

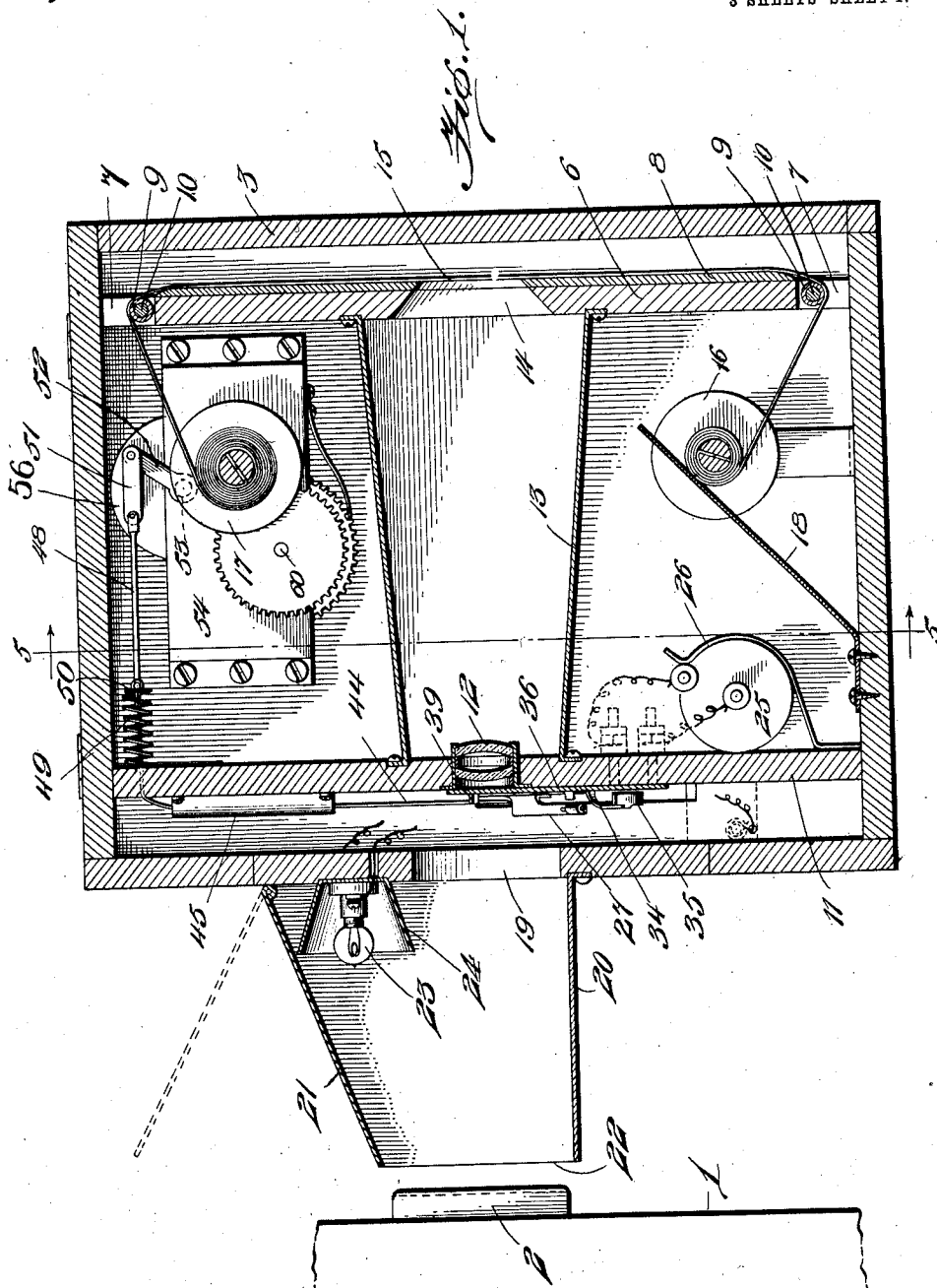
E. C. POND.
PHOTOGRAPHIC METER READER.

