No. 616,090. Patented Dec. 20, 1898.

T. DOUGLASS.

MOTOR.

(Application filed Feb. 21, 1898.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

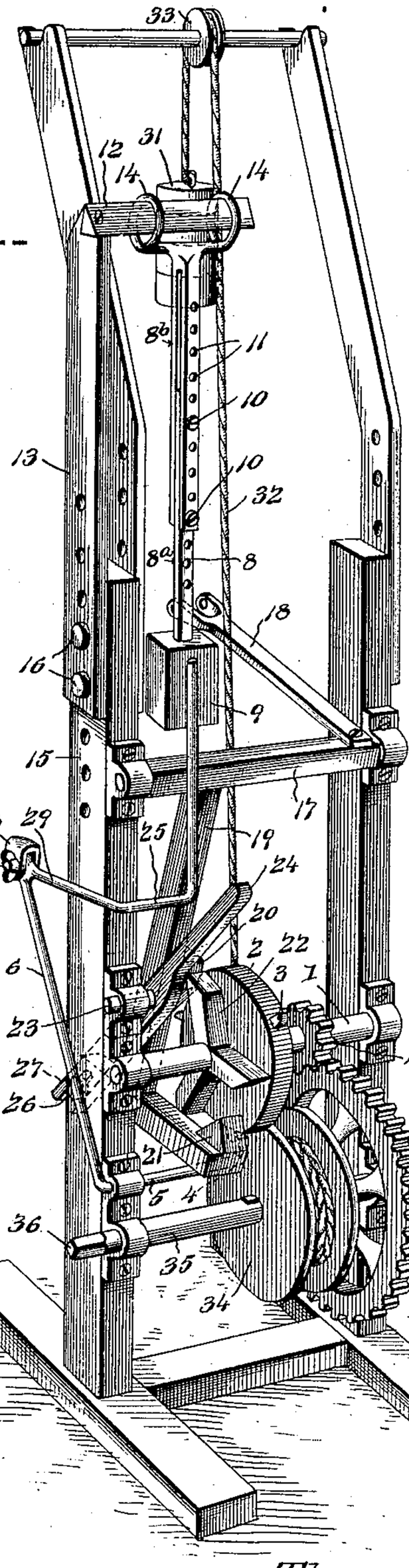
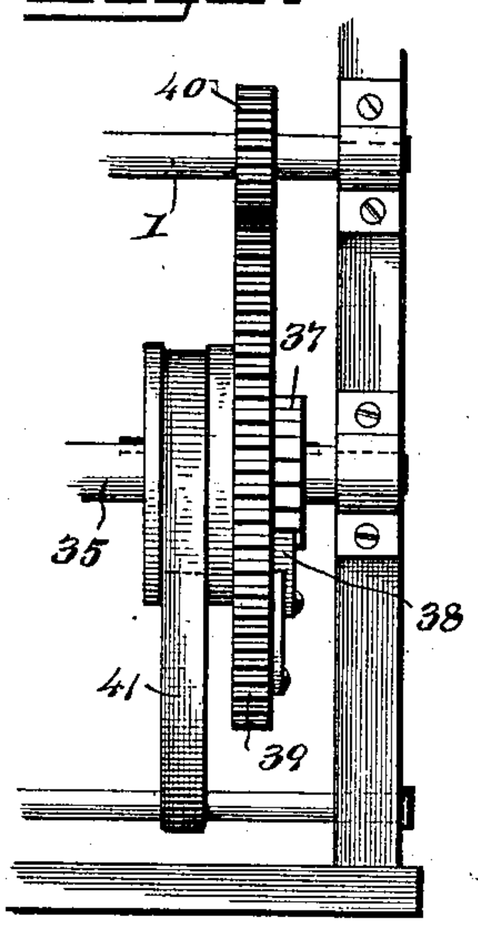


Fig. 2.



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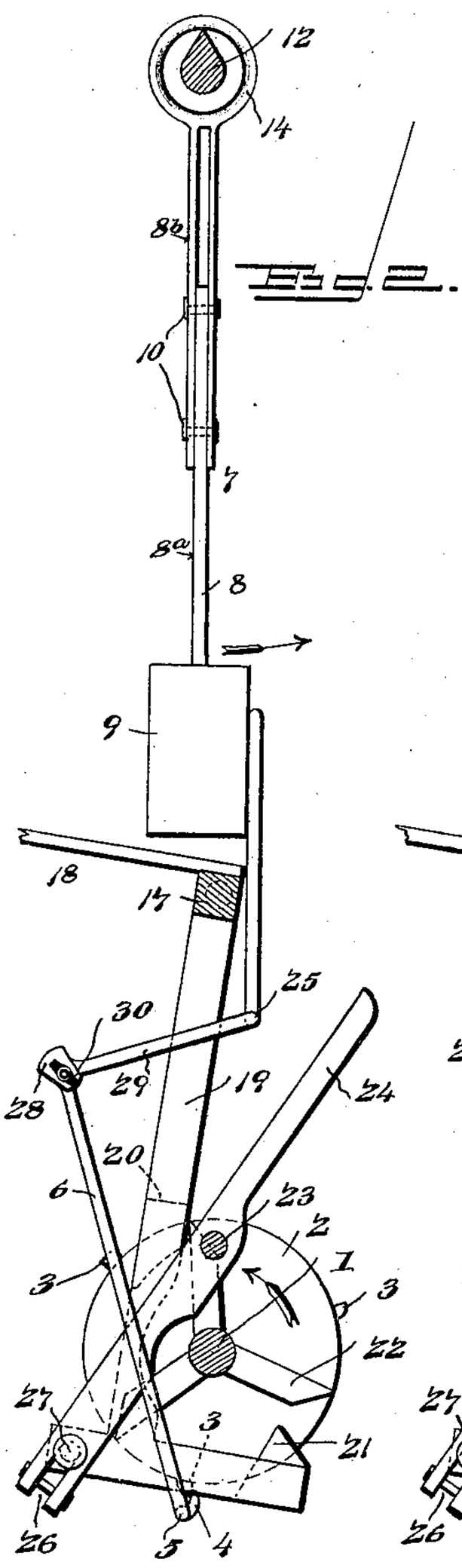

Fig. 2.

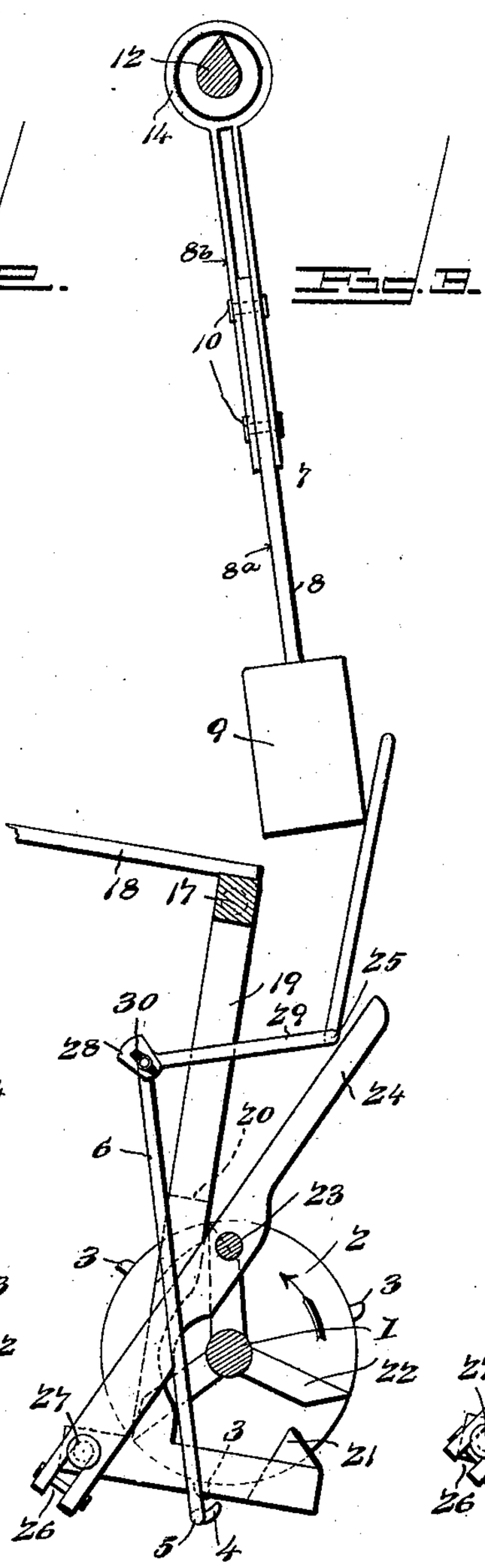

Fig. 3.

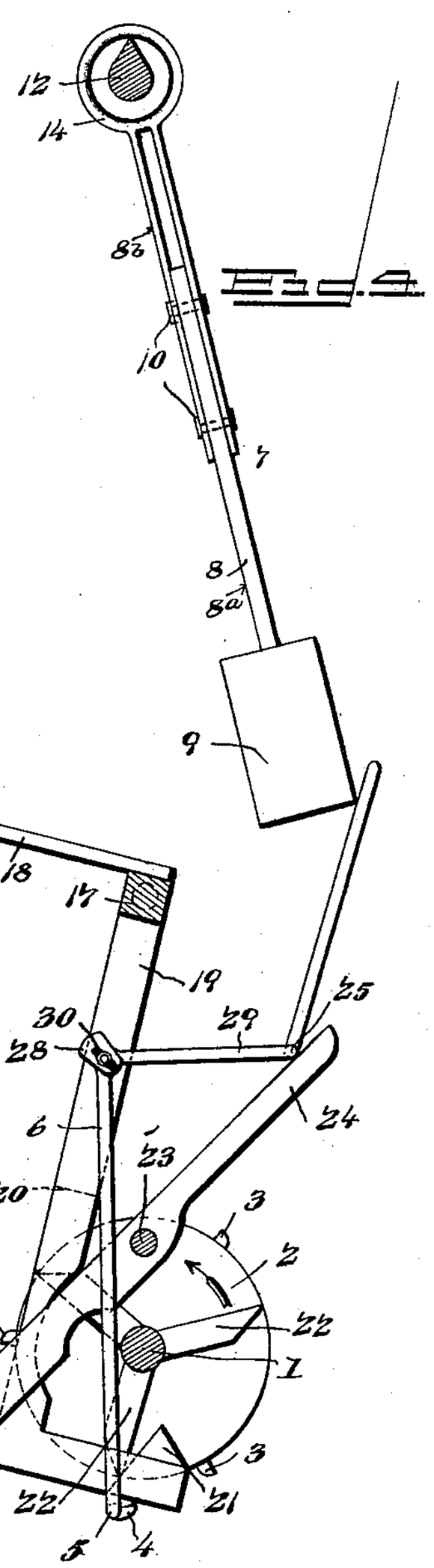

Fig. 4.

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UNITED STATES PATENT OFFICE.

THOMAS DOUGLASS, OF SARVERSVILLE, PENNSYLVANIA.

MOTOR.

SPECIFICATION forming part of Letters Patent No. 616,090, dated December 20, 1898.

Application filed February 21, 1898. Serial No. 671,145. (No model.)

To all whom it may concern:

Be it known that I, THOMAS DOUGLASS, a citizen of the United States, residing at Sarversville, in the county of Butler and State of Pennsylvania, have invented a new and useful Mechanical Movement, of which the following is a specification.

My invention relates to mechanical movements, and particularly to motors whereby reciprocatory motion may be imparted to a churn-dasher or equivalent device; and the object in view is to provide a simple, compact, and efficient construction of combined escapement and controlling or governing mechanism whereby the energy of a continuously-operating power, such as that supplied by a weight or spring, may be controlled and converted into a reciprocatory motion.

Further objects and advantages of this invention will appear in the following description, and the novel features thereof will be particularly pointed out in the appended claims.

In the drawings, Figure 1 is a perspective view of a motor constructed in accordance with my invention. Figs. 2, 3, and 4 are diagrammatic views of the parts of the mechanical movement in different relative positions. Fig. 5 is a view showing the application of a spring as a driving power.

Similar numerals of reference indicate corresponding parts in all the figures of the drawings.

1 designates a revoluble power-shaft adapted to be actuated by a continuously-exerted power—such as that supplied by a weight, spring, or the equivalent thereof—and carried thereby is a clutch-disk 2, provided with radial peripheral stop-pins 3, for engagement with a movable stop 4, arranged in the plane of the stop-pins and carried by a rock-shaft 5. Connected with the rock-shaft is a trip-arm 6, terminally disposed in the path of a trip-pendulum 7, consisting of a shank 8, a bob 9, adjustable by means of the shank 8, through the bolts 10, adapted to engage registering perforations 11 in the shank-sections 8^a 8^b, and the latter being fulcrumed by means of a knife-edge bearing 12 or its equivalent upon a standard 13, said pendulum-shank having bearing-eyes 14 or their equivalents to bear upon the knife-edge. The standard 13 is also adjustably mounted upon the contiguous upright 15 of the supporting-frame by means of bolts 16, engaging the desired openings in the standard, the latter being provided with a plurality of such openings to facilitate adjustment, whereby with different adjustments of the pendulum-shank members the standard may be varied in position to dispose the bob in operative relation to the extremity of the trip-arm.

17 represents a driven rock-shaft which may carry a dasher-arm 18 of suitable construction for attachment to a dasher-staff of a churn (not shown) or any equivalent device to be reciprocated. This rock-shaft carries an oscillatory arm 19, provided with tappets 20 and 21, arranged in the paths of tappet-arms 22 on the clutch-disk 2 or otherwise mounted for rotary movement with the driving-shaft 1, and mounted for swinging movement parallel with said oscillatory arm and having an intermediate fulcrum 23 is a return-lever 24, having one arm connected with the oscillatory arm for swinging movement therewith and having its other arm disposed to engage an offset 25 of the trip-arm. The connection between the lower arm of the return-lever and the oscillatory arm 19 consists in the construction illustrated of a slot 26 in the former engaging a pin 27 on the latter. Furthermore, the trip-arm is provided with an adjustable counterbalancing-weight 28, arranged upon an offset 29, which is located in the plane of swinging movement of the trip and adapted to be secured at the desired adjustment by means of a set-screw 30. The function of this counterbalancing-weight is to vary the resistance offered by the trip-arm to actuation by the pendulum and cause the trip-arm to maintain its normal position (with the stop 4 in the path of the stop-pins 3) until positively actuated by the pendulum and moved to the opposite limit of its path.

With the parts in the position illustrated in Fig. 2, the pendulum having been swung to the limit of its movement from the trip-arm, the return movement of the pendulum will bring its bob in contact with the trip-arm, and by swinging the latter with it in the direction indicated by the contiguous arrow in Fig. 2 the stop 4 will be depressed out of the path of the engaged stop-pin 3, as shown in

Fig. 3, and will thus release the clutch-disk and the operating-shaft for movement in the direction indicated by the arrow. As the disk turns one of the tappet-arms will engage the contiguous tappet 20, and thus throw the oscillatory arm 19 to the limit of its movement in one direction, (thus elevating the free end of the arm 18, as shown in Fig. 4,) and subsequently the preceding tappet-arm will engage the tappet 21 and swing the arm 19 in the opposite direction, thus depressing the free end of the arm 18. This return movement of the oscillatory arm 19 causes a corresponding movement of the connected arm of the return-lever 24, and thus, through the upper arm of the return-lever, causes the return movement of the trip-arm to the initial position indicated in Fig. 2.

In Fig. 1 I have shown the apparatus constructed for operation by means of a weight 31, of which the cord 32, after passing over a suitable guide-roll 33, is reeled upon a drum 34 on a winding-shaft 35, having a key-seat 36 and a ratchet mechanism of suitable construction whereby the weight-cord may be wound upon the drum without affecting the connection between the arbor 35 and the operating or driving shaft 1, said connection consisting of a gear 39 on the arbor meshing with a pinion 40 on the shaft 1. In Fig. 5, however, I have shown the apparatus constructed for operation by a spring 41, which is attached to an arbor 35, having connections constructed substantially as above indicated for communicating motion to the shaft 1. In said Fig. 5 I have illustrated a ratchet mechanism, consisting of a ratchet-gear 37 and a pawl 38, suitable for allowing the rotation of the shaft 35 to wind the spring without affecting the gear 39, and it is obvious that a similar or any equivalent ratchet mechanism may be used in connection with the apparatus when a weight-cord is employed

Various changes in the form, proportion, and the minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of this invention.

Having described my invention, what I claim is—

1. In a mechanical movement, the combination of a rotary member, and means for communicating continuous motion thereto in a uniform direction, stop mechanism including a movable stop arranged in the path of spaced stop-pins carried by the rotary member and a trip operatively connected with the stop, a pendulum for actuating the trip, and tappet mechanism including a return-arm for moving the trip in the opposite direction to that in which it is moved by the pendulum, substantially as specified.

2. In a mechanical movement, the combination of a rotary member, and means for imparting continuous motion thereto in a uniform direction, stop mechanism including a movable stop arranged in the path of spaced stop-pins carried by the rotary member, and having a trip-arm, a pendulum in the path of which said trip-arm is located, and tappet mechanism actuated by said rotary member, and having connection with said trip-arm for returning the latter after each actuation by the pendulum, to impart swinging motion to the latter, substantially as specified.

3. In a mechanical movement, the combination of a rotary member, and means for imparting continuous motion thereto in a uniform direction, and stop mechanism including a movable stop, and spaced stop-pins carried by the rotary member, said movable stop having a connected trip-arm mounted for swinging movement, a pendulum in the path of which said trip-arm is arranged, a swinging member carrying tappets, a tappet-arm carried by said rotary member for contact with the tappets, and means for communicating return movement from said swinging member to the trip-arm, substantially as specified.

4. In a mechanical movement, the combination of a rotary member, and means for communicating continuous motion in a uniform direction thereto, and stop mechanism including a movable stop arranged in the path of spaced stop-pins carried by the rotary member, said stop having a trip-arm mounted for swinging movement, a pendulum in the path of which said trip-arm is arranged, an oscillatory arm having tappets, tappet-arms carried by the rotary member for successive contact with the tappets to impart swinging movement in opposite directions to the oscillatory arm, and a return-lever operatively connected with the oscillatory arm, for engagement with the trip-arm to return the latter after each actuation by the pendulum, substantially as specified.

5. In a mechanical movement, the combination of a shaft, and means for imparting continuous motion in a uniform direction thereto, a disk carried by said shaft and provided with spaced stop