

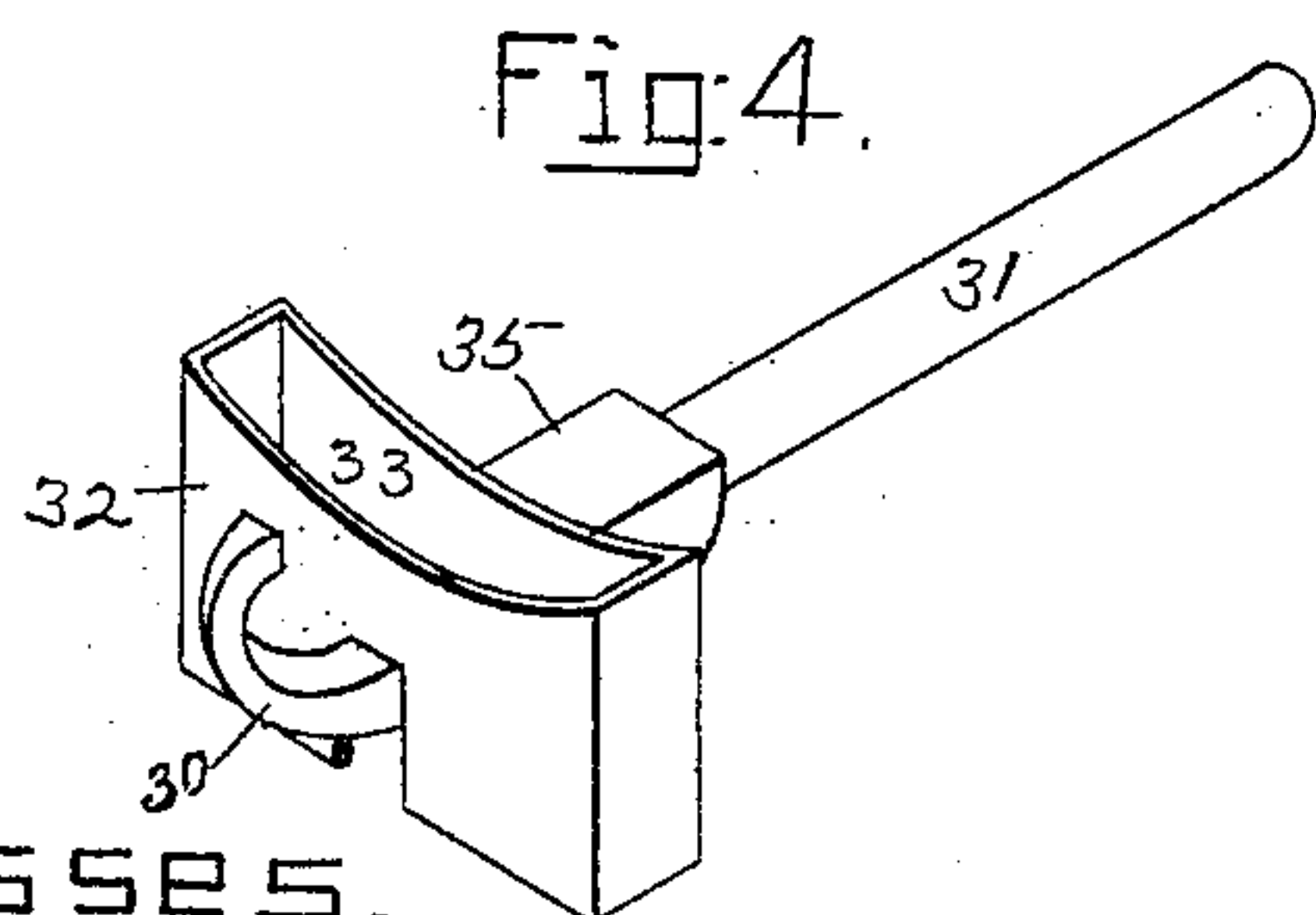
