	2109	.....	.....	667	.....	.....	655	315·5	122	1,551,675	Taken out for test. (Last test May 29,'86–631 lbs.)
"	30	1	"	Worthington.	39428	.....	.....	670	.....	.....	660	322·5	130	1,436,900	Taken out for test. (Last test Jan. 25,'91–634 lbs.)
"	30	1	"	Worthington.	39425	.....	.....	636	.....	.....	630	305	113	890,634	Taken out for test. (Last test Jan. 25,'91–637 lbs.)

We reiterate: 581 Water Meters re-tested for accuracy during the four consecutive months of March, April, May and June, 1893, many taken out through change of service pipes or causes other than purpose of re-test, showing in some instances surprisingly great error in registration entirely unexpected.

The value of the water over delivered in the aggregate against the Meter clocks as recorded by the defective Meters, during these four months, computed by current Meter rates, would have bought a NEW METER of like character for EVERY METER tested and recorded herein, with money to spare.

Here are FOUR CONSECUTIVE MONTHS' showing, from which you can judge whether or not it pays to handle Water Meters in your Water Department, with some system identical with Boston's.

BOSTON, MASS., WATER DEPARTMENT'S EXPERIENCE WITH
CROWN, WORTHINGTON, HERSEY AND METROPOLITAN METERS.

(ALL METERS INJURED BY FROST OR CLOCKS BROKEN, EXCLUDED.)

——1890.——

OUR AUTHORITY: BOSTON City Documents.

RECAPITULATION OF METERS. SHOWING UPON RE-TEST AFTER SERVICE PERFORMED, A LOSS TO THE WATER DEPARTMENT.
Per Centage computed in Water Delivery.

	Reported by Water Registrar as Stopped Don't Register or Unsatisfactory.				5 to 7%				8 to 11%				12 to 15%				16 to 19%				20 to 30%				31 to 50%				4% & over				Registering against the consumer.				Meters Re-adjusted to Accuracy after Duty Performed. Before re-setting at service.				Meters Repaired by Meter Mfrs. or by Water Dept. including those taken apart and cleaned before re-setting.				Meters Destroyed or Injured by Hot Water.		Bills Paid Meter Makers for Repairs on their make of Meters.			
	Crown.	Worthington.	Hersey.	Metropolitan.	Crown.	Worthington.	Hersey.	Metropolitan.	Crown.	Worthington	Hersey.	Metropolitan.	Crown.	Worthington.	Hersey.	Metropolitan.	Crown.	Worthington.	Hersey.	Metropolitan.	Crown.	Worthington.	Hersey.	Metropolitan.	Crown.	Worthington.	Hersey.	Metropolitan.	Crown.	Worthington.	Hersey.	Metropolitan.	Crown.	Worthington.	Hersey.	Metropolitan.	Crown.	Worthington.	Hersey.	Metropolitan.	Crown.	Worthington.	Hersey.	Metropolitan.	Crown.	Hersey.	National Meter Co.	H. R Worthington.	Hersey Mfg. Co.	METROPOLITAN METERS.
No. 138, '90, Jan.	3	7	..	..	9	.	..	..	5	1	..	..	2	..	..	..	..	1	..	..	2	..	..	..	..	..	..	..	1	2	..	..	28	7	..	..	16	12	..	..	1	..						
" 138, '90, Feb.	5	6	2	..	4	1	..	..	2	..	..	..	2	1	..	..	1	1	..	..	3	..	..	..	..	..	..	..	..	3	1	..	16	12	..	..	11	4	1	..	1	..						
" 138, '90, Mar.	4	7	1	..	15	4	..	..	7	3	..	..	5	1	..	..	2	..	..	..	1	1	..	..	..	..	..	..	..	1	6	..	32	20	3	..	21	8	..	..	5	..						
" 138, '90. Apr.	5	1	..	..	6	..	..	..	5	1	..	..	3	..	..	..	..	..	..	..	4	1	..	..	..	..	..	..	..	..	..	..	20	8	..	..	16	9	..	..	2	..						
" 154, '90, May	2	2	..	..	8	3	..	..	11	4	..	..	1	..	..	..	3	..	..	..	2	2	..	..	3	1	..	..	1	2	..	..	33	21	..	..	15	10	..	..	..	..						
" 136, '90, June	3	1	..	..	1	1	3	..	4	1	..	..	5	1	..	..	..	2	..	..	..	1	..	..	..	..	..	..	..	..	..	..	12	3	..	..	26	6	..	1	1	..						
" 154, '90, July	..	1	..	..	3	2	..	..	1	2	..	..	..	1	..	..	1	1	..	..	..	..	..	..	..	..	..	..	1	..	..	..	9	13	..	..	20	8	..	..	..	..						
" 155,'90, Aug.	1	1	..	..	4	1	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	10	13	..	..	6	4	..	..	..	..						
" 166,'90, Sept.	1	..	..	..	4	4	..	..	4	2	..	..	..	2	..	..	..	..	..	..	..	2	..	..	..	1	..	..	..	2	..	..	19	19	1	..	12	10	..	..	..	..						
" 194, '90, Oct.	3	3	..	..	9	2	..	..	5	..	..	..	3	1	..	..	1	..	..	..	.	..	..	..	1	..	..	..	..	..	..	..	26	8	5	..	19	6	2	..	..	..						
" 208, '90. Nov.	2	2	..	..	1	1	..	..	3	2	..	..	1	2	..	..	1	..	..	..	..	2	..	..	1	..	..	..	..	..	..	..	5	6	..	..	2	4	..	..	..	..						
" 5, '91, Dec.	4	2	1	..	8	..	..	..	6	..	..	..	3	..	..	..	2	..	..	..	..	1	1	..	..	1	1	..	..	..	..	..	26	10	..	..	15	11	2	1	2	..						
1890. Recapitulation..	33	33	4		72	19	3		55	16			25	9			11	5			12	10	1		5	3	1		3	11	7		236	140	9		179	92	5	2	12						NOTHING.	

TOTAL NUMBER OF RESPECTIVE METERS IN SERVICE JANUARY 1st, 1891:

CROWN 1869, WORTHINGTON 1476, HERSEY 120, METROPOLITAN 9.

Total expenditure Repairing Meters and Re-setting Exclusive of New Meters January 1st, 1890, to January 1st, 1891, $12,913.88.

BOSTON, MASS., WATER DEPARTMENT'S EXPERIENCE WITH
CROWN, WORTHINGTON, HERSEY AND METROPOLITAN METERS.

(ALL METERS INJURED BY FROST OR CLOCKS BROKEN, EXCLUDED.)

—1891.—

OUR AUTHORITY: BOSTON City Documents.

RECAPITULATION OF METERS. SHOWING UPON RE-TEST AFTER SERVICE PERFORMED, A LOSS TO THE WATER DEPARTMENT.
Per Centage computed in Water Delivery

	Reported by Water Registrar as Stopped Don't Register or Unsatisfactory.				5 to 7%				8 to 11%				12 to 15%				16 to 19%				20 to 30%				31 to 50%				Registering against the consumer. 4% & over				Meters Re-adjusted to Accuracy after Duty Performed. Before re-setting at service.				Meters Repaired by Meter Mfrs. or by Water Dept. including those taken apart and cleaned before re-setting.				Meters Destroyed or Injured by Hot Water.		Bills Paid Meter Makers for Repairs on their make of Meters.
	Crown.	Worthington.	Hersey.	Metropolitan.	Crown.	Worthington.	Hersey.	Metropolitan.	Crown.	Worthington	Hersey.	Metropolitan.	Crown.	Worthington.	Hersey.	Metropolitan.	Crown.	Worthington.	Hersey.	Metropolitan	Crown.	Worthington.	Hersey.	Metropolitan.	Crown.	Worthington.	Hersey.	Metropolitan.	Crown.	Worthington.	Hersey.	Metropolitan.	Crown.	Worthington.	Hersey.	Metropolitan.	Crown.	Worthington.	Hersey.	Metropolitan.	Crown.	Hersey.	
No. 85, '91, Jan.	6	..	..	..	10	2	..	..	6	2	..	..	4	2	..	..	2	..	..	..	1	..	..	..	5	2	..	..	..	..	..	..	20	16	..	..	13	8	..	..	4	..	National Meter Co.
" 44, '91, Feb.	3	1	..	..	16	2	..	2	8	..	..	..	10	2	..	..	3	2	..	..	2	1	..	..	3	1	..	1	..	1	..	..	30	12	..	..	14	2	1	..	1	..	H. R. Worthington.
" 62, '91, Mar.	3	3	..	..	5	2	..	1	1	..	..	..	3	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	1	1	1	..	13	9	..	4	25	16	8	1	3	..	Hersey Mfg. Co.
" 85, '91, Apr.	6	2	..	..	6	3	..	..	2	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	2	..	..	14	14	2	..	11	10	..	..	2	..	$21.50.
" 99, '91, May	8	4	1	..	7	1	..	..	1	1	..	..	3	2	..	..	1	..	..	..	2	..	..	..	1	1	1	..	1	1	..	..	18	21	..	..	11	11	3	..	3	..	NOTHING.
" 114, '91, June	5	8	1	..	6	1	..	..	2	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	2	1	..	..	..	..	..	9	12	..	..	14	10	2	..	2	1	METROPOLITAN METERS.
" 122, '91, July	8	4	..	1	3	1	..	..	3	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	1	..	..	12	7	..	..	14	14	1	1	2	..	
" 135, '91, Aug.	3	3	..	..	4	..	..	..	3	1	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	2	..	..	..	..	..	..	6	9	..	..	2	9	3	..	..	..	
" 151, '91, Sept.	15	14	2	..	4	3	..	..	2	2	..	..	1	1	..	..	..	..	..	..	2	2	..	..	1	1	..	..	..	1	..	..	12	8	..	..	20	8	1	..	1	..	
" 164, '91, Oct.	14	11	4	..	4	1	..	..	1	1	..	..	2	..	1	..	..	3	..	..	2	..	..	..	1	1	1	..	..	..	..	..	10	15	..	..	6	11	..	..	5	1	
" 171, 91, Nov.	7	3	1	..	5	1	..	..	1	1	..	..	..	1	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	11	3	1	..	22	3	1	..	..	..	
Monthly rep. Dec 1891.	13	7	6	..	5	1	..	..	3	1	..	..	1	..	..	..	..	..	..	..	2	..	..	..	1	..	..	..	..	..	..	..	9	9	2	..	6	6	1	..	3	..	
Recapitulation ..	91	60	15	1	75	18		3	33	14			24	9	1		6	8			11	3			17	11	3	1	2	7	1		164	135	5	4	158	108	21	2	26	2	

TOTAL NUMBER OF RESPECTIVE METERS IN SERVICE JANUARY 31st, 1892:

CROWN 1928, WORTHINGTON 1514, HERSEY 181, METROPOLITAN 98.

Total Expenditure Repairing Meters and Re-setting Exclusive of New Meters, January 1st, 1891, to January 31st, 1892, $16, 65.57.

BOSTON, MASS., WATER DEPARTMENT'S EXPERIENCE WITH
CROWN, WORTHINGTON, HERSEY AND METROPOLITAN METERS.