APPLICATION FILED MAY 27, 1909. RENEWED APR. 27, 1910.

Patented Nov. 8, 1910.

3 SHEETS—SHEET 1.

975,277.



Witnesses
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 Jas. C. Dodge

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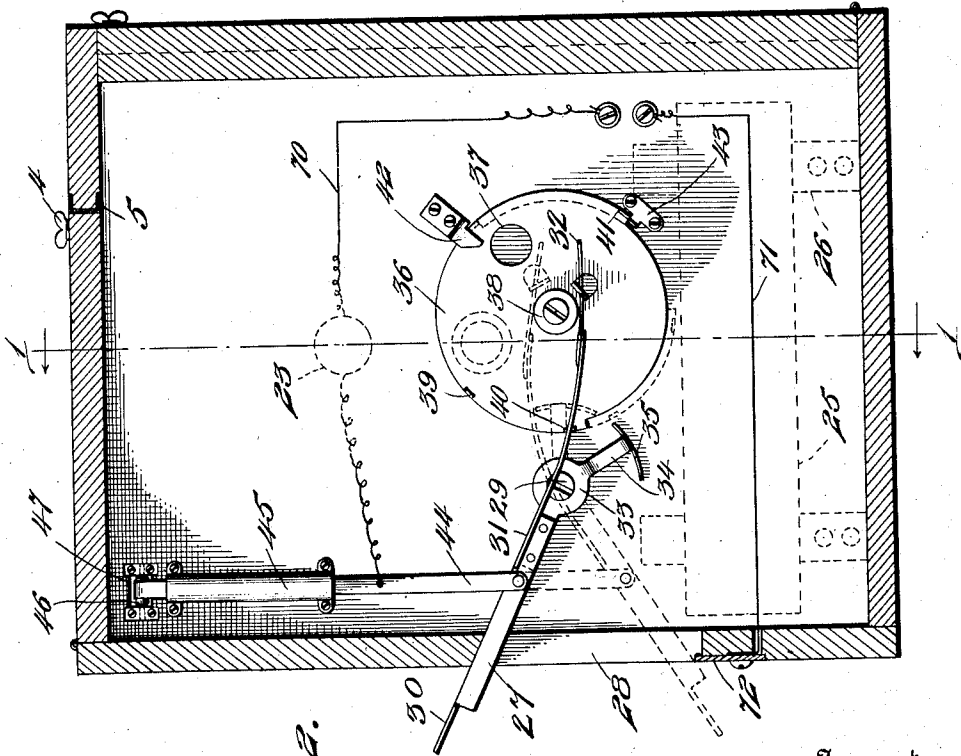
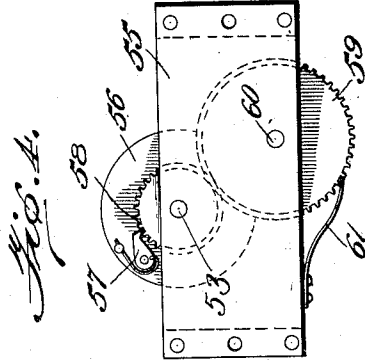
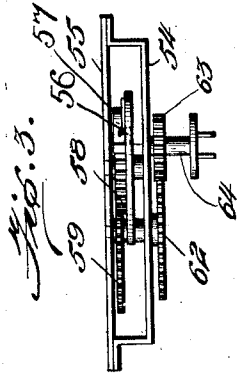
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Fig. 2.

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3 SHEETS—SHEET 3.

Fig. 6.

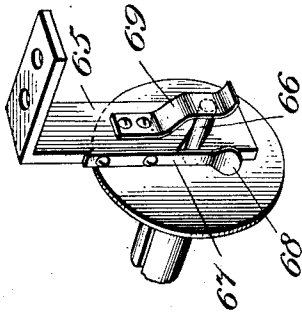


Fig. 7.