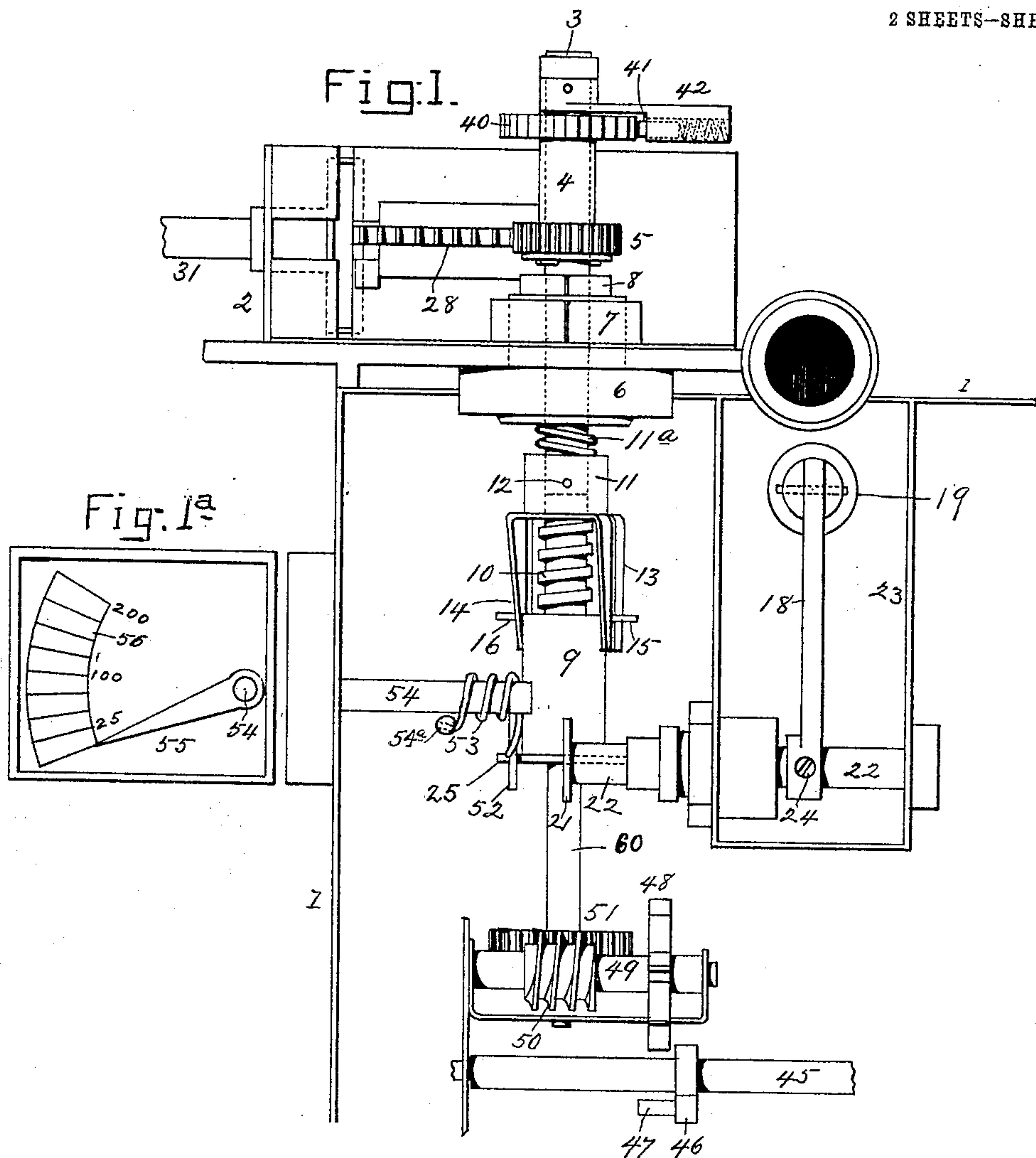
No. 815,945.

