No. 863,225. PATENTED AUG. 13, 1907.

E. SCHATTNER.

PREPAYMENT MECHANISM.

APPLICATION FILED DEC. 2, 1904.

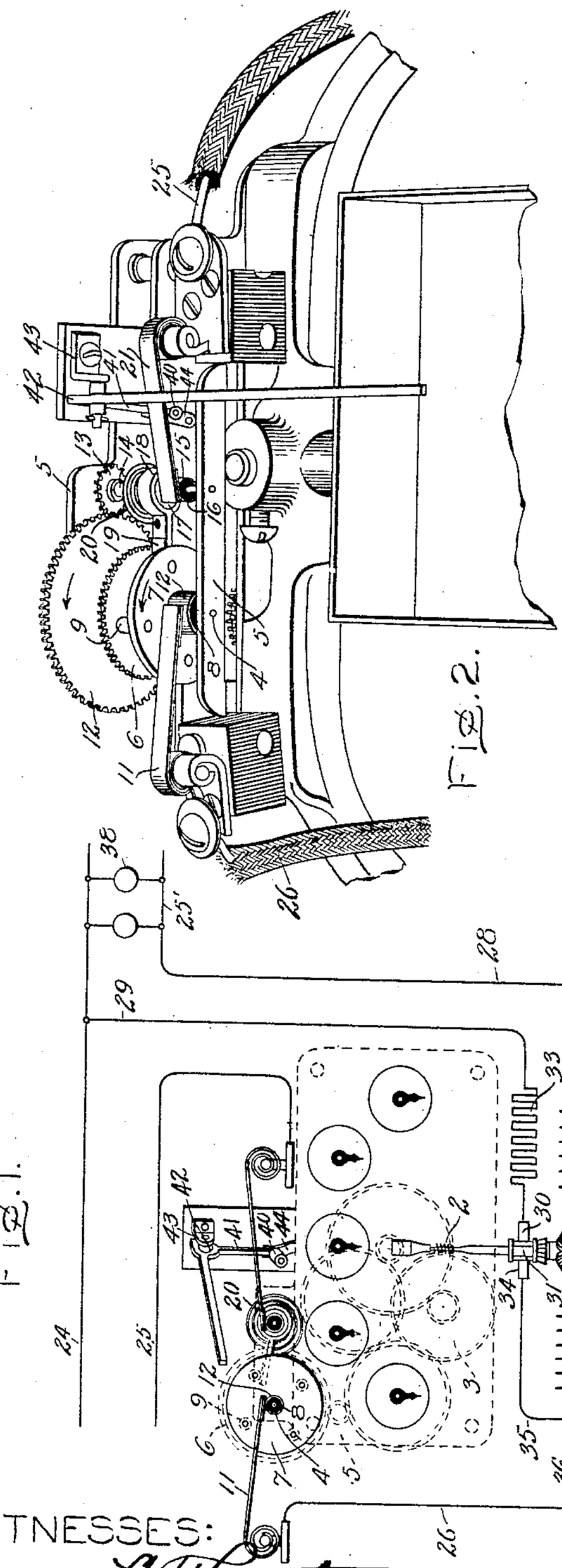

Fig. 2.

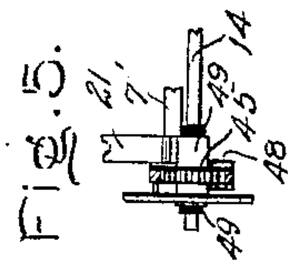

Fig. 5.

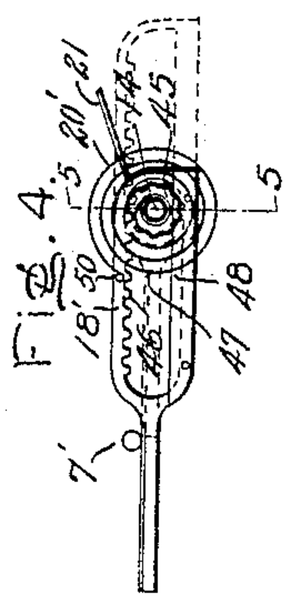

Fig. 4.

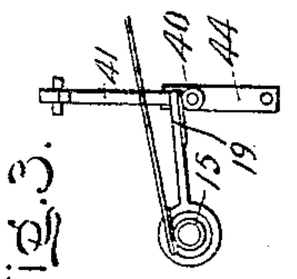

Fig. 3.

Fig. 1.

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UNITED STATES PATENT OFFICE.

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PREPAYMENT MECHANISM.

No. 863,225. Specification of Letters Patent. Patented Aug. 13, 1907.

Application filed December 2, 1904. Serial No. 235,149.

To all whom it may concern:

Be it known that I, ERNEST SCHATTNER, a subject of the King of Great Britain, residing at Schenectady, county of Schenectady, State of New York, have invented certain new and useful Improvements in Prepayment Mechanisms, of which the following is a specification.

My present invention relates to prepayment mechanisms particularly adapted for the control of electric circuits.

In carrying out my invention I have arranged a movable contact device which is connected to an operating member by a spring or other elastic means. The contact device is moved by the elastic means connecting it to its operating member into engagement with a second contact device or member when a coin is inserted in the mechanism. The engagement of the two contact devices serves to close an electrical circuit. While the two contact devices are in engagement a relative movement between the first contact device and its operating member occurs which puts the elastic connecting means under tension sufficient after the engagement between the contact device is broken to move the first mentioned contact device first into an inoperative position and then after the insertion of another coin in the apparatus to again bring about an engagement between the contact devices.

The engagement between the two contact devices is broken by reason of relative movement between them which may be produced in any suitable manner dependent on the nature of the organization of which they form a part. In the construction which I have hereinafter illustrated and described in detail this relative movement is produced by the flow of current through the circuit controlled by said contact devices. The relative movement may, however, be produced in other ways. The mechanism described above insures a quick making and breaking of the engagement between the two contact devices and consequently of the circuit controlled by them. Moreover, the novel mechanism which I have devised for the purpose is simple and reliable, and is such as to require a very small amount of power to accomplish the operation described.

The various features of novelty which characterize my invention are pointed out with particularity in the claims annexed to and forming a part of this specification. For a better understanding of my invention, however, reference may be had to the accompanying drawings and description in which I have illustrated and described one of the forms in which my invention may be embodied.

Of the drawings, Figure 1 is a view partially in sectional elevation and partially in diagram showing my invention employed in conjunction with a motor meter to control the consumption of energy in an electric circuit; Fig. 2 is a perspective view showing a portion of the mechanism of Fig. 1 on a larger scale; Fig. 3 is a sectional elevation taken similarly to Fig. 1 showing the mechanism in a different position; Fig. 4 is an elevation showing a portion of a modified construction; and Fig. 5 is a section on the line 5 5 of Fig. 4.

In the drawings, 1 represents the shaft of a motor meter of the well known Thomson recording wattmeter type. The upper end of this shaft carries a worm 2 which meshes with one of the wheels of the ordinary counting train 3 employed in meters of this character. A shaft 4 is journaled in plates 5 which may be either parts of the frame work used for supporting the ordinary counting frame or be secured thereto. The shaft 4 has rigidly secured to it a gear wheel 6 which meshes with one of the wheels of the train 3. A contact device in the form of a metal disk 7 secured to the shaft 4 but insulated therefrom by a bushing 8 of insulating material is provided with a number of metal pins 9 which project from one side of the disk and are equally spaced about the shaft 4. A contact brush 11 fixed at one end to the frame work of the meter, bears yieldingly against the hub 12 of the disk 7. The shaft 4 has secured to it a gear wheel 12. The gear wheel 12 meshes with a gear wheel 13 rigidly secured to the shaft 14 which may also be mounted in the supports 5. A collar 15 is rigidly secured to the shaft 14 but is insulated therefrom by a bushing 16 of insulating material. On a portion 17 of this collar is loosely mounted a contact member 18 provided with an extending arm 19. A spiral spring 20 has its inner end secured to the collar 15 and its outer end secured to the arm 19. A contact spring or brush 21, similar to the contact spring or brush 11, having one end secured to a fixed support on the frame work of the meter, bears against the collar 15.

Referring particularly to Fig. 1, 24 and 25 represent conductors which supply electric energy from a suitable source. The conductor 25 is connected to the brush 21. A conductor 26 connects the brush 11 to one terminal of the main field coil or winding 27 of the meter. The other terminal of the field coils 27 is connected by a conductor 28 to the conductor 25′. A conductor 29 connects the conductor 24 to one of the brushes 30 engaging the commutator 31 connected to the armature 32 carried by the shaft 1. The conductor 29 may include a suitable regulating resistance 33. The other brush 34 engaging the commutator 31 is connected to the conductor 26 by a conductor 35. The conductor 35 may include the winding of the auxiliary field coil or starting coil 36 of the meter.

In the position of the parts shown in Figs. 1 and 2 in which the arm 19 engages one of the pins 9, the brushes 11 and 21 are electrically connected through the collar 15, collar 18, arm 19, pins 9, disk 7, and hub 12, and

when so connected suitable electrical energy is supplied to the translating devices 38 by the conductors 24 and 25′, and the energy consumption is measured by the revolutions of the armature shaft 1 in the usual manner. In order to make good electrical connections the under side of the tips of the brushes 11 and 21 and the upper side of the arm 19, the pins 9, the hub 12 and the collar 15, may be formed of or plated with some good conducting metal such as silver.

The revolutions of the armature shaft 1 through the gearing 3 cause the gear wheels 13 and 12 to revolve in the direction indicated by the arrows shown in Fig. 2. Upon a sufficient relative movement between the wheels 12 and 13 the member 19 will be released by the pin 9 with which it is shown in engagement and will be moved by the spring 20 into the position shown in Fig. 3, where its outer end is shown in engagement with a coin-controlled stop or lock in the form of a projection 40 carried by the lower end of the short arm 41 of a bell-crank 42 pivoted to a projection 43 from one of the supports 5. A spring 44 normally holds the projection 40 in a position in which it prevents further angular movement of the arm 19. When, however, the outer end of the long arm of the bell-crank lever 42 is depressed by the impingement against it of any suitable coin delivering or inserting mechanism, the arm 19 moves into engagement with the pin 9 immediately to the right (having reference to the direction of rotation of the shaft 4) of the pin previously engaged, thus again establishing electrical circuit between the brushes 11 and 21 which had been broken by the preceding disengagement between the arm 19 and the pin 9. It will, of course, be understood that the angular movement of the pin 9 between the instant at which it is first engaged by the arm 19 and the moment of disengagement corresponds to the revolutions of the armature shaft sufficient to measure the consumption of the energy purchased by the insertion of a coin. It will also be understood that the teeth on the gears 12 and 13 are so proportioned that the shaft 14 makes one complete revolution while the arm 19 is in engagement with one of the pins 9.

In the form of my invention shown in Fig. 4 of the drawings, the movable contact device 7 is replaced by a stationary contact device 7′ which may be permanently connected to one terminal of the conductor 26. A spur gear 45 is carried by and insulated from the shaft 14. The teeth of the gear 45 mesh with gear teeth 46 formed at one side of a slot 47 in a contact member 18′ corresponding in function to the contact member 18 of the construction described above. Guide pieces 48 secured to sides of the member 18′ and engaging cylindrical extensions 49 from the spur gear 45 serve to properly position the member 18′ with the teeth of the spur gear 45 meshing with the teeth 46. It will be observed that the member 18′ is insulated from the shaft 14. A helical spring 20′ similar to the spring 20 has one end secured to the member 18′ at the point 50. The other end of the spring is secured to one of the extensions 49. The spring or brush 21 bears against the other extension 49.

In the position of the apparatus shown in Fig. 5 the arm 18′ has just been released by the coin-controlled lock which may be identical in construction with that of the construction shown in Figs. 1 and 2, and has been moved into engagement with the contact device 7′ under the action of the spring 20′. As the shaft 14 rotates under the action of the meter the spring 20′ will be put under tension and the arm 18′ will be moved to the right by reason of the engagement between the teeth of the gear 45 and the teeth 46. The movement of the member 18′ to the right is continued until the member reaches the dotted line position when it is no longer retained by the contact device 7′ and will turn about the shaft 14 under the action of the spring 20′ until it engages the coin-controlled stop. When it is again released from the coin-controlled stop it will again move into engagement with the contact device 7′. The rotation of the member 18′ about the shaft 14 in the manner described will, by reason of the engagement between the teeth of the spur gear and the teeth of the member, cause the member to be moved again into the position shown in full lines in Fig. 5.

While the mechanism described above is simple, efficient and reliable, it will be readily undertood by all those skilled in the art that many changes may be made in the form of the invention disclosed without departing from the spirit of my invention.

What I claim as new, and desire to secure by Letters Patent of the United States, is,—

1. In combination, a rotatable shaft, a contact member connected thereto, elastic means connecting the shaft and member and tending to cause the contact member and shaft to rotate at the same average angular velocity, and a contact device arranged to engage, retard, and release the contact member once during each revolution of said shaft.

2. In a prepayment device, a contact device, a rotating shaft, a contact member loosely mounted thereon and engaging said first mentioned contact device to close an electric circuit, a spring having one end secured to said shaft and the other end to the contact member carried thereby under sufficient tension to rotate said movable contact device away from its position of engagement with the contact device when released by it and again into engagement with said device, and a coin-controlled lock normally in a position to prevent the engagement of the member and device.

3. In combination, a contact device, a contact member pivoted eccentrically to the device and engaging it to close a circuit, mechanism for causing an engagement between the contact device and contact member, said mechanism including resilient means tending to rotate said contact member when disengaged back to the position of engagement with the contact device, and coin controlled means for normally preventing such movement.

4. In combination, a supporting member, a contact member movably secured thereto, a spring tending to prevent relative movement in one direction between the contact member and the support, a contact device, and means for causing an engagement between the contact device and said contact member which produces relative movement between the contact member and support against the action of the spring, whereby when the engagement between the contact device and contact member is broken said spring will produce a quick movement of the contact member.

5. In combination, an electric meter, a pair of contact members engaging one another to close a circuit through said meter, means for breaking engagement between said contact members, a spring acting to produce a quick separation of said members when the engagements between them is broken, and means controlled by the meter for putting the spring under tension.

6. In combination, a meter, a pivotally mounted contact member, a spring tending to rotate the contact member about its point of support, a coin-controlled means normally engaging the contact member and holding it in an inoperative position but adapted to release said contact member upon the insertion of a coin, a contact device adapted to engage the contact member and retard its rotation, means operated by the meter for causing the engagement between the contact device and member to be

broken after a predetermined amount of current has passed through the circuit controlled by them, and for putting the spring under sufficient tension to move the contact member when released from the contact device into engagement with the coin-controlled means and for thereafter moving the contact member again into engagement with the contact device when the insertion of a coin shall cause the coin-controlled means to release the contact member.

7. In a prepayment electric meter, a rotating contact device provided with teeth, a shaft rotating faster than the device, a contact member movably connected thereto, a spring connecting the contact member and the shaft to cause them to rotate with the same average angular speed said contact member being arranged to engage and to withdraw from one of the teeth of the contact device once each revolution of the shaft.

8. In an electric prepayment metering device, a pair of contact members, engaging one another on the insertion of a coin, a spring acting on one of said members to produce a quick separation betwen the members when engagement between them is broken, and means actuated by the meter for putting the spring under tension while the contact members are in engagement.

9. In an electric prepayment device, a pair of parallel shafts, means for turning said shafts in opposite directions and with different angular velocities, a contact device rigidly mounted on one of said shafts and a contact member movably mounted upon the other of said shafts, said contact member engaging said contact device once during each revolution, elastic means for connecting said contact member and the shaft upon which it is mounted, said elastic means being normally under tension, and means for normally holding said loosely mounted contact member out of engagement with the contact device, said means releasing said member and allowing it to move in engagement with the contact device upon the insertion of a coin in the apparatus.

10. In an electric prepayment device, an electric meter, a pair of parallel shafts driven thereby, said shafts rotating in opposite directions and with different angular velocities, a contact device in the form of a toothed wheel rigidly secured to one of said shafts, a contact member loosely mounted on the other of said shafts, a spring having one end connected to said contact member and the other end secured to the shaft upon which it is mounted, and a coin-controlled lock normally engaging said contact member and holding it out of engagement with said contact device but adapted upon the insertion of a coin to release said contact member whereupon the latter is moved into engagement with one of the teeth on said contact device through the action of said spring.

11. In an electric prepayment mechanism, a meter, a pair of parallel shafts connected thereto by gearing, so that the revolutions of the meter will cause the shaft to turn in different directions and with different angular velocities, a contact device in the form of a toothed wheel mounted on and turning with the slowest turning shaft, a contact member loosely mounted on the other of said shafts, and a spring normally under tension having one end connected to said contact member and the other end connected to the shaft on which it is mounted, a coin-controlled lock normally engaging said contact member and holding it in a position out of engagement with the teeth on said contact device but adapted upon the insertion of a coin to release said contact member whereupon it is moved by the spring into a position in which it engages one of the teeth on said contact device.

In witness whereof, I have hereunto set my hand this 30th day of November, 1904.

ERNEST SCHATTNER.

Witnesses:
BENJAMIN B. HULL,
HELEN ORFORD.