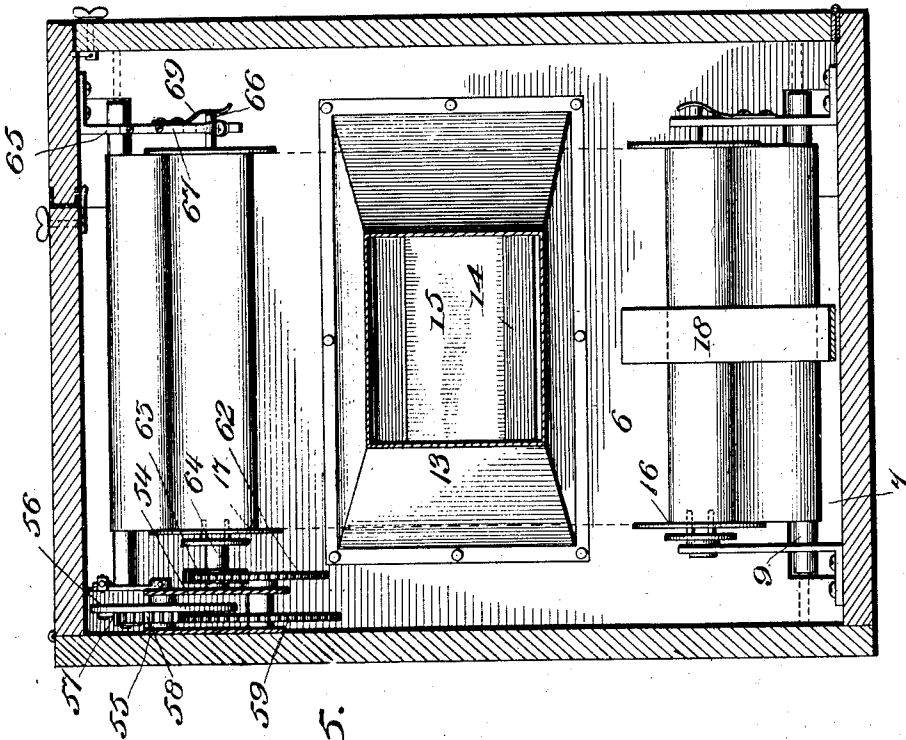
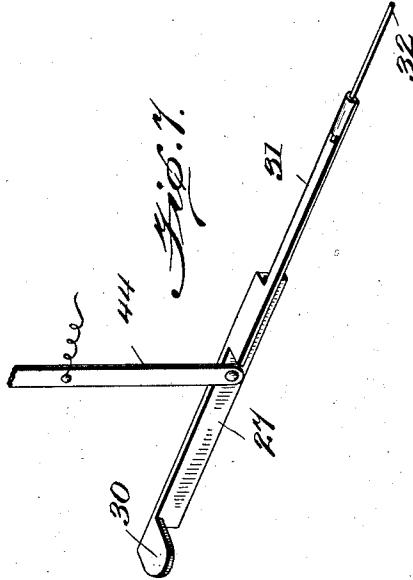


Fig. 5.

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UNITED STATES PATENT OFFICE.

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PHOTOGRAPHIC METER-READER.

975,277.

Specification of Letters Patent.

Patented Nov. 8, 1910.

Application filed May 27, 1909, Serial No. 498,725. Renewed April 27, 1910. Serial No. 558,003.

To all whom it may concern:

Be it known that I, EDWARD C. POND, a citizen of the United States, residing at Petersburg, in the county of Dinwiddie and State of Virginia, have invented certain new and useful Improvements in Photographic Meter-Readers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in photographic meter readers and the object of my invention is to provide a simple device of this character by means of which the indices of gas, water, and electric meters may be readily photographed, making an accurate and infallible copy of said indices, thus preventing errors arising from improper or accidental readings of the same.