PATENTED MAR. 27, 1906.

J. DOYLE & C. F. AVERILL.
COIN ATTACHMENT FOR PREPAYMENT METERS.

APPLICATION FILED MAR. 31, 1903.

2 SHEETS—SHEET 1.



Witnesses.
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2 SHEETS—SHEET 2.

Fig. 2.

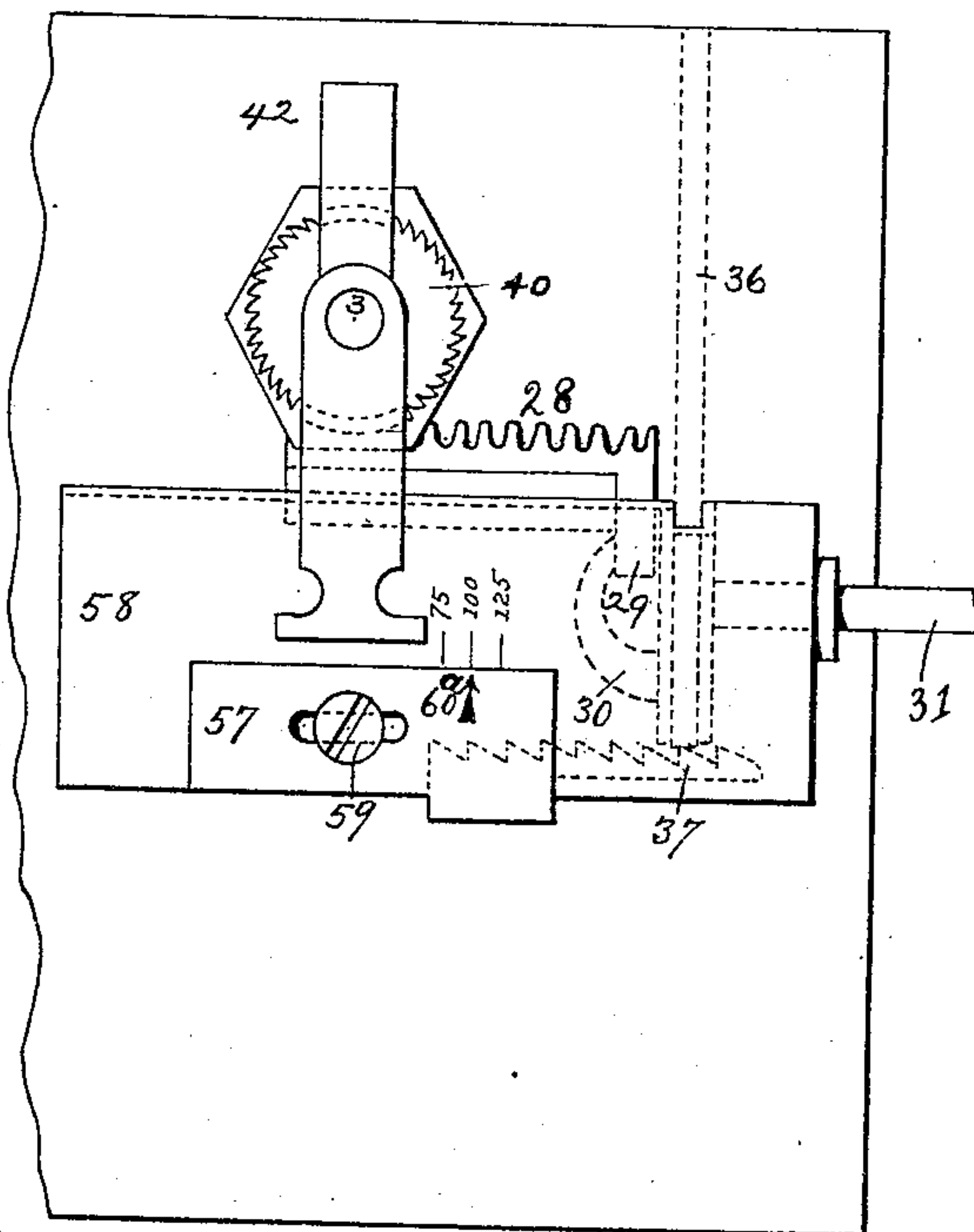
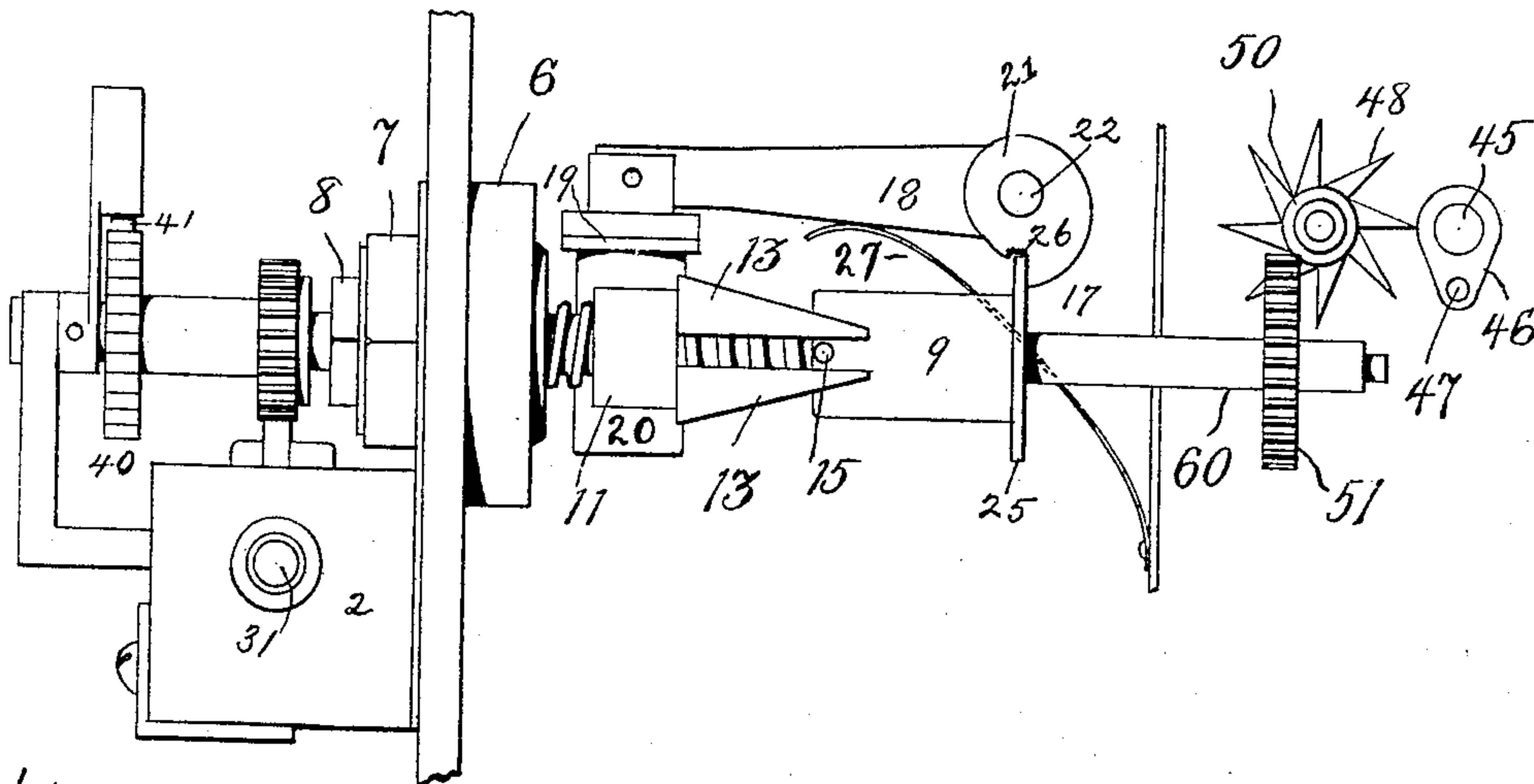