(ALL METERS INJURED BY FROST OR CLOCKS BROKEN, EXCLUDED.)

——1892.——

OUR AUTHORITY: BOSTON City Documents.

RECAPITULATION OF METERS. SHOWING UPON RE-TEST AFTER SERVICE PERFORMED, A LOSS TO THE WATER DEPARTMENT.
Per Centage computed in Water Delivery.

	Reported by Water Registrar as Stopped Don't Register or Unsatisfactory.				5 to 7%				8 to 11%				12 to 15%				16 to 19%				20 to 30%				31 to 50%				Registering against the consumer. 4% & over				Meters Re-adjusted to Accuracy after Duty Performed. Before re-setting at service.				Meters Repaired by Meter Affrs. or by Water Dept. including those taken apart and cleaned before re-setting.				Meters Destroyed or Injured by Hot Water.		Bills Paid Meter Makers for Repairs on their make of Meters.		
	Crown.	Worthington.	Hersey.	Metropolitan.	Crown.	Worthington.	Hersey.	Metropolitan.	Crown.	Worthington	Hersey.	Metropolitan.	Crown.	Worthington.	Hersey.	Metropolitan.	Crown.	Worthington.	Hersey.	Metropolitan	Crown.	Worthington.	Hersey.	Metropolitan.	Crown.	Worthington.	Hersey.	Metropolitan.	Crown.	Worthington.	Hersey.	Metropolitan.	Crown.	Worthington.	Hersey.	Metropolitan.	Crown.	Worthington.	Hersey.	Metropolitan.	Crown.	Hersey.	National Meter Co.	
Monthly rep. Jan	12	5	3	..	2	3	..	..	4	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	3	..	..	..	..	1	..	..	12	6	..	..	3	..	3	..	5	..		
" " Feb	25	12	..	..	8	..	..	..	5	1	..	..	2	1	..	..	1	..	..	..	1	..	..	..	..	2	..	..	..	5	..	..	11	10	1	..	12	2	2	..	2	..		
" " Mar	21	12	2	..	14	1	..	..	4	3	..	..	3	3	..	..	2	..	..	..	..	..	..	..	2	3	..	..	..	..	2	..	26	14	1	..	19	9	3	1	6	..		
" " Apr	13	11	2	..	5	3	..	..	3	4	..	..	2	..	..	..	..	..	..	..	1	1	..	..	..	1	..	..	..	1	..	..	16	3	..	..	26	5	4	..	1	..		
" " May	12	10	4	..	3	4	..	..	9	..	..	..	5	..	..	..	4	1	..	..	3	3	..	..	3	1	..	..	1	1	1	..	17	11	1	..	9	2	1	..	3	..		
" " June	26	17	5	1	6	4	..	..	3	1	..	..	3	3	..	..	1	..	..	..	..	2	..	..	2	3	..	..	2	..	1	..	14	14	..	..	5	4	1	..	1	..		
" " July	13	12	4	..	2	3	..	..	4	6	..	..	1	..	..	..	..	..	..	..	2	1	..	..	1	2	..	..	..	1	..	..	12	12	1	..	3	10	1	..	..	..		
" " Aug	3	5	2	..	2	..	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	1	..	..	..	..	..	..	..	3	6	1	..	35	15	..	..	2	..		
" " Sept	12	16	3	..	4	3	..	..	1	3	1	..	2	..	1	..	..	..	..	..	..	1	..	..	..	..	..	..	..	1	..	..	4	8	3	..	4	2	6	..	3	..		
" " Oct	13	9	1	..	3	..	..	..	1	1	..	..	..	1	..	..	..	1	..	..	..	..	..	..	..	..	..	..	1	..	..	..	11	11	2	..	3	6	4	..	1	..		
" " Nov	12	13	2	2	5	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	1	..	..	..	1	..	..	..	..	..	..	..	14	13	2	..	2	..	1	..	1	..		
" " Dec	16	14	3	2	2	2	..	1	3	2	..	..	1	..	..	..	1	..	..	..	1	..	..	..	4	..	..	..	..	2	..	..	9	7	1	3	3	4	2	1	3	..		
1892. Recapitulation..	178	136	31	5	56	23	1	1	38	21	1		19	8	1		10	4			9	9			17	12			4	12	4		149	115	13	3	124	59	28	2	28		$581.53.	National Meter Co.	
																																									$568 19.	H. R Worthington.	
																																									$21.75.	Hersey Mfg. Co.	
																																									Bill of $6.05 Repairs on Meters inj. by frost.	METROPOLITAN METERS.	

TOTAL NUMBER OF RESPECTIVE METERS IN SERVICE JANUARY 31st, 1893:

CROWN 1984, WORTHINGTON 1507, HERSEY 185, METROPOLITAN 322.

Total Expenditure Repairing Meters and Re-setting Exclusive of New Meters January 31st, 1892, to January 31st, 1893, $21,697.02.

BOSTON, MASS., WATER DEPARTMENT'S EXPERIENCE WITH
CROWN, WORTHINGTON, HERSEY AND METROPOLITAN METERS.

(ALL METERS INJURED BY FROST OR CLOCKS BROKEN, EXCLUDED.)

——1893.——

OUR AUTHORITY: BOSTON City Documents.

	Reported by Water Registrar as Stopped Don't Register or Unsatisfactory.				Recapitulation of Meters. Showing upon Re-test after service performed, a loss to the Water Department. Per Centage computed in Water Delivery.																Registering against the consumer.				Meters Re-adjusted to Accuracy after Duty Performed. Before re-setting at service.				Meters Repaired by Meter Mfrs. or by Water Dept. including those taken apart and cleaned before re-setting.				Meters Destroyed or Injured by Hot Water.		Bills rendered by Meter makers for repairs on their make of Meters, to July 31. 1893			
					5 to 7%				8 to 11%				12 to 15%				16 to 19%				20 to 30%				31 to 50%				4% & over													
	Crown.	Worthington.	Hersey.	Metropolitan.	Crown.	Worthington.	Hersey.	Metropolitan.	Crown.	Worthington	Hersey.	Metropolitan.	Crown.	Worthington.	Hersey.	Metropolitan.	Crown.	Worthington.	Hersey.	Metropolitan.	Crown.	Worthington.	Hersey.	Metropolitan.	Crown.	Worthington.	Hersey.	Metropolitan.	Crown.	Worthington.	Hersey.	Metropolitan.	Crown.	Worthington.	Hersey.	Metropolitan.	Crown.	Worthington.	Hersey.	Metropolitan.	Crown.	Hersey.	National Meter Co.	
Monthly rep. Jan	17	7	2	4	8	..	1	..	6	2	..	..	1	4	..	..	..	..	..	..	7	1	..	..	..	1	..	..	..	..	..	..	9	6	2	..	46	11	1	3	5	..	$996.39	
" " Feb	13	7	4	..	4	2	..	..	4	1	..	..	2	1	1	..	..	2	..	..	2	2	..	..	..	1	..	..	1	1	..	..	16	12	1	..	11	7	1	1	3	..	$336.08	H. R Worthington.
" " Mar	24	13	2	..	11	4	..	..	3	..	..	..	1	1	..	..	2	..	..	..	1	2	..	..	..	1	..	..	1	2	..	..	31	15	..	..	31	9	4	1	4	..		
" " Apr	11	9	1	2	3	1	..	..	8	2	..	..	3	..	..	..	1	..	..	..	..	1	1	..	2	..	1	..	..	2	..	..	12	7	..	..	2	12	3	2	2	2	$92.08.	Hersey Mfg. Co.
" " May	14	13	3	1	21	6	..	..	15	5	..	..	4	4	..	..	2	1	..	..	1	..	..	..	2	1	..	..	4	1	..	..	47	21	1	..	48	11	4	1	3	..		
" " June	20	5	2	..	17	9	..	..	10	3	..	..	2	5	..	..	..	..	..	..	..	2	..	..	1	2	..	..	1	2	1	..	36	25	1	..	38	5	2	..	3	..	NOTHING.	METROPOLITAN METERS.
1893. Recapitulation..	99	54	14	7	64	22	1		46	13			13	15	1		5	3			11	8	1		5	6	1		7	8	1		151	86	5		176	55	15	8	20	2		

505 Metropolitan Meters in Service August,'93.

CAUSES FOR CHANGING METERS.

Clock broken. Ordered out for examination. Ordered out for test. Lever broken. Leak at packing. Clock defaced. Gear out of order. Injured by hot water. Leak at spindle. Rust in Meter. Spindle broken. No force. Ratchet broken. Water in piston. Solder in Meter. Bolts broken. Enlargement of service. Frozen. Spindle stuck. Stopped by dirt. Packing blown out. Valve worn out. Piston worn out. Meter burst. Piston head broken. Stopped in service. Stopped by gasket. Body broken. Piston-rod broken. Points broken off. Stopped by fish. Gear broken. Block worn out. Lever worn out. Pawls worn out. Check valve applied.

A SUBJECT FOR CONSIDERATION.

The Water Meter NEVER Registers AGAINST the Consumer, so say Meter Makers, and SOME Water Works Officials. The Proof to the Contrary.

CROWN METERS.

From Water Meter Test Reports of the Water Department, City of Boston, Mass.

Contrast the Three Tests, Before and After Duty Performed, and After Being Cleaned, WITH NO CHANGE OF GEARING.