With this object in view, my invention consists in the construction and combinations of parts as hereinafter described and claimed.

In the accompanying drawings—Figure 1 is a longitudinal vertical section of my improved device taken on the line 1—1 of Fig. 2, looking in the direction of the arrows. Fig. 2 is a front view of the same with the front parts removed, the casing being shown in section. Fig. 3 is a detail view showing a plan of the operating gearing. Fig. 4 is a rear elevation of the same. Fig. 5 is a cross section on the line 5—5 of Fig. 1, looking in the direction of the arrows. Fig. 6 is a perspective view of one of the bearings for the paper carrying roll, and Fig. 7 is a perspective view of the operating lever.

1 represents a meter which it is desired to read, having a face plate 2 carrying an index and hands or other registering devices.

My invention is portable and is adapted to be placed in any position directly in front of the face plate of a meter, and it can be used in any position—horizontal, vertical, or inclined.

3 represents the casing of the reader, which is provided with removable top, sides, back, and front, which may be attached thereto by hinges or arranged to be slipped out from the main portion of the casing, suitable fastening devices such as 4 being employed to fasten the parts together and suitable packing 5 being provided to keep the joints light-tight. The object of having

parts of the casing removable is that access may be readily had to the interior of the casing to remove and replace the rolls carrying the photographic paper. Near the rear, the casing is provided with a vertical partition 6, having slots at the top and bottom, as indicated at 7. The rear of the partition 6 is provided with a blackened plate 8 or some material preventing the passage of light. In the slotted portions at the top and bottom of this plate are provided rollers 9, mounted on suitable bearings or pins 10, over which the photographic paper passes. Similarly a partition 11 is provided near the front of the casing, which entirely closes the front part of the same except for the lens aperture, and in this aperture is mounted a lens 12, preferably a compound lens. The space between the partition 11 and the back part of the casing, when the latter is closed up, is practically light-tight. The partition 11 is, however, provided with an aperture through which runs the strap for operating the paper, and therefore to prevent any light from reaching the paper roll I provide a casing 13, having its ends firmly secured against the partitions 6 and 11, smallest at the front end where it incloses the lens 12, and largest at the rear end. This casing could be made frusto-conical, if desired, but for convenience in manufacturing I have shown it as composed of four plates shown in Fig. 5, making the casing rectangular in cross section.

The partition 6 and the back plate 8 are provided with a perforation 14, largest at the front as shown, and over this perforation, which is situated directly behind the lens 12, the photographic paper is adapted to run. The end of the perforation nearest the lens is considerably larger than the other end, as shown in Fig. 1.

15 represents the photographic paper, which is adapted to run from the lower spool 16 to the upper spool 17, as is usual in cameras.

18 represents a spring, bearing against the inner part of the lower spool 16 to keep the paper from becoming loose. The paper is fed from the spool 16 to the spool 17 by step-by-step gearing hereinafter described.

The casing is provided with an opening 19 situated directly in front of the lens, and surrounding this opening 19 is a projecting casing 20 open at the front and back, the

rear end being tightly fastened to the front of the casing and the front end being adapted to be placed in immediate proximity to the indicating plate of the meter which it is desired to read. The top part 21 of this
 5 projecting casing is preferably hinged and inclined downwardly, as shown in Fig. 1, so that access to the electric lamp may readily be had. The opening 22 in the front of the
 10 plate is preferably larger than the opening in the rear of the casing surrounding the opening 19, but this is not material.

On the front part of the main casing and located within the smaller casing 20, is an
 15 electric lamp 23, provided with a suitable reflector 24. This is connected in circuit with the poles of a storage battery 25 of any desired form, removably supported in clips 26 in the lower part of the main casing.

When the device is put close to a meter
 20 whose reading it is desired to photograph, by means of a single lever the roll of photographic paper is fed so as to leave an unexposed portion behind the opening 14; the
 25 lamp 23 is lighted; and the shutter in front of the lens 12 is opened, all by the movement of a single lever. This lever is shown detached in Fig. 7 and it consists of a part
 30 27 projecting out through a slot 28 in the side of the main casing and is journaled on a pin or rod 29, and has a thumb piece 30 by means of which it may be easily operated. On the inner part of the lever is a spring
 35 extension 31, terminating in a wire 32, which engages a portion of the shutter to operate it, as hereinafter described. Bolted to the inner end of the lever 27 is a stop, consisting of a portion 33 pivoted on the rod 29 and having an arm 34 terminating in a curved
 40 arm 35, which acts as a stop, as hereinafter described.

36 represents a shutter which is circular in form and provided with an opening 37 adapted to register with the lens 12 when
 45 operated. This shutter is mounted on a rod or shaft 38, located in the casing below the lens 12 and a little to one side thereof, as shown in Fig. 2. The front part of the shutter is provided with extending portions
 50 or lugs 39 and 40, and one edge of the shutter is also provided with another projecting portion 41, which is adapted to strike either one of the stops 42 or 43 fastened on the front of the partition 11 and limiting the
 55 movement of the shutter under the influence of the spring 31 in either direction. From the construction described, it is evident that a downward pressure of the lever 27 as far as it can be pushed will operate the shutter, moving the aperture 37 in front of the
 60 lens 12.

The lever 27 is made of metal which is a good conductor of electricity, as brass, for example. Pivottally attached to the lever
 65 27 near its center is a flexible metal strap

44, which extends through a hollow guide 45, secured on the front of the partition 11. This strap passes upwardly over a roller 46 and through an opening 47 in the partition 11 and operates the paper-carrying rollers, 70 as hereinafter described. To the rear end of the strap 44 is pivottally attached a link 48, and a spring 49 embraces the upper part of the strap 44, resting on one side against the partition 11 and on the other against a 75 collar 50 secured to the end of the strap 44, and normally tends to keep the strap and thereby the lever 27 in the position shown in full lines in Fig. 2. The rear end of the link 48 is pivottally attached to a link 51, 80 the other end of which is attached to a crank arm 52, rigidly mounted on a shaft 53, which shaft is journaled in the main casing and in a bracket 54, having right-angled ends attached to the casing. Preferably a plate 55 85 is provided inside of the casing, the plates 54 and 55 forming a box, as shown in Fig. 3. On the shaft 53 to which the crank arm 52 is attached, is rigidly mounted a disk 56, on one face of which is a spring operated pawl 90 57. On this same shaft 53 is loosely mounted a gear wheel 58, with which said pawl 57 is adapted to engage.

The gear wheel 58 engages with a larger gear wheel 59 on the shaft 60, a spring pawl 95 61 allowing said gear wheel to rotate in one direction but preventing its backward motion, as shown in Fig. 4. On the shaft 60 is fixedly mounted another gear wheel 62, which meshes with a small gear wheel 63 on the shaft 64, on which the spool 17 is detachably mounted, as is usual in cameras. The other end of the spool 17 is detachably mounted in a right-angled bracket 65 secured to the top of the casing, as shown 105 in Fig. 5, and provided with a slot in which the projecting pin 66 of the spool is carried. Over this slot is located a spring 67, having a thumb piece 68, so that the pin 66 may be easily inserted in the slot and securely kept 110 there.

69 represents a bent spring, one end of which is secured to the bracket 65 and bearing against the end 66 of the spool to keep said spool in connection with the operating 115 mechanism.

From the battery 25 a wire 70 runs, passing through the electric lamp 23 and thence connecting with the metal strap 44. From the battery also runs another wire 71, which 120 connects with a metal strip 72 on the outside of the casing and just below the slot 28.

The operation is as follows:—The rolls carrying the sensitized paper having been placed in position, when it is desired to 125 photograph the face plate of a meter, the apparatus is placed in position with the casing 20 in immediate proximity to the face plate of the meter and the lever 27 is pressed down until it strikes the strip 72. The in- 130

stant it strikes this strip 72, the lamp 23 is lighted. The pressing down of the lever 27 exercises a pull upon the crank arm 52, turning the upper spool 17 carrying the paper feeding means a distance greater than the diameter of the rear part of the opening 14, thus leaving a fresh portion of the sensitized paper behind said opening. Meantime the spring portion 31 of the lever 27 is being flexed, as indicated in dotted lines in Fig. 2. The shutter 36 of the camera cannot move, however, at first, because the arm 35 strikes the lug or stop 40. The arm 35 gradually slides by the stop 40 and finally becomes disengaged from it, whereupon the spring 31 instantly swings the shutter so that the opening 37 is in front of the lens 12, the extent of the rotary movement of the shutter being determined by the lug 41, which strikes against the stop 42. The operator holds the lever 27 down in contact with the strip 72 for a brief period, and a photograph of the face plate of the meter is taken upon the strip of paper 15. On releasing the lever 27, the spring 49 pulls it back into its original position, as shown in full lines in Fig. 2, and the spring arm 31 restores the shutter to its original position. This movement of the shutter, however, does not take place until the lever 27 has almost reached its original position, at which time the spring 31 has been flexed as shown in full lines in Fig. 2, because the lug 39 comes in contact with the arm 35 and prevents the movement of the shutter until said arm 35 has passed by the lug, when the shutter is almost instantaneously returned to its original position, that is to say, with the lug 41 in contact with the stop 43.

The whole apparatus constitutes a hand camera provided with an electric lamp.

While I have thus described my invention, I wish it to be distinctly understood that I do not limit myself to the exact details described and shown, as these could be varied widely without departing from the spirit of my invention, the essence of which is that by the pressure of the single lever a fresh portion of sensitized paper may be exposed, an electric lamp lighted, and the shutter moved to uncover a lens, all by a single movement of a single lever, these operations being performed in the reverse order, except that the paper feeding means do not operate, when the lever is released.

For water, gas and electric meters, three distinct machines are used, varying only in

the shape of the casing or hood and the size and arrangement of gears.

I claim:—

1. In a photographic meter reader, the combination of a camera casing provided with a lens and shutter, spools to which a roll of sensitized paper is attached, said paper being adapted to travel from one of said spools to the other, an electric light mounted on said casing, a lever, and connections whereby a single movement of said lever will close said circuit through said electric light and will operate said shutter, a strap attached to said lever, a spring carried by said strap, and gearing whereby the movement of said strap in one direction automatically feeds a certain amount of the film from one spool to the other, substantially as described.

2. In a photographic meter reader, the combination of a casing provided with an electric lamp, a lens and a shutter, a pair of rolls carrying a sensitized film, a lever, and connections for operating said shutter and closing the circuit through said electric lamp, a flexible strap connected to said lever, a spring normally pressing said strap and said lever in one direction, and ratchet gearing connecting one end of said strap with one of the rolls carrying the sensitized film, whereby the movement of said lever will feed a predetermined portion of said sensitized film from one roll to the other, substantially as described.

3. In a photographic meter reader, the combination of a camera casing provided with a lens and shutter, rolls carrying a sensitized film, a lever, and connections whereby the movement of said lever in one direction will feed a predetermined amount of said film from one roll to the other, and connections whereby the movement of said lever will operate said shutter, including a spring attachment to said lever engaging said shutter and stops on said casing, said shutter being provided with suitable lugs and said lever being provided with an extension adapted to contact with some of said lugs and prevent the movement of said shutter until the proper instant, substantially as described.

In testimony whereof, I affix my signature, in presence of two witnesses.

EDWARD C. POND.

Witnesses:

A. W. KENDALL,
LYMUND B. COOK.