Fig. 3.



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UNITED STATES PATENT OFFICE.

JOHN DOYLE AND CHARLES F. AVERILL, OF NEW YORK, N. Y.

COIN ATTACHMENT FOR PREPAYMENT-METERS.

No. 815,945.

Specification of Letters Patent.

Patented March 27, 1906.

Application filed March 31, 1903. Serial No. 150,368.

To all whom it may concern:

Be it known that we, JOHN DOYLE and CHARLES F. AVERILL, citizens of the United States, and residents of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Coin Attachments for Prepayment-Meters, of which the following is a specification.

Our invention relates to improvements in meters; and it is applicable to any class of meters in which the indicating or registering mechanism is actuated, whether by fluid-pressure or by the effects of an electric current, through the rotation of one or more shafts. It is characteristic of such meters that they expend at least a portion of the pressure exerted by the fluid or other material or energy on its way to the point or points of consumption in operating through one or more diaphragms or other devices a system of shafts which control the counter, the rotation of the secondary shafts being caused by the action of the diaphragms or other devices upon the units-shaft. To all such meters our invention can be applied without interference with the correct normal operation thereof.

The special features of our invention are, first, that the coin which is dropped into the apparatus before starting when once deposited and moved the slightest distance toward its receptacle cannot be withdrawn; second, that the coin itself plays no direct part in the opening of the gas-valve, (in case the attachment is applied to a gas-meter,) being dropped into its receptacle before such valve is operated and before any gas is delivered; third, that the return of the push-rod after having carried the coin to the point where it falls into its receptacle opens the gas-valve by rotating a nut upon a threaded shaft and causing a longitudinal movement of the nut along the shaft; fourth, that the closure or restoration of the gas-valve is brought about by the intermittent action of a crank-arm on the units-shaft upon a spur-wheel, the combined effect being to operate a worm-gear by means of which the shaft carrying the nut is rotated to reverse the longitudinal movement of the said nut; fifth, that by virtue of this arrangement the opening of the gas-valve may take place quickly under the full force of the operator's hand and without any disturbance of the more delicate parts of the meter apparatus, while the parts

which are to be operated through the units-shaft to restore original conditions are always the same parts, occupying the same relation and requiring the same slight application of force to move them; sixth, that the attachment as a whole is of simple and inexpensive construction and can be readily and securely attached to the meter in such a way as to prevent leakage, a suitable packing being employed and no solder, as is now customary; seventh, that without the addition of structural parts and without any difficult adjustment the device can be arranged to suit different prices of the material or energy to be consumed; eighth, that the consumer cannot obtain a supply of the material or energy to be consumed without actually depositing a standard coin or its equivalent in size; ninth, that the amount of money paid in or the amount of gas or other material or energy to which the consumer is entitled is indicated upon a dial in plain sight of the consumer, and, tenth, that the amount which the consumer may safely pay in is not limited to a single coin, but may run up to eight coins, or even more, depending upon the adaptability of the special apparatus supplied to the consumer.

Should the meter to which our attachment is applied be an electric meter, the movement of the nut in one direction might be made to operate a switch of suitable character, while the movement of the nut in the opposite direction, due to the action of the units-shaft upon the nut-carrying shaft, might be made to reverse the switch.

Our invention is illustrated in the accompanying drawings, in which—

Figure 1 is a diagrammatic plan view of a gas-meter having our coin attachment applied thereto. Fig. 1^a is a face view of the coin-scale to indicate value of coins deposited. Fig. 2 is a diagrammatic end view of a portion of the attachment. Fig. 3 is a diagrammatic side view of the main operating portions of the apparatus, and Fig. 4 is a detail view.

Referring to the drawings, 1 1 represent one of the walls of a gas-meter of ordinary construction. The casing of our attachment is shown at 2, and it incloses certain operating parts presently to be described. Through the casing and into the open space at the top of the meter extends a shaft 3, on which is mounted a sleeve 4, carrying a pinion 5. The shaft 3 extends through the wall or casing of

the meter, and leakage is prevented by means of a stuffing-box 8 and a nut 7, which holds the casing 2 in position in combination with the collar 6. Toward the inner end of the shaft 3 and in alinement therewith is a shaft 60, on which is a nut 9, which is adapted to engage internally with a screw-thread 10 on the said shaft 60.

A hub 11 is secured by a pin 12 to the forward end of the shaft 3 and is provided with fingers 13 14, arranged in pairs on opposite sides of pins 15 and 16, projecting from the nut 9. By rotating the hub 11 through the rotation of the shaft 3 the nut 9 may also be rotated, so as to change its longitudinal position upon the shaft 60, one end of which is journaled in the hub 11. The nut 9 is adapted to cooperate, as shown in Fig. 3, with a cam 17, forming, in effect, an angular extension of a lever 18, controlling the gas-valve 19. As shown in Fig. 3, the gas-valve is closed and no gas is flowing through the pipe 20, which is the inlet-pipe to the meter.

Upon the shaft 3 and located between the hub 11 and the casing is an expansive coil-spring 11^a, the ends of which respectively abut the casing and the hub, the function of said spring being to thrust the shaft 3 inwardly and resist any endwise movement thereof which may occur incident to the operation of the machine and also to urge the shaft 3 and hub 11 toward the threaded shaft 60, so that the forward end of the latter will always have a secure bearing in said hub.

The details of the arrangement last described are more fully shown in Fig. 1, where the part on which the projection or cam 17 is formed is shown as a ring 21 on a suitable shaft 22, which extends through packing devices into a separate chamber 23. The arm 18 is secured to the shaft 22 by a set-screw 24.

On the nut 9 is formed a flange 25, which is adapted in one of its extreme positions to engage with the cam or projection 17 and close the gas-valve 19. This is the position which the parts occupy when the supply of gas due to the consumer is exhausted and before a new coin has been deposited. The means by which the parts are brought into this position will be described further on. It is only necessary to add at this point that the flange 25 when the gas-valve is fully seated lies in a little notch 26 in the ring 21, so that when the nut is moved away to open the valve, as will presently be described, it tends to give a little throw to the ring for starting the rotation of the shaft 22 in the proper direction to open the valve. The return of the valve except by means of the nut engaging with the cam is prevented by a spring 27 within the chamber 23. This spring also serves to lift the valve to full-open position after the arm 18 is initially moved upward by the longitudinal movement of the nut 9.