10 Cubic feet indicates 625 lbs. *5 Cubic feet indicates 312·5 lbs.* *2 cubic feet indicates 125 lbs.*

TEST AND INDEX OF METER BEFORE SETTING.								DUTY AND TEST OF METER WHEN TAKEN OUT, SHOWING ERROR IN REGISTRATION.							
			ACCURACY TEST. WEIGHT OF WATER DELIVERED.						ACCURACY TEST. WEIGHT OF WATER DELIVERED, OR PER CENT. ERROR.						
SIZE OF METER.	NO. OF METER.	Date when Tested before Setting at Service.	1 in. Outlet. 10 c. ft. Registered	¾ in. Outlet. 10 c. ft. Registered.	⅝ in. Outlet. 10 c. ft. Registered	½ in. Outlet. 10 c. ft. Registered.	Reading of Meter Clock When Set. Cubic Feet.	Date when Re-Tested after duty.	1 in. Outlet. 10 c. ft. Registered.	¾ in. Outlet 10 c. ft. Registered.	⅝ in. Outlet. 10 c. ft. Registered.	½ in. Outlet. 10. c. ft. Registered.	½ in. Outlet. 5 c. ft Registered.	Reading of Meter Clock when out. Cubic Feet.	REMARKS. REASON FOR TEST OR CAUSE OF TROUBLE.
5/8 inch	10335	May 7, '91	.....	.....	624	.....	0	May 20, '93	.....	.....	592	.....	286	307,295	For test.
5/8 "	6894	Jan. 14, '90	.....	.....	625	.....	0	May 26, '93	.....	.....	600	.....	296	196,300	For test.
								June 3, '93	.....	.....	**671**	.....	**322·5**	**0**	**Test after being cleaned.**
5/8 "	40483	Oct. 12, '86	.....	.....	631	.....	0	May 6, '87	.....	.....	602	.....	.....	0	Don't register.
5/8 "	68990	Feb. 1, '90	.....	.....	633	.....	0	June 9, '93	.....	.....	608	.....	293·5	203,645	For test.
								June 13, '93	.....	.....	**659**	.....	**320·5**	**0**	**Test after being cleaned.**
5/8 "	7006	May 1, '90	.....	.....	638	.....	0	Mar. 23, '93	.....	.....	606	.....	303	43,570	Don't register.
5/8 "	12142	Mar. 18, '90	.....	.....	637	.....	0	Sept. 15, '90	.....	.....	605	.....	302	23,000	Order of Water Registrar.
5/8 "	11247	Mar. 26, '90	.....	.....	Not stated.	.....	0	June 23, '93	.....	.....	604	.....	297·5	52,751	Unsatisfactory.
								June 27, '93	.....	.....	**639**	.....	**311·5**	**0**	**Test after cleaning.**
5/8 "	10386	Oct. 14, '90	.....	.....	625	.....	4,176	May 12, '93	.....	.....	614	.....	301	234,325	For test.
								May 13, '93	.....	.....	**633**	.....	**312·5**	**0**	**Test after cleaning.**
5/8 "	11210	Apr. 9, '90	.....	.....	625	.....	0	June 9, '93	.....	.....	608	.....	302 5	171,121	For test.
								June 13, '93	.....	....	**693**	.....	**321 5**	**0**	**Test after cleaning.**
5/8 "	12948	Apr. 28, '90	.....	.....	625	.....	0	Nov. 24, '91	.....	.....	606	.....	297	52,981	Enlargement of service.
								Nov. 24, '91	.....	.....	**647**	.....	**320**	**53 001**	**Test after cleaning.**
5/8 "	11277	.....	.....	.....	Not stated.	.....	0	July 15, '90	.....	.....	582	.....	287·5	45,041	Change of location.

⅝ inch	6906	.....	.....	.....	Not stated.	.....	.....	Jan. 31, '93	.....	.....	660	.....	293·5	81,504	For test.
								Feb. 3, '93	.....	.....	803	.....	375·5	81,518	Test after cleaning.
⅝ "	33285	.....	.....	.....	Not stated.	.....	.....	Aug. 21, '90	.....	.....	607	.....	300	29,407	By order of Water Registrar.
⅝ "	13029	Feb. 9, '91	.....	.....	635	.....	0	June 3, '93	.....	.....	606	.....	300	241,597	For test.
								June 5, '93	.....	.....	675	.....	313·5	0	Test after cleaning.
⅝ "	6912	Feb. 11, '91	.....	.....	634	.....	0	June 10, '93	.....	.....	617	.....	305	290,690	For test.
								June 13, '93	.....	.....	705	.....	330	0	Test after cleaning.
⅝ "	9702	.....	.....	.....	.....	.....	.....	Mar. 22, '91	.....	.....	588	.....	290	37,530	By order of Water Registrar.
⅝ "	12171	Jan. 6, '91	.....	.....	623	.....	0	Oct. 9, '91	.....	.....	609	.....	296	45,242	Don't register.
⅝ "	12275	Jan. 12, '92	.....	.....	640	.....	35,933	Oct. 17, '92	.....	.....	612	.....	293·5	62,628	Unsatisfactory.
⅝ "	11177	.....	.....	.....	Not stated.	.....	.....	Apr. 8, '91	.....	.....	620	.....	302	51,593	By order of Water Registrar.
								Apr. 8, '91	.....	.....	665	.....	320	51,614	Test after cleaning.
⅝ "	12939	.....	.....	.....	Not stated.	.....	.....	May 15, '91	.....	.....	600	.....	295	51,430	By order of Water Registrar.
								June 2, '91	.....	.....	668	.....	320·5	0	Test after cleaning.
⅝ "	43150	Dec. 31, '86	.....	.....	638	.....	0	Sept. 19, '91	.....	.....	604	.....	301·5	8,593	Discontinued.
⅝ "	69041	Jan. 23, '92	.....	.....	638	.....	0	May 13, '93	.....	.....	610	.....	300	236,655	For test.
								May 13, '93	.....	.....	635	.....	312·5	0	Test after cleaning.
⅝ "	37213	Apr. 22, '92	.....	.....	630	.....	0	Apr. 11, '93	.....	.....	608	.....	300	71'600	Reported leaking.
								Apr. 19, '93	.....	.....	639	.....	305·5	0	Test after cleaning.
⅝ "	38830	.....	.....	.....	.....	.....	.....	May 11, '92	.....	.....	617	.....	305	24,411	For test.
								May 11, '92	.....	.....	675	.....	340	24,448	Test after being cleaned.
⅝ "	7625	.....	.....	.....	.....	.....	.....	May 18, '92	.....	.....	602	.....	297·5	4,202	Don't register.
								May 20, '92	.....	.....	649	.....	325	4,248	Test after being cleaned.
⅝ "	10245	.....	.....	.....	.....	.....	.....	May 25, '92	.....	.....	595	.....	292	38,861	Unsatisfactory.
								May 25, '92	.....	.....	625	.....	313·5	0	Test after cleaning.
⅝ "	12978	.....	.....	.....	.....	.....	.....	June 3, '92	.....	.....	600	.....	297·5	91,944	Clock defaced.
								June 4, '92	.....	.....	649	.....	314·5	91,963	Test after cleaning.
⅝ "	40488	.....	.....	.....	.....	.....	.....	June 23, '92	.....	.....	610	.....	297·5	60,610	Enlargement of service.
⅝ "	11397	.....	.....	.....	.....	.....	.....	June 30, '92	.....	.....	605	.....	291	89,150	Don't register.
⅝ "	69058	.....	.....	.....	.....	.....	.....	July 27, '92	.....	.....	609	.....	300	41,901	Don't register.
⅝ "	11155	Feb. 14, '88	.....	.....	625	.....	0	May 10, '93	.....	.....	604	.....	297·5	279,893	For test.
⅝ "	34600	Jan. 7, '86	.....	.....	624	.....	0	May 15, '93	.....	.....	595	.....	300	240,411	For test.
								May 24, '93	.....	.....	629	.....	311 5	0	Test after being cleaned.
⅝ "	6915	.....	.....	.....	.....	.....	.....	May 17, '93	.....	.....	600	.....	296	436,899	Don't register.
								May 18, '93	.....	.....	643	.....	325	0	Test after being cleaned.
⅝ "	9752	Mar. 13, '86	.....	.....	624	.....	0	May 17, '93	.....	.....	612	.....	306·5	441,176	For test.
								May 17, '93	.....	.....	710	.....	340	0	Test after cleaning.
⅝ "	6990	Nov. 21, '87	.....	.....	637	.....	0	May 19, '93	.....	.....	606	.....	305·5	234,925	For test.
								May 24, '93	.....	.....	625	.....	317·5	0	Test after cleaning.
⅝ "	66996	.....	.....	.....	.....	.....	.....	June 14, '93	.....	.....	600	.....	295·5	373,559	For test.
								June 22, '93	.....	.....	637	.....	316·5	0	Test after cleaning.

The above are a FEW specimen cases of Crown Meters amongst MANY on record, where the Water-Taker paid for what HE DID NOT receive.

A SUBJECT FOR CONSIDERATION.

"Our Meter is Guaranteed for Five Years." "The Best All-around Meter on the Market."

SHOWING SAME FREAKS AS CROWN'S, ONLY SOMEWHAT WORSE IF ANYTHING.

HERSEY METERS.

From Water Meter Test Reports of the Water Department, City of Boston, Mass.

Contrast the Three Tests, Before and After Duty Performed, and After Being Cleaned, WITH NO CHANGE OF GEARING.

10 Cubic feet indicates 625 lbs. *5 Cubic feet indicates 312·5 lbs.* *2 cubic feet indicates 125 lbs.*

TEST AND INDEX OF METER BEFORE SETTING.								DUTY AND TEST OF METER WHEN TAKEN OUT, SHOWING ERROR IN REGISTRATION.							
Size of Meter.	No. of Meter.	Date when Tested before Setting at Service.	ACCURACY TEST. Weight of Water Delivered. 1 in. Outlet. 10 c. ft. Registered.	ACCURACY TEST. Weight of Water Delivered. ¾ in. Outlet. 10 c. ft. Registered.	ACCURACY TEST. Weight of Water Delivered. ⅝ in. Outlet. 10 c. ft. Registered.	ACCURACY TEST. Weight of Water Delivered. ½ in. Outlet. 10 c. ft. Registered.	Reading of Meter Clock when set. Cubic feet.	Date when Re-Tested after duty.	ACCURACY TEST. Weight of Water Delivered, or p. ct. error. 1 in. Outlet. 10 c. ft. Registered.	ACCURACY TEST. Weight of Water Delivered, or p. ct. error. ¾ in. Outlet. 10 c. ft. Registered.	ACCURACY TEST. Weight of Water Delivered, or p. ct. error. ⅝ in. Outlet. 10 c. ft. Registered.	ACCURACY TEST. Weight of Water Delivered, or p. ct. error. ½ in. Outlet. 5 c. ft. Registered.	Reading of Meter Clock when out Cubic feet.	REMARKS. Reason for Test or Cause of Trouble.
⅝ inch	4472	Mar. 12, '89	.....	.....	625	.....	19	Apr. 26, '93	.....	.....	574	.....	289	67,562	For test.
								Apr. 28, '93	.....	.....	**641**	.....	**318·5**	**67,579**	**Test after being cleaned.**
⅝ "	4473	Mar. 27, '89	.....	.....	623	.....	28	Mar. 22, '92	.....	.....	600	.....	295	79,290	For test.
								Mar. 25. '92	.....	.....	**629**	.....	**312·5**	**79,307**	**Test after cleaning.**
⅝ "	4475	Aug. 20, '89	.....	.....	627	.....	6,925	May 28, '90	.....	.....	603	.....	300	61,977	By order of Water Registrar.
		Dec. 11, '90	.....	.....	640	.....	62,024	Sept. 11, '91	.....	.....	621	.....	315	118,060	Don't register.
⅝ "	4476	Mar. 12, '89	.....	.....	623	.....	23	Mar. 18, '91	.....	.....	603	.....	298	23,203	For test.
								Mar. 18, '91	.....	.....	**637**	.....	**318·5**	**23,223**	**Test after cleaning.**
¾ "	1555	June 23, '88	.....	633	.....	632	24	Oct. 23, '89	.....	610	.....	611	315·5	72,709	For test.
¾ "	1556	Apr. 21, '88	.....	620	.....	620	24	June 23, '92	.....	590	.....	600	303·5	190,421	Don't register.
								June 24, '92	.....	**642**	.....	**645**	**325·5**	**190,464**	**Test after cleaning.**
¾ "	1558	July 16, '88	.....	625	.....	629	57	Mar. 22, '90	.....	591	.....	595	302	87,192	By order of Water Registrar.
1 "	1560	Oct. 30, '88	.....	632	.....	628	36,996	Oct. 23, '89	.....	597	.....	596	300	164,800	For test.
		Dec. 15, '90	.....	622	.....	618	679,388	Mar. 24, '93	.....	580	.....	578	286	771,745	For test.
								Mar. 25, '93	.....	**638**	.....	**634**	**315**	**0**	**Test after cleaning.**
¾ "	1561	June 29, '88	.....	633	.....	635	35	Mar. 18, '91	.....	605	.....	600	295	245,686	For test.
								Mar. 19, '91	.....	**659**	.....	**660**	**328·5**	**245,737**	**Test after cleaning.**
¾ "	1562	Dec. 4, '89	.....	627	.....	628	3,574	Apr. 4, '92	.....	609	.....	610	304·5	174,530	Don't register.
								Apr. 4, '92	.....	**653**	.....	**654**	**325**	**174,559**	**Test after cleaning.**

¾ inch	1567	May 17, '88	.....	631	.....	630	36	Sept. 27,'90	.....	618	.....	614	306·5	74,319	For test.
		Aug. 5, '91	.....	632	.....	634	0	Apr. 21, '93	.....	607	.....	604	301	347,246	For test.
								Apr. 21,'93	.....	**635**	.....	**633**	**308**	**0**	**Test after cleaning.**
¾ "	1569	June 30, '88	.....	632	.....	637	30	Mar. 16, '92	.....	595	.....	596	302·5	80,742	Don't register.
								Mar. 16, '92	.....	**639**	.....	**640**	**325·5**	**0**	**Test after cleaning.**
¾ "	1571	Sept. 25,'88	.....	633	.....	629	3 853	Mar. 15, '93	.....	600	.....	594	304	128,347	Don't register.
¾ "	1572	July 31, '88	.....	636	.....	632	27	Oct. 23, '89	.....	614	.....	610	308 5	70,727	For test.
		Mar. 18, '91	.....	637	.....	630	240,376	Mar. 22, '92	.....	614	.....	612	309	412,467	For test.
								Mar. 25, '92	.....	**673**	.....	**672**	**334·5**	**412,537**	**Test after cleaning.**
¾ "	13308	Oct. 23, '90	.....	633	.....	629	17	Nov. 22, '92	.....	610	.....	606	303	14,533	Don't register.
								Mar. 22, '92	.....	**620**	.....	**623**	**313 5**	**14,581**	**Test after cleaning.**
¾ "	13318	Oct. 15, '90	.....	623	.....	620	40	Mar. 16, '93	.....	607	.....	600	300	237,418	Don't register.
								Mar. 23, '93	.....	**625**	.....	**625**	**311·5**	**0**	**Test after cleaning.**
¾ "	13322	Oct. 24, '90	.....	631	.....	628	27	Jan. 12, '93	.....	619	.....	617	308	20,451	Don't register.
								Jan. 13, '93	.....	**625**	.....	**632**	**313 5**	**0**	**Test after being cleaned.**
¾ "	13725	May 8, '91	.....	627	.....	629	0	Oct. 3, '92	.....	605	.....	604	300	60,300	Clock broken.
								Oct. 10, '92	.....	**630**	.....	**633**	**312·5**	**0**	**Test after cleaning.**
⅝ "	14536	Nov. 13,'91	.....	.....	625	.....	0	June 14, '93	.....	.....	594	.....	300	55,597	Don't register.
								June 15, '93	.....	.....	**625**	.....	**317·5**	**0**	**Test after cleaning.**
¾ "	15531	May 6, '91	.....	630	.....	620	22	May 6, '92	.....	595	.....	596	302	79,445	Don't register.
								May 7, '92	.....	**625**	.....	**632**	**319·5**	**0**	**Test after cleaning.**
1 "	6036	Apr. 26, '89	626	.....	.....	621	29	Apr. 21, '93	604	.....	.....	594	298	755,564	For test.
								Apr. 21, '93	**625**	.....	.....	**622**	**310**	**0**	**Test after cleaning.**
1 "	6038	Aug. 29, '89	628	.....	.....	622	51	Dec. 24, '91	608	.....	.....	596	295	301,621	For test.
1 "	6039	May 21, '89	625	.....	.....	625	35	Mar. 20, '90	600	.....	.....	601	298	195,995	For test.
1 "	6041	May 28, '89	625	.....	.....	619	29	Mar. 20, '90	600	.....	.....	595	300	167,192	For test.
1 "	6044	June 16, '89	627	.....	.....	624	60	Apr. 29, '93	587	.....	.....	584	293	975,944	For test.
1 "	6045	May 2, '89	625	.....	.....	632	30	Mar. 16, '91	594	.....	.....	596	293	67,676	For test.
								Mar. 20,'91	**625**	.....	.....	**636**	**310·5**	**67,703**	**Test after cleaning.**
1 "	6047	May 4, '89	622	.....	.....	631	28	Sept. 23,'91	616	.....	.....	615	312·5	187,694	Don't register.
								Sept. 26,'91	**633**	.....	.....	**630**	**312 5**	**0**	**Test after cleaning.**
1 "	6048	July 1, '89	618	.....	.....	635	52	Sept. 3, '92	605	.....	.....	625	322	287,588	Don't register.
								Sept. 6, '92	**625**	.....	.....	**642**	**325**	**287,606**	**Test after cleaning.**
1 "	4845	Nov. 19, '91	639	.....	.....	641	92,600	Apr. 29, '93	616	.....	.....	618	312·5	195,286	For test.
								May 1, '93	**645**	.....	.....	**658**	**337**	**195.304**	**Test after being cleaned.**

REMARKS :—Where appears Tests of Crown, Hersey, end Thomson Meters, after being cleaned, such Test occurs after the Re-test for Accuracy. The respective Meters being taken apart, the Piston taken out and simply rinsed off under a Faucet, the Meter put together again WITHOUT CHANGE OF GEAR OR ADJUSTMENT. THE METER BEING PRECISELY IN THE SAME CONDITION AS WHEN FIRST PUT AT SERVICE BEFORE DUTY WAS PERFORMED.

QUERY :—Is not our criticism on page 20, with respect to effects of Grit, Slime, and Impurities of the Water Supply upon Rubber, perfectly consistent, AND ABUNDANTLY PROVEN ?

A Few Taken at Random from Many

WORTHINGTON METERS.

From Water Meter Test Reports of the Water Department, City of Boston, Mass.

10 Cubic feet indicates 625 lbs. *5 Cubic feet indicates 312·5 lbs.* *2 cubic feet indicates 125 lbs.*

TEST AND INDEX OF METER BEFORE SETTING.								DUTY AND TEST OF METER WHEN TAKEN OUT, SHOWING ERROR IN REGISTRATION.							
Size of Meter.	No. of Meter.	Date when Tested before Setting at Service.	ACCURACY TEST. Weight of Water Delivered. 1 in. Outlet. 10 c. ft. Registered.	ACCURACY TEST. Weight of Water Delivered. ¾ in. Outlet. 10 c. ft. Registered.	ACCURACY TEST. Weight of Water Delivered. ⅝ in. Outlet. 10 c. ft. Registered.	ACCURACY TEST. Weight of Water Delivered. ½ in. Outlet. 10 c. ft. Registered.	Reading of Meter Clock when set. Cubic feet.	Date when Re-Tested after duty.	ACCURACY TEST. Weight of Water Delivered, or p. ct. error. 1 in. Outlet. 10 c. ft. Registered.	ACCURACY TEST. Weight of Water Delivered, or p. ct. error. ¾ in. Outlet. 10 c. ft. Registered.	ACCURACY TEST. Weight of Water Delivered, or p. ct. error. ⅝ in. Outlet. 10 c. ft. Registered.	ACCURACY TEST. Weight of Water Delivered, or p. ct. error. ½ in. Outlet. 10 c. ft. Registered.	ACCURACY TEST. Weight of Water Delivered, or p. ct. error. ½ in. Outlet. 5 c. ft. Registered.	Reading of Meter Clock when out Cubic feet.	REMARKS. Reason for Test or Cause of Trouble.
⅝ inch	25875	Feb. 20, '82	.....	.....	625	.....	0	Feb. 18, '90	.....	.....	598	.....	295	181,000	By order of Water Registrar.
"	20668	.....	.....	.....	.....	.....	.....	Jan. 6, 92	.....	.....	602	.....	292	36,446	Discontinued.
"	25893	.....	.....	.....	.....	.....	.....	Feb. 1, '92	.....	.....	604	.....	296 5	63,343	For test.
"	35763	June 9, '88	.....	.....	629	.....	0	May 11, '93	.....	.....	610	.....	299·5	216,730	For test.
"	61847	May 2, '88	.....	632	.....	.....	0	June 6, '90	.....	545	.....	594	295	64,000	Spindle stuck.
"	61839	Apr. 5, '88	.....	632	.....	632	0	Jan. 6, '90	.....	586	.....	594	295	132 540	Pawl worn.
"	11975	Feb. — '87	.....	.....	.....	.....	.....	Feb. 3, '90	.....	602	.....	598	285	64 400	Filled with rust.
"	24329	.....	.....	.....	.....	.....	.....	Feb. 7, '90	.....	612	.....	605	295	74,120	By order of Water Registrar.
"	61852	May 14, '88	.....	633	.....	.....	0	Feb. 13, '90	.....	610	.....	597	298	94,800	By order of Water Registrar.
"	5986	Nov. 23, '86	.....	637	.....	.....	0	Feb. 28, '90	.....	603	.....	600	291	87,000	By order of Water Registrar.
"	5559	Oct. 14, '86	.....	625	.....	.....	0	Mar. 4, '90	.....	612·5	.....	608	300	172,000	By order of Water Registrar.
"	61835	May 3, '88	.....	625	.....	620	0	Mar. 7, '90	.....	614	.....	610	300	36,000	Pawl stuck.
"	37285	July 23, '87	.....	631	.....	.....	0	Mar. 18, '90	.....	602	.....	596	285	113,000	By order of Water Registrar.
"	38180	Nov. 8, '88	.....	636	.....	629	0	Mar. 29, '90	.....	618	.....	614	302	52,000	By order of Water Registrar.
"	16798	Sept. — '88	.....	625	.....	.....	0	Mar. 29, '90	.....	597	.....	597	310	60,000	By order of Water Registrar.
"	61837	May 15, '88	.....	630	.....	626	0	Apr. 17, '90	.....	614	.....	611	311	118,000	By order of Water Registrar.
"	38648	Apr. 1, '90	.....	625	.....	615	0	May 5, '93	.....	615	.....	611	305	285,454	Enlargement of service.
"	5993	.....	.....	.....	.....	.....	.....	Feb. 6, '91	.....	583	.....	566	308·5	45,818	Change of location.
"	5994	.....	.....	.....	.....	.....	.....	Oct. 26, '91	.....	473	.....	445	296	6,422	Don't register.
"	38360	.....	.....	.....	.....	.....	.....	Apr. 24, '91	.....	610	.....	606	301	40,355	Change of location.
"	38074	.....	.....	.....	.....	.....	.....	June 23, '91	.....	610	.....	608	301	177,574	Change of location.
"	38573	.....	.....	.....	.....	.....	.....	Feb. 9, '92	.....	612	.....	610	300	15,908	Discontinued.
"	2465	Mar. — '87	.....	.....	.....	.....	....	May 22, '88	.....	605	.....	.....	.....	31,497	For test.

¾ inch	38398	.....	.....	.....	.....	.....	June 30, '92	.....	611	.....	610	300	87,370	Don't register.
¾ "	37393	.....	.....	.....	.....	.....	July 19, '92	.....	598	.....	600	291	10,777	No force.
¾ "	38577	.....	.....	.....	.....	.....	Sept. 2, '92	.....	604	.....	598	290	21,076	Don't register.
¾ "	38168	.....	.....	.....	.....	.....	Oct. 4, '92	.....	601	.....	599	295	116,905	Don't register.
¾ "	38388	Feb. 23, '89	.....	630	.....	.....	June 13, '93	.....	605	.....	600	295·5	79,161	Don't register.
1 "	5854	Jan. 25, '90	625	.....	.....	.....	Mar. 16, '90	606	.....	.....	592	283	34,659	Spindle broken.
1 "	6546	.....	.....	.....	.....	.....	Feb. 10, '90	589	.....	.....	581	283	793,700	By order of Water Registrar.
1 "	463	Nov. 16, '80	625	.....	.....	.....	Feb. 11, '90	610	.....	.....	585	271	1,225,000	By order of Water Registrar.
1 "	20534	Jan. 7, '81	625	.....	.....	.....	Mar. 29, '90	612	.....	.....	600	284	201,000	By order of Water Registrar.
1 "	637	May 15, '90	625	.....	.....	.....	Apr. 6, '91	610	.....	.....	599	287	64 608	Stopped in service.
1 "	901	.....	.....	.....	.....	.....	May 19, '90	591	.....	.....	586	285	24,742	For test.
1 "	5703	.....	.....	.....	.....	.....	May 20, '90	609	.....	.....	602	290	40,580	Change of location.
1 "	2620	Nov. 16, '86	625	.....	.....	.....	June 28, '90	611	.....	.....	608	309	85,744	Bottom Packing blown.
1 "	20527	Mar. 4, '87	631	.....	.....	.....	June 22, '90	616	.....	.....	610	298·5	525,517	For test.
1 "	11706	Aug. 6, '86	625	.....	.....	.....	July 29, '90	610	.....	.....	598	293·5	56,664	By order of Water Registrar
1 "	1617	Oct. 21, '86	625	.....	.....	.....	Aug. 18, '90	610	.....	.....	600	294	79,682	By order of Water Registrar.
1 "	7216	Feb. 4, '87	627	.....	.....	.....	Sept. 9, '90	597	.....	.....	588	290	60,955	By order of Water Registrar.
1 "	31167	.....	.....	.....	.....	.....	Jan. 7, '91	605	.....	.....	598	293	925,141	For test.
1 "	5786	Aug. 5, '86	625	.....	.....	.....	Feb. 10, '91	605	.....	.....	600	294	53,070	For test.
1 "	2034	Aug. 4, '86	625	.....	.....	.....	Mar. 24, '91	593	.....	.....	593	293	43,119	Change of location.
1 "	5860	Aug. 5, '86	625	.....	.....	.....	Apr. 17, '91	591	.....	.....	585	288	43,660	By order of Water Registrar.
1 "	5535	.....	.....	.....	.....	.....	Apr. 23, '91	583	.....	.....	577	280 5	52.957	By order of Water Registrar.
1 "	11790	.....	.....	.....	.....	.....	May 23, '91	583	.....	.....	571	298	828	By order of Water Registrar.
1 "	5781	Oct. 12, '86	625	.....	.....	.....	Feb. 16, '92	600	.....	.....	597	291	23,381	Don't register.
1 "	5720	Mar. 2, '87	631	.....	.....	.....	Sept. 16, '92	586	.....	.....	581	300	5,042	No force.
1 "	7214	Apr. 20, '86	625	.....	.....	.....	May 23, '92	574	.....	.....	569	280·5	16,404	Don't register.
1 "	7210	.....	.....	.....	.....	.....	Sept. 8, '91	600	.....	.....	593	298·5	94,544	By order of Water Registrar.
1 "	7203	June 5, '88	632	.....	.....	.....	Dec. 2, '92	591	.....	.....	589	295	2,048	By order of Water Registrar.
1 "	0069	.....	.....	.....	.....	.....	Mar. 7, '93	588	.....	.....	580	274	403,994	Don't register.
1 "	11577	.....	.....	.....	.....	.....	Apr. 10, '93	601	.....	.....	586	283·5	46,083	For test.
1 "	31660	.....	.....	.....	.....	.....	May 4, '93	582	.....	.....	562	274	919,753	For test.
1 "	38487	.....	.....	.....	.....	.....	May 27, '93	612	.....	.....	600	292·5	206,435	For test.
1½ "	0004	.....	.....	.....	.....	.....	Aug. 7, '90	600	.....	.....	595	287·5	68,330	Change of location.
1½ "	2265	.....	.....	.....	.....	.....	July 16, '91	602	.....	.....	597	295	600,483	By order of Water Registrar.
1½ "	33974	Mar. 24, '88	631	.....	.....	0	June 20, '93	597	.....	.....	574	290·5	1,253,660	For test.
2 "	647	Apr. 9, '87	625	.....	.....	703,700	Jan. 29, '90	599	.....	.....	588	281	3,800,640	By order of Water Registrar.
2 "	0065	Aug. 8, '90	628	.....	617	.....	Dec. 24, '92	592	.....	.....	584	266	88,483	Don't register.

REMARKS:—A careful Perusal of the Description and Illustrations of the METROPOLITAN METER on Pages 5 to 11, will convince the PRACTICAL Water Works Official or Mechanic, that the METROPOLITAN WATER METER CANNOT register AGAINST the consumer. We solicit any and all instances showing a short delivery of water at variance with the Meter Clock.

A SUBJECT FOR CONSIDERATION.

The Water Meter NEVER Registers AGAINST the Consumer, so say Meter Makers, and SOME Water Works Officials. The Proof to the Contrary.

THOMSON METERS.

From Water Meter Test Reports of the Water Department, City of Boston, Mass.

Contrast the Three Tests, Before and After Duty Performed, and After Being Cleaned, WITH NO CHANGE OF GEARING.

10 Cubic feet indicates 625 lbs. *5 Cubic feet indicates 312·5 lbs.* *2 cubic feet indicates 125 lbs.*

TEST AND INDEX OF METER BEFORE SETTING.								DUTY AND TEST OF METER WHEN TAKEN OUT, SHOWING ERROR IN REGISTRATION.							
Size of Meter.	No. of Meter.	Date when Tested before Setting at Service.	ACCURACY TEST. WEIGHT OF WATER DELIVERED. 1 in. Outlet. 10 c. ft. Registered	¾ in. Outlet. 10 c. ft. Registered.	⅝ in. Outlet. 10 c. ft. Registered	½ in. Outlet. 10 c. ft. Registered.	Reading of Meter Clock When Set. Cubic Feet.	Date when Re-Tested after duty.	ACCURACY TEST. WEIGHT OF WATER DELIVERED, OR PER CENT. ERROR. 1 in. Outlet. 10 c. ft. Registered.	¾ in. Outlet 10 c. ft. Registered.	⅝ in. Outlet. 10 c. ft. Registered.	½ in. Outlet. 10. c. ft. Registered.	½ in. Outlet. 5 c. ft. Registered.	Reading of Meter Clock when out. Cubic Feet.	REMARKS. REASON FOR TEST OR CAUSE OF TROUBLE.
⅝ inch	3308	May 21, '89	.....	.....	625	.....	92	May 5, '90	.....	.....	611	.....	302	81,093	For test.
⅝ "	4754	Feb. 13, '91	.....	.....	627	.....	0	Jan. 17, 93	.....	.....	617	.....	301	84,396	For test.
⅝ "	4755	Dec. 14, '89	.....	.....	642	.....	31	Mar. 19, '91	.....	.....	621	.....	308	12,973	For test.
⅝ "	4756	Jan. 7, '90	.....	.....	640	.....	0	Oct. 18, '90	.....	.....	625	.....	309·5	50,260	For test.
⅝ "	4757	Oct. 30, '89	.....	620	.....	618	40	Oct. 18, '90	.....	610	.....	610	305·5	108,407	For test.
1 "	4758	Jan. 7, '90	621	.....	.....	623	100	July 5, '92	607	....	.....	613	307	301,120	For test.
⅝ "	11036	June 2, '91	.....	.....	639	.....	18	June 5, '93	.....	.....	620	.....	306	267,290	For test.
⅝ "	11037	Feb. 13, '91	.....	.....	625	.....	18	Apr. 3, '93	.....	.....	611	.....	303·5	93,881	Enlargement of service.
⅝ "	11042	Feb. 13, '91	.....	629	.....	626	22	Mar. 16, '92	.....	619	.....	616	304	41,158	For test.
⅝ "	3791	July 27, '89	.....	619	.....	619	40	Mar. 16, '91	.....	607	.....	603	298	362,274	For test.
								Mar. 16, '91	.....	625	.....	.....	.....	362,284	Test after cleaning.

REMARKS:—The Water Department of Boston have had experience with some thirty or more Thomson Disc Meters of the ⅝ inch, ¾ inch, 1 inch, 1½ inch, and 2 inch sizes, most of which after limited service have been CONDEMNED for CAUSE.

The Piston in these Meters being made of RUBBER is subject to SAME CHARACTER of DEFECTS in service as the ROTARY Meters.

COMPARATIVE RESULTS IN SERVICE OF THE METROPOLITAN METER WITH OTHER METERS.

FROM THE OFFICIAL REPORT OF THE METER-TESTING COMMISSION, CITY OF BOSTON, 1888.

3-4 INCH SIZE METERS.

HERSEY METER.—ROTARY.

RECORD SHEETS 48 TO 52.

At start, error in registration	×1·59%
After a service of 75,000 cubic feet	—5·62%
Showing loss by wear of	7·21%

CROWN METER.—ROTARY.

RECORD SHEETS 15 TO 19.

At start, error in registration	× ·99%
After a service of 75,000 cubic feet	—2·76%
Showing loss by wear of	3·75%

WORTHINGTON METER.—PISTON.

RECORD SHEETS 111 TO 115.

At start, error in registration	— ·01%
After a service of 77,000 cubic feet	—1·86%
Showing loss by wear of	1·85%

METROPOLITAN METER.

3-4 INCH SIZE, NO. 3.

May 23d, 1888, to August 2d, 1888.

AT PROVIDENCE, R. I. WATER WORKS.

At start, error in adjustment of Gears	2·9%
After a service of 153,596 feet	3·5%
Showing loss by wear of	$\frac{6}{10}$ of 1%

SAME METER AT SERVICE IN BOSTON WATER DEPARTMENT.

Duty and Test of Meter, Showing Error in Registration.

DATE WHEN TESTED.	ACCURACY TEST. WATER DELIVERED 3-4 in. Outlet. 10 c. ft. reg.	1-2 in. Outlet. 10 c. ft. reg.	1-4 in. Outlet. 5 c. ft. reg.	1-8 in. Outlet. 2 c. ft. reg.	Reading of Meter Clock. Cubic feet Registration.	REMARKS. Reason For Test or Cause of Trouble.
October 1st, 1888.....	633	630	317·5	125	54,080	First Setting.
October 31st, 1889.....	635	644	312·5	125	221,556	For Test.
May 23d, 1893.....	645	639	316	128	1,005,924	For Test.

The LARGEST CONTINUOUS DUTY without Repairs or Alterations, and the BEST Record of any Water Meter of its size doing *practical* service in *buildings* ever in the Boston Water Works.

(Meter still in service August 1, 1893.)

METROPOLITAN METERS.

CHALLENGING COMPARISON IN POINT OF ACCURACY WITH ANY WATER METER IN THE WORLD. THIS RECORD SPEAKS FOR ITSELF.

From Water Meter Test Reports of the Water Department, City of Boston, Mass.

Showing the ENTIRE experience with all METROPOLITAN WATER METERS, during the years 1892 and 1893, taken from Service, for any and all causes, omitting none, and Tested for Accuracy (excluding all Meters destroyed by freezing.)

10 Cubic feet indicates 625 lbs. *5 Cubic feet indicates 312·5 lbs.* *2 cubic feet indicates 125 lbs.*

TEST AND INDEX OF METER BEFORE SETTING.								DUTY AND TEST OF METER WHEN TAKEN OUT, SHOWING ERROR IN REGISTRATION.							
Size of Meter.	No. of Meter.	Date when Tested before Setting at Service.	ACCURACY TEST. Weight on Water Delivered. 1 in. Outlet. 10 c. ft. Registered.	ACCURACY TEST. Weight on Water Delivered. ¾ in. Outlet. 10 c. ft. Registered.	ACCURACY TEST. Weight on Water Delivered. ½ in. Outlet. 10 c. ft. Registered.	ACCURACY TEST. Weight on Water Delivered. ¼ in. Outlet. 10 c. ft. Registered.	Reading of Meter Clock when set. Cubic feet.	Date when Re-Tested after duty.	ACCURACY TEST. Weight of Water Delivered, or per cent. error. 1 in. Outlet. 10 c. ft. Registered.	ACCURACY TEST. Weight of Water Delivered, or per cent. error. ¾ in. Outlet. 10 c. ft. Registered.	ACCURACY TEST. Weight of Water Delivered, or per cent. error. ½ in. Outlet. 10 c. ft. Registered.	ACCURACY TEST. Weight of Water Delivered, or per cent. error. ¼ in. Outlet. 5 c. ft. Registered.	ACCURACY TEST. Weight of Water Delivered, or per cent. error. ¼ in. Outlet. 2 c. ft. Registered	Reading of Meter Clock when out Cubic feet.	REMARKS. Reason for Test or Cause of Trouble.
⅝ inch	13	Mar. 9, '91	.....	.....	633	.....	74,210	May 2, '93	.....	.....	628	.....	311·5	124	274,663	Leak in Meter. (Spindle repacked and put at service)
"	15	Feb. 28, '91	.....	.....	625	.....	175,422	Mar. 1, '92	.....	.....	626	.....	313	125	313,481	For test.
"	16	Mar. 9, '91	.....	.....	625	.....	69,289	May 27, '93	.....	.....	626	.....	312·5	124	206,244	For test.
"	3	Oct. 1, '88	.....	633	.....	630	54,080	May 23, '93	.....	645	.....	639	316	128	1,005,924	For test.
"	9	Mar. 9, '91	.....	635	.....	640	53,554	June 3, '92	.....	635	.....	640	317	126	263,575	Taken out by mistake. (Immediately replaced.)
"	10	Mar. 9, '91	.....	638	.....	627	100,867	May 24, '93	.....	625	.....	622	310·5	123	179,210	For test.
"	11	Mar. 3, '90	.....	631	.....	620	84	Apr. 26, '93	.....	628	.....	625	310·5	125	326,837	For test.
"	12	Feb. 28, '90	.....	623	.....	620	84	Apr. 26, '93	.....	628	.....	624	309 5	124	295,672	For test.
"	102	July 29, '91	.....	630	.....	627	0	Feb. 16, '92	.....	631	.....	629	314 5	125	80,210	Tel. rep. frost in Meter. (Put at ser. again without rep.)
"	197	July 31, '91	.....	629	.....	626	0	Apr. 29, '93	.....	.....	.....	.....	.....	.....	42,693	Pin out of driv. pawl. (Rep.)
"	163	Sept. 25, '91	.....	628	.....	626	21	Apr. 7, '93	.....	625	.....	623	312·5	123	63,181	Tel. rep. leaking. (Spind. rep.)
"	135	Sept. 25, '91	.....	629	.....	625	25	June 23, '92	.....	631	.....	629	312·5	126	36,525	Tel. rep. leaking. (Spind. rep.)

¾ inch	172	Sept. 25, '91	.....	625	....	625	22	Apr. 19, '93	.....	630	.....	625	312·5	126	56,212	Rep. not regis'g. Gear unmeshed. (Meshed gears and reset Meter.)
¾ "	167	Sept. 25, '91	.....	630	.....	629	33	Nov. 25, '92	.....	625	.....	625	312·5	125	10,237	Stuck at spind. (Eased spind.)
¾ "	157	Sept. 25, '91	.....	627	.....	625	26	May 24, '92	.....	631	.....	631	312·5	125	.....	Hands off clock. (Rep. clock.)
¾ "	184	Sept. 25, '91	.....	630	.....	625	29	Jan. 11, '93	.....	625	.....	625	315	125	26,288	Reported not registering. Gears unmeshed. (Meshed gears, and put at service.)
¾ "	143	Sept. 25, '91	....	629	.....	627	24	Dec. 29, '92	.....	628	.....	623	312 5	128	53,811	Unsatisfactory.
¾ "	103	Mar. 8, '92	.....	626	.....	626	48,179	June 15, '92	.....	629	.....	627	313·5	125	73,644	Don't reg. Clock broken. (Repaired clock.)
¾ "	185	Sept. 27, '91	.....	628	.....	625	26	May 26, '93	.....	625	.....	625	313·5	125	145,177	For test.
¾ "	160	Sept. 27, '91	.....	628	.....	625	58	June 30, '92	.....	625	.....	622	312·5	128	34,007	Body of Meter inj. in serv. Rep'd and put at serv. again
¾ "	146	Sept. 27, '91	.....	628	.....	626	22	June 30, '92	.....	631	.....	628	311·5	125	80,890	Clock defaced.
¾ "	129	Sept. 27, '91	.....	629	.....	625	27	Apr. 7, '93	.....	630	.....	625	312 5	124	52,520	Tel. rep. leak'g. (Rep'k'd spind)
¾ "	186	Sept. 27, '91	.....	629	.....	627	24	May 22, '93	.....	629	.....	628	312 5	122	150,517	For test.
¾ "	109	Sept. 28, '91	.....	625	.....	625	23	Nov. 22, '92	.....	625	.....	625	313	126	3,125	Stuck at spind. (Eased spind.)
¾ "	120	Nov. 23, '91	.....	630	.....	627	25	May 10, '93	.....	622	.....	620	312·5	125	63,368	Telephone report, stopped.
¾ "	104	Dec. 1, '91	.....	629	.....	625	28	Jan. 4, '93	.....	635	.....	630	313	125	6,681	Upright gear loose. Test after repairs.
¾ "	154	Dec. 3, '91	.....	626	.....	624	25	Sept. 16, '92	.....	630	.....	625	312 5	125	71,056	Leak at spind. (Rep'k'd spind)
¾ "	142	Dec. 3, '91	.....	629	.....	627	24	Mar. 18, '93	.....	629	.....	625	310·5	126	128,636	Clock def. (Changed clock)
¾ "	314	Apr. 21, '92	.....	625	.....	626	17	Jan. 11, '93	.....	626	.....	625	311·5	125	6,680	For test.
¾ "	331	May 3, '92	.....	630	.....	627	23	July 6, '92	.....	630	.....	Not Taken.	Not Taken.	Not Taken.	50,237	Leak in Meter. (Rep'k'd spind)
¾ "	332	May 3, '92	.....	628	.....	625	34	May 27, '93	.....	625	.....	622	310·5	124	166,278	For test.
¾ "	345	May 4, '92	.....	626	.....	625	29	Oct. 7, '92	.....	630	....	625	314 5	127	45,180	Leak in Meter. (Rep'k'd spind)
¾ "	368	May 28, '92	.....	629	.....	626	17	May 23, '93	.....	630	.....	628	312·5	126	208,520	For test.
¾ "	360	May 28, '92	.....	630	.....	627	20	May 23, '93	.....	630	.....	625	311·5	126	53,855	Leak at spind. (Rep'k'd spind)
¾ "	362	May 28, '92	.....	625	.....	623	21	May 22, '93	.....	630	.....	626	310·5	123	421,037	For test.
¾ "	367	May 31, '92	.....	630	.....	627	26	May 23, '93	.....	625	.....	623	311·5	125	176,330	For test.
¾ "	358	June 1, '92	.....	626	.....	624	17	May 23, '93	.....	633	.....	630	314·5	126	215,938	For test.
¾ "	354	June 2, '92	.....	630	.....	627	19	Jan. 3, '93	.....	631	.....	629	311·5	127	48.070	Tel. rep. leak'g (Rep'k'd spind)
¾ "	378	June 14, '92	.....	631	.....	630	27	Nov. 17, '92	.....	630	.....	625	314 5	127	23,291	Tel. rep. leak'g (Rep'k'd spind)
¾ "	391	June 14, '92	.....	631	.....	628	40	Jan. 9, '93	.....	627	.....	624	310	125	23,958	Tel rep. leak'g (Rep'k'd spind)
¾ "	383	June 14, '92	.....	629	.....	626	27	Dec. 9, '92	.....	626	.....	624	310·5	125	68,039	Gearing unmeshed. Test after meshing gearing.
¾ "	385	June 21, '92	.....	625	.....	625	24	Jan. 26, '93	.....	631	.....	629	311·5	126	77,091	Tel. rep. leak'g (Rep'k'd spind)
¾ "	399	June 21, '92	.....	629	.....	626	25	Mar. 30, '93	.....	630	.....	625	311·5	127	Not Stated.	Enlargement of service.
¾ "	406	June 23, '92	.....	625	.....	623	28	Mar. 13, '93	.....	630	.....	626	310 5	126	1,019	Discontinued.
¾ "	413	June 24, '92	.....	630	.....	627	21	Feb. 16, '93	.....	632	.....	630	312·5	126	12,940	Tel. rep., no force. (Inadequate supply pipe.)
¾ "	412	June 29, '92	.....	629	....	625	22	May 27, '93	.....	625	.....	625	310·5	124	196,489	For test.

METROPOLITAN METERS.—Continued.

TEST AND INDEX OF METER BEFORE SETTING.								DUTY AND TEST OF METER WHEN TAKEN OUT, SHOWING ERROR IN REGISTRATION.							
Size of Meter.	No. of Meter.	Date when Tested before Setting at Service.	ACCURACY TEST. WEIGHT OF WATER DELIVERED. 1 in. Outlet. 10 c. ft. Registered	¾ in. Outlet. 10 c. ft. Registered.	⅝ in. Outlet. 10 c. ft. Registered	½ in. Outlet. 10 c. ft. Registered.	Reading of Meter Clock When Set. Cubic Feet.	Date when Re-Tested after duty.	ACCURACY TEST. WEIGHT OF WATER DELIVERED, OR PER CENT. ERROR. 1 in. Outlet. 10 c. ft. Registered.	¾ in. Outlet 10 c. ft. Registered.	⅝ in. Outlet. 10 c. ft. Registered.	½ in. Outlet. 10. c. ft. Registered.	½ in. Outlet. 5 c. ft. Registered.	⅜ in. Outlet. 2 c. ft. Registered.	Reading of Meter Clock when out. Cubic Feet.	REMARKS. REASON FOR TEST OR CAUSE OF TROUBLE.
¾ inch	442	Aug. 23, '92	.....	631	.....	627	26	Dec. 8, '92	.....	637	.....	626	310·5	125	7,909	Clock brok.(Put on new cl'k.)
"	433	Aug. 29, '92	.....	628	.....	626	35	Dec. 28, '92	.....	630	.....	624	311·5	126	41,322	Tel. rep. Trouble with Meter.
"	475	Oct. 26, '92	.....	631	.....	625	30	Jan. 17, '93	.....	625	.....	623	311·5	126	5,275	Unsatisfactory.
"	464	Dec. 20, '92	.....	630	.....	626	23	Mar. 27, '93	.....	630	.....	628	311·5	123	7,388	Leak in Meter.(Rep'k'd spind)
"	123	Jan. 20, '93	.....	631	.....	629	30	Apr. 3, '93	.....	625	.....	620	311·5	126	15,723	Leak in Meter.(Rep'k'd spind)
"	479	Jan. 20, '93	.....	631	.....	627	25	June 6, '93	.....	632	.....	630	314·5	126	9,782	Discontinued.
"	484	Feb. 25, '93	.....	630	.....	626	27	May 22, '93	.....	631	.....	627	312·5	124	6,117	Service enlarged.
"	490	Mar. 2, '93	.....	629	.....	626	34	Apr. 29, '93	.....	631	.....	629	312·5	125	2,742	Discontinued.
1 "	500	Apr. 19, '92	627	.....	.....	627	150	May 22, '93	631	.....	.....	628	311·5	126	152,083	For test.
1 "	502	Apr. 27, '92	628	.....	.....	628	46	May 26, '93	626	.....	.....	625	313·5	127	522,250	For test.
1 "	504	Apr. 30, '92	629	.....	.....	627	32	Dec. 20, '92	640	.....	.....	Not Taken.	Not Taken.	Not Taken	147,980	Tel. rep. stopped. Found nothing wrong.
1 "	506	May 2, '92	629	.....	.....	627	32	Feb. 3, '93	628	.....	.....	628	314·5	129	76,691	For test.
1 "	509	May 2, '92	628	.....	.....	625	50	Feb. 3, '93	630	.....	.....	625	313 5	126	30,602	For test.
1 "	512	May 11, '92	630	.....	.....	628	43	Mar. 30, '93	628	.....	.....	627	312·5	126	57,225	Leak at spindle. (Repacked.)
1 "	517	May 11, '92	630	.....	.....	625	41	Jan. 31, '93	630	.....	.....	624	311·5	127	339,130	Discontinued.
1 "	522	May 24, '92	627	.....	.....	628	40	May 23, '93	634	.....	.....	630	313	127	285,313	For test.
1 "	523	May 26, '92	631	.....	.....	626	51	Apr. 3, '93	.....	.....	.....	.....	.....	.....	324,878	Driv. pawl broken.(Repaired)
1 "	521	May 25, '92	625	.....	.....	627	31	Nov. 1, '92	625	.....	.....	625	314	127	175,680	Discontinued.
1 "	526	May 13, '92	629	.....	.....	628	51	May 22, '93	629	.....	.....	625	311·5	126	460,100	For test.
1 "	529	May 24, '92	629	.....	.....	627	42	Jan. 25, '93	630	.....	.....	626	312·5	127	0	Regist'g bar broken. (Rep.)
1 "	538	June 7, '92	629	.....	.....	627	71	Dec. 5, '92	650	.....	.....	656	320	130	316,878	Leak in Meter.(Rep'k'd spind)
1 "	541	June 23, '92	626	.....	.....	627	40	Apr. 21, '93	632	.....	.....	627	311·5	127	44,264	Leak in Meter.(Rep'k'd spind)
1 "	544	June 29, '92	630	.....	.....	629	50	May 22, '93	631	.....	.....	626	311	125	167,730	For test.
1 "	546	Oct. 11, '92	630	.....	.....	629	34	Feb. 6, '93	633	.....	.....	625	311·5	126	179,070	Enlargement of service.
1 "	559	Nov. 1, '92	631	.....	.....	626	64	May 23, '93	629	.....	.....	625	311·5	125	133,121	For test.
1 "	569	Nov. 4, '92	628	.....	.....	624	52	Apr. 29, '93	623	.....	.....	621	307·5	122	5,574	Change of location.
1 "	568	Nov. 4, '92	627	.....	.....	623	52	Apr. 21, '93	630	.....	.....	625	313·5	127	45,665	Tel.rep. leak'g. Pack'g blown.

TOTAL 73 METERS.

RECAPITULATION.

17 Meters reported leaking..... In every instance the leak proved to be at the spindle, a common occurrence with all Meters in all Water Departments. Special care is taken to prevent this trouble hereafter.

1 Meter taken out by mistake by employees in Water Department.

1 Meter reported frost in Meter..... The accuracy test indicates that no injury occurred to Meter.

4 Meters reported as not registering. Examination discovered gears unmeshed.

3 Meters recorded spindle stuck.....
2 Meters recorded driving pawl breaking.....
1 Meter recorded registering bar breaking..... These parts have been strengthened.

5 Meters taken out, cause clocks broken or defaced..... A common occurrence with all Meters.

2 Meters reported unsatisfactory....
1 Meter reported no force.....
1 Meter reported trouble with Meter.
2 Meters reported stopped..... In each case, consumers telephoned as reported. Trouble proved to be caused by $\frac{5}{8}$ inch iron service pipes choked with rust. Nothing the matter with the Meters as shown by respective tests.

1 Meter reported injured in service... Investigation showed that the Meter was used as a foundation upon which to build a staging by mechanics in building.

3 Meters taken out to enlarge the service pipe upon premises.

5 Meters discontinued. Consumers put back upon schedule rates.

1 Meter location changed. Alteration of plumbing in building.

23 Meters taken out for purpose of test.

73 Meters.

REMARKS.

Regardless of the cause of taking out of service the above mentioned 73 METROPOLITAN METERS, we challenge their equal in point of accuracy. Judge for yourself by a review of the FOUR CONSECUTIVE MONTHS' METER TEST REPORTS, on pages 38 to 55. The Water Department lost none of its revenue, neither did the consumer suffer an injustice through the use of the METROPOLITAN WATER METERS. The accuracy test of each and every one of the 73 Meters BEFORE and AFTER service speaks for itself.

THE CONSUMPTION OF WATER BY USE OF LAWN SPRINKLERS AND HAND HOSE.

Experiments show that the average make of Revolving Lawn Sprinkler, having eight radiating arms and top disc, perforated with $\frac{32}{100}$ holes, upon thirty-eight pounds water pressure, consumes 780 gallons of water PER HOUR, equaling 104 cubic feet.

A Revolving Lawn Spinkler having four radiating arms and top disc perforated with $\frac{32}{100}$ holes upon the same pressure, consumes 563 gallons of water PER HOUR, equaling 75 cubic feet.

One with four short circular arms and top disc, perforated with $\frac{32}{100}$ holes upon same pressure, consumes 731 gallons of water PER HOUR, equaling 98 cubic feet.

Compute this consumption at fourteen cents per 100 cubic feet, (Boston's current Meter rates,) and one may readily figure up about what the amount of revenue the Water Department is being deprived of through the indifference of our next door neighbor, whose Lawn Spinkler is constantly in use throughout the day, week in and week out, from May to October. In many instances upon large estates, the Lawn Spinkler is in continuous use day and night. What must be the enormous waste of water in such cases.

Query: Would not the universal metering of every estate with a lawn surrounding, tend to equalize the water tax?

HAND HOSE, $5.00 PER ANNUM, PRIVILEGE TO USE TWO HOURS A DAY.

A hose nozzle, varying from a $\frac{5}{8}$ inch to a $\frac{3}{16}$ inch spray or solid stream, as used upon lawns by the average person, will consume more water than a Lawn Sprinkler, during a corresponding time, hence, how far does $5.00 go towards paying for value of water used, (per Meter rates,) during ONE MONTH of summer.

Occasional espionage WILL NOT regulate the use of hand hose or Lawn Sprinklers. A METROPOLITAN WATER METER WILL, and the lawn will not suffer in consequence.

Unquestionably, here is a matter that should be regulated in a business-like manner, that the community as a whole do not pay for the excesses of a few.

A FEW CITATIONS FROM ANNUAL REPORTS OF THE BOSTON WATER BOARD.

Acknowledgments that the Water Meter is Indispensable.

April 1st, 1877, the Water Board say: "The supply was not equaling the increased consumption. The takers by Meter measurements were then paying 25 per cent. of the entire yearly revenue, and using only 16⅔ per cent. of the total consumption of water.

"The increase of consumption from 1875 to 1878 went up sixty-three per cent. while the increase in takers in the same time was only thirty-five per cent. A comparison of the amount received for water used for domestic or household purposes, and that received for water sold by Meter, showed that while the rates for the former were originally based upon a much higher price than 2½ cents per 100 gallons, (the Meter price), the amount received was only $1\frac{1}{10}\frac{1}{0}$ cents, and the income from the sale of water (which at 2½ cents per 100 gallons for the whole quantity used, would have reached $2,122,500 at the present rates), was only $945,329.96."

On May 1, 1880, Boston had in service 1097 Water Meters; on May 1, 1881, 1219 Meters; on May 1, 1882, 1673 Meters; on May 1, 1883, 2245 Meters; on May 1, 1884, 2298 Meters; on May 1, 1885, 4957 Meters.

In the Water Board's Annual Report, May 1, 1885, the Board say that "during the first six months of 1885, notwithstanding the increase of manufactures and population, the daily average consumption has been reduced to seventy gallons per capita, attributed to a rigid inspection of premises, and the extension of the Meter system, thus plainly showing that by only such methods is it possible to practically avoid the large expense of a new or additional supply — there is absolutely no other way to stop the enormous waste save by the universal use of Meters. The system thus established has accomplished great results, and it is hoped and believed that the per capita consumption may be reduced to sixty gallons in the near future.

FROM THE BOSTON WATER BOARD'S ANNUAL REPORT, DECEMBER 31st, 1885.

The Boston Water Board report that they were enabled to make a six per cent. discount upon water bills, and to make a further reduction to large takers by Meter rates — ACCREDITED TO THE INCREASED USE OF WATER METERS.

FROM THE BOSTON WATER BOARD'S ANNUAL REPORT, DECEMBER 31st, 1886.

Under remarks of water rates: "The operation of the scale of Meter rates adopted last year was found to give takers by Meter a larger proportionate reduction than to others, amounting to more than ten per cent. on the average. It has been ascertained by repeated tests that in Boston the dwelling-house consumption is less than fifty, perhaps less than forty gallons per capita per day. As an example of the other extreme, the much larger consumption in the business districts, necessary to bring up the general average to over seventy gallons, we instance this: —

"In a given section of the city, centrally located, there are in round numbers 1,200 water services, one-third of which are metered, the population by census is about 2,700. The amount of water delivered through Meters alone is equivalent to 550 gallons per capita per day; and the amount of the additional deliveries bring the average up to over 700 gallons.

"An explanation of this great consumption is to be found, not in the extent of the 'manufacturers,' as the district contains but a limited number of manufacturing establishments, but in the fact that it includes several large hotels, restaurants, and places of public resort, and in one way and another it provides every day for the personal requirements as to water, of probably eight or ten times as many persons as have a domicile in the territory. The fact that so large an amount of the water used is metered, would indicate that there was very little waste of water. There are other sections of the city where the consumption, as related to population, would be found so much above the average of the whole city as to present an equally striking contrast with amounts consumed in districts comprising dwellings only.

"(The above explanation of such state of consumption fittingly applies to every large city, hence the importance of thoroughly metering the centrally located section of all cities, if not the entire supply.")

FROM THE BOSTON WATER BOARD'S ANNUAL REPORT, DECEMBER 31st, 1888.

"We advocate the policy of frequent examination of Meters, with a view of keeping them in good running order. In many cities the policy is followed to allow Meters to take care of themselves, but the delicate mechanism of the parts justifies care and supervision if accurate results are to be expected, especially in view of the fact that no Meter has yet been invented which, in our opinion, is entirely reliable; those in service should not be allowed to perform any great length of duty without being taken out for testing. We believe that the policy suggested, if attentively adhered to, will save the city a considerable amount annually in the way of revenue.

During the year 61 Worthington and 113 Crown Meters have been sent to the factory for repairs.

FROM THE BOSTON WATER BOARD'S ANNUAL REPORT, JANUARY 31st, 1893.

GENERAL STATISTICS.

Sudbury and Cochituate Works.	1892.	Mystic Works. 1892.
Daily average consumption in gallons	41,312,400	9,810,800
Daily average consumption in gallons per inhabitant	95·3	78·6
Daily average amount used through Meters, gallons	11,225,900	1,862,200
Percentage of total consumption metered	27·2	19
Number of services	65,074	21,588
Number of Meters and motors	4,412	550
Yearly revenue from water-rates	$1,433,413.78	$394,008.75
Yearly revenue from metered water	$649,672.31	$105,685.56
Percentage of total revenue from metered water	45·3	26·8
Cost of works on Feb. 1, 1893	$22,243,351.56	$1,713,327.00
Yearly expense of maintenance	$350,743.68	$117.922.20

This threatened short supply of Boston's water has been predicted for years past, as will be observed. Had the $280,000 appropriated in 1883, by the city government for the purchase and maintenance of Water Meters been judiciously expended, such a showing would have been made towards checking the waste and thereby increasing the water revenue, that unquestionably Boston would have this day proved the most thoroughly metered city in this country, reaping the greatest returns for money expended, and not now seeking in other states for an additional supply. The Water Meter scandal of 1883–'88 is primarily the cause of the present situation.

FROM BOSTON CITY DOCUMENT No. 39, 1893.

METERS IN SERVICE, JANUARY 31, 1893.

Cochituate.	Diameter in Inches.								Total.
	6	4	3	2	1½	1	¾	⅝	
Worthington	1	10	22	115	98	550	436	78	1,310
Crown	2	18	32	36	80	206	241	1,172	1,787
B. W. W	.....	.....	.....	.....	.....	.....	319	.....	319
Hersey	.....	1	5	11	23	38	76	19	173
Metropolitan	.....	.....	.....	.....	.....	51	242	4	297
Ball & Fitts	.....	.....	.....	.....	.....	1	3	4	8
Thomson	.....	.....	.....	1	1	1	2	6	11
Desper	.....	.....	.....	.....	.....	.....	2	2	4
Nash	.....	.....	.....	.....	.....	.....	.....	2	2
Am. Frost	.....	.....	.....	.....	.....	.....	1	.....	1
	3	29	59	163	202	847	1,322	1,287	3,912

FROM BOSTON CITY DOCUMENT No. 39, 1893.

METERS IN SERVICE, JANUARY 31, 1893.—Continued.

Mystic.	Diameter in Inches.								Total.
	6	4	3	2	1½	1	¾	⅝	
Worthington	.....	10	6	36	7	73	56	9	197
Crown	2	7	8	11	2	32	42	93	197
Hersey	.....	1	.....	3	2	6	.....	.....	12
B. W. W.	.....	.....	.....	.....	.....	.....	1	.....	1
Ball & Fitts	.....	.....	2	1	.....	.....	.....	.....	3
Metropolitan	.....	.....	.....	.....	.....	8	17	.....	25
	2	18	16	51	11	119	116	102	435

METERS PURCHASED.

Cochituate.	Diameter in Inches.							Total.
	6	4	3	1½	1	¾	⅝	
Worthington	1	5	1	5	3	50	.....	65
Crown	1	7	4	26	8	60	.....	106
Hersey	.....	.....	1	.....	.....	.....	.....	1
Metropolitan	.....	.....	.....	.....	62	175	.....	237
Thomson	.....	.....	.....	.....	1	1	2	4
Nash	.....	.....	.....	.....	.....	.....	2	2
	2	12	6	31	74	286	4	415

METERS SENT TO FACTORY FOR REPAIRS.

Cochituate.	Diameter in Inches.					Total.
	2	1½	1	¾	⅝	
Worthington	.....	1	6	1	.....	8
Crown	.....	.....	13	17	72	102
Hersey	1	1	2	3	.....	7
Thomson	.....	1	.....	.....	.....	1
Metropolitan	.....	.....	.....	2	.....	2
	1	3	21	23	72	120

GENERAL STATEMENT OF METERS FOR THE YEAR ENDING JANUARY 31st, 1893.

	Cochituate.		Mystic.	
	Meters.	Boxes.	Meters.	Boxes.
In service, January 31, 1893	3,912	.....	435	.....
New set	210	62	49	14
Discontinued	137	.....	20	.....
Changed	872	.....	89	.....
Changed location	21	.....	1	.....
Tested at shop	1,813	.....	128	.....
Repaired at shop	330	.....	27	.....
Repaired at factory	120	.....	20	.....
Repaired in service	222	31	77	55
Purchased	415	.....	.....	.....

FROM BOSTON WATER-INCOME DEPARTMENT REPORT, FEBRUARY 1st, 1893.

PURPOSES FOR WHICH WATER WAS TAKEN BY ANNUAL RATES.	Totals.	AMOUNTS ASSESSED BY ANNUAL RATES.	QUANTITIES TAKEN BY METER.	Totals. Cubic feet.	AMOUNTS ASSESSED BY METER.
Bakeries	250	$2,999.14	Bakeries	636 000	$852.96
Bath houses	4	165.00	Baths	222,000	302.70
Cattle yards	2	25.00	Boarding houses	1,976,000	2,738 30
Cemeteries	8	75.00	Breweries	20,155.000	24,759.46
Churches	256	2,933.95	Bottling	387,000	537.40
Clubs	118	1,424.58	Cemeteries	204,000	263.40
Depots	44	738.00	Chemical works	4,259,000	5,293.40
Disinfecting places	1	25.00	Club houses	3,710,000	4,651.90
Dwelling houses	58,723	782,674.40	Distilleries	526,000	674.60
Fire Department			Electrical companies	15,641,000	18,149.70
Chemical engines	9	135.00	Elevators and motors	65,279,000	85,068.20
Hose companies	5	75.00	Factories	93,037,000	104,314.17
Hydrants	6,356	22,280.00	Gas companies	17,350,000	19,823 40
Ladder companies	15	225.00	Greenhouses	466,000	659.00
Steam engines	53	1,275.00	Halls	507,000	696.95
Fountains	34	590.00	Hospitals	8,846,000	10,896.72
Freight houses	12	68.00	Hotels	33,250,000	41,141.42
Greenhouses	89	1,155.00	Iron works	4,086,000	5,337.60
Gymnasiums	3	39.00	Laundries	4,473,000	5,746 29
Halls	128	1,817.25	Marble works	1,803,000	2,306.70
Hand hose	9,227	46,270.00	Markets	588,000	801.30
Hospitals	45	2,821.00	Mills and Engines	3,059,000	4,062.80
Hotels	19	894.00	Model houses	35,509,000	47,143.12
Laundries	312	5,675.17	Offices, stores and shops	119,984,000	128,557.34
Libraries	12	194.00	Oil works	842,000	1,012.60
Manufactories	103	1,974.17	Parks	171,000	225.10
Model houses	9,894	187,737.88	Police stations	1,442,000	1,910.10
Morgue	1	10.00	Public buildings	23,514,000	28,845.14
Offal stations	2	225.00	Restaurants	8.041,000	10.606.02
Offices and shops	3,043	32,241.50	Schools	7,166,000	9,780.54
Photograph rooms	14	250.50	Shipping	17,164,000	21,349.85
Police stations	6	105.00	Slaughter houses	18.275,000	18,637.30
Public buildings	10	5,310.00	Stables	15.109,000	20,708.24
Restaurants	192	4.033.58	Stone works	780,000	1,022.00
Saloons	427	13,295.54	Street railways	20.640,000	22,268.20
Schools	133	1,896.75	Steam railways	78,310,000	95,880.91
Shipping	17	983.50	Saloons	5,880,000	8,097.85
Stables	4,704	28,118.51	Tanneries	821,000	1,104.19
Steam engines	167	2,791.50	Theatres	1,762,000	2,235.80
Steam rollers	4	100.00	Wharves	1,942,000	2,569.15
Stone crushers	10	254.00	Fish-packing and stores	890,000	1,232.50
Stores	5,264	50,413.27			
Urinals (public)	35	709.50			
Washing carts	3	275.00			
Watering streets	7	4,682.20			
Totals	99,761	$1,210,080.89	Totals	638.702,000	$762,364.32

Number of takers by annual rates 99,761
Number of takers by Meter 3,827
Number of takers of all kinds 103,588

IN conclusion we would say, that time, trouble and money has been spent in the attempt to insure the greatest accuracy possible in this publication. Every one familiar with such work will appreciate the difficulties attending the gathering of statistics of this character.

We do not hesitate to promise reliable and full records of service of various Water Meters from time to time, believing that such will prove of interest to Water Works Officials.

MELVIN P. FREEMAN,

General Manager.

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