Returning now to the attachment mechan-

ism, it will be seen that a rack 28 is adapted to engage the pinion 5, such rack having a downward projection 29, as shown partly in dotted lines in Fig. 2. This rack is adapted to slide back and forth in suitable guides under the influence of pressure. Cooperating with the said projection 29 is a finger 30, which is connected with the push-rod apparatus. The push-rod itself is shown at 31, and it carries on its inner end a pocket 32, having an opening 33 to receive a suitable coin. This pocket is cut away at the top, so as to slide underneath the projection 29 without moving the same whenever the push-rod is pushed inward without any coin. Accordingly the rod may be pushed in and pulled out without any effect whatever upon the apparatus so long as no coin has been deposited in the pocket 32. Between the pocket and the round portion of the rod 31 is a squared piece 35, the function of which is to insure that when the rod is pulled out as far as it will go the pocket shall be directly under the mouth of a coin-duct 36, extending down through the attachment from the top thereof. Below the pocket 32 or below the open lower end thereof is arranged a ratchet-toothed bar 37, against which the coin drops on being put in the coin-duct. This ratchet-bar has a certain definite length, and beyond where it ends the coin is free to drop into a receptacle at the bottom of the attachment.

From the foregoing description it is evident that the push-rod will not affect the rack-bar unless a coin shall have been deposited in the pocket 32 of sufficient diameter to extend above the top of the pocket and engage the projection 29. In that case the coin itself will press against the said projection when the rod is pushed inward and will carry the rack-bar along with it. This carrying effect will cease, however, as soon as the coin reaches the end of the ratchet-bar 37, because the coin will then drop out of the way and the push-rod will no longer have any effect toward moving the rack-bar inward. When, however, the rod is pulled out again, the finger 30 will engage the projection 29 and pull the rack-bar back to its original position. Now the rack-bar itself during its inward movement does not affect the interior apparatus of the meter, since the pinion 5 is mounted on a sleeve which is loose upon the shaft 3. During the return movement, however, the pinion 5, through the medium of a ratchet-wheel 40 on the opposite end of the sleeve 4 and through a spring-pressed pawl 41, engaging with the said ratchet-wheel, operates the shaft 3 through a pawl-holder 42, attached thereto. This movement is in such a direction as to move the nut in a longitudinal direction upon the shaft 60 away from the cam or projection 17. The first effect of the movement is to exert a slight pull through the action of the flange 25 upon the wall of the

notch 26, thus starting a rotation of the shaft 22 in a direction calculated to open the gas-valve 19. When the movement of the rack-bar is completed, by pulling out the rod 31 to its full extent the nut 9 will have been moved completely away from the projection 17 and the gas will begin and continue to flow. Assuming that the coin deposited in the coin-duct is a silver quarter-dollar, the distance to which the nut is moved away will be sufficient to allow twenty-five cents' worth of gas to pass through the meter before the nut is restored through the action of the gas itself. This action takes place through the effect of the units-shaft 45 by means of intermediate mechanism upon the shaft 60. It will be understood that as soon as gas begins to flow the units-shaft begins to rotate, indicating or registering upon suitable dials (not shown) the number of feet of gas passing through the meter. On the units-shaft I mount a crank-arm 46, from which a pin 47 projects once during each revolution of the units-shaft. The pin 47 strikes one of the teeth of a star-wheel 48, mounted on a shaft 49, carrying a worm 50. The said worm in its turn engages a worm-wheel 51 on the shaft 60 and by its rotation causes a rotation of the said shaft 60. The direction of rotation of the shaft 60 is such as to cause the nut 9 to move inward toward the cam or projection 17. When the proper amount of gas corresponding to the coin deposited has nearly passed through the meter, the flange 25 strikes the projection 17 and forces the gas-valve toward its seat through the intermediate devices, consisting of the ring 21, the shaft 22, and the arm or lever 18. At the proper time the valve is brought to its seat and the flow of gas ceases. Arranged in engagement with the flange of the nut 9 is a rod or arm 52, which is secured to and projects laterally from a rotatable shaft 54, suitably journaled in the casing. This shaft projects through the wall of the meter-casing and carries on its outer end an indicating finger or pointer 55, which passes over a scale 56, indicating the value of the coins deposited by the consumer. This scale might, if preferred, indicate the number of feet of gas instead of the value of the coins. Coiled round the shaft 54 is an expansive spring 53, having one end anchored to a stud or part 54^a, mounted in the casing, and the opposite end bearing on said arm or rod 52 to constantly urge the latter into engagement with the flange 25 on the nut 9, said spring also serving to rotate the shaft 54 to swing the pointer forward on the scale. When the nut 9 is drawn forward to set the meter, it will be seen that the flange 25 will be moved toward the shaft 54, permitting the spring to throw the rod 52 downward, and thereby rotate the shaft to move the pointer, so as to indicate outside of the meter a number of feet to which the consumer is entitled or the

amount of coin deposited, as the case may be. The return movement of the nut 9 carries the flange 25 along the rod 52, so as to raise the latter and swing the pointer back to zero in a manner which will be obvious.

The scale shown in Fig. 1 provides indications for eight silver quarters, this being the limit for which the apparatus illustrated is designed. It is evident that after a single coin has been deposited and the rack-bar has been operated in the manner described another coin may be put in and the rack-bar again operated. This process must, however, stop when the end of the hub 11 is brought against the wall of the meter or against the packing inside the wall. The consumer will be instructed how many coins he may safely deposit when the apparatus is put in his charge. Manifestly, however, the device can be adjusted to receive any reasonable number of coins, either eight, as in the present instance, or more or less than eight.

In this apparatus provision is made for protecting the consumer in case he should deposit a number of coins simultaneously in the coin-duct. It has already been said that the top of the pocket 32 is cut away. In practice the top of the pocket is rounded, as shown in Fig. 4, and the lowermost part of the depression comes on a level with the summit of the squared portion 35 and the rod 31. It follows that no loss will be incurred and no derangement of the apparatus will take place no matter how many coins are deposited in the coin-duct at the same time. When the pocket is pushed inward, the lowermost coin, which is inside the pocket, will be carried along and do its work of setting the starting apparatus, after which the return of the pocket will operate the meter, and when the pocket reaches its extreme outward position the coin which is then lowermost will drop into the pocket and the operation can then be repeated.

Connected with the ratchet-bar 37 is an extension 57, which is turned upward outside the box 58, in which the ratchet-bar is contained, and is provided with a slot through which a set-screw or thumb-screw 59 is adapted to pass. By means of the slot and set-screw described the ratchet-bar 37 may be adjusted so as to bring its inner end either to the right or to the left of the position illustrated in Fig. 2. Such adjustment provides, as already indicated, for adapting the device to different prices of the gas or other material or energy consumed.

An indicator 60^a on the extension 57 in connection with a scale showing prices on the box 58 serves to show the proper position or adjustment of the ratchet-bar to correspond to the different prices.

We claim as our invention—

1. In a coin attachment for meters, the combination with means for controlling en-

ergy, of a shaft, a hub rigidly mounted on said shaft to rotate therewith, a threaded shaft in longitudinal alinement with said first-named shaft and rotatable independently thereof, a nut on said threaded shaft provided with a projection, an arm on the hub having a slot to receive said projection and means operable by the movement of the nut to actuate the energy-controlling means.

10 2. In a coin attachment for meters, the combination with mechanism operating to cut off a flow of energy at a predetermined point, and including a rotatable shaft, a pinion mounted thereon, means to permit the
15 pinions to rotate independently of the shaft in one direction and to cause them to rotate together in the opposite direction, a reciprocatory rack-bar engaging the pinion and having a depending projection, a sliding pusher
20 carrying a bottomless coin-pocket, to receive a coin which engages the rack-bar on the inward movement of the pusher to move the

rack-bar in one direction, a plate beneath the coin-pocket to maintain the coin in the pocket and in engagement with the rack-bar, 25 a support for the bar, an extension on the plate engaging the support and having a slot, a set-screw engaging the slot and the support whereby the plate is adjustable to determine the release of the coin from the pocket, and a 30 loop on the pocket adapted to engage the projection on the rack-bar on the outward movement of the pusher whereby the pinion is rotated to set the controlling means for operation. 35

Signed at New York, in the county and State of New York, this 24th day of March, A. D. 1903.

JNO. DOYLE.
CHARLES F. AVERILL.

Witnesses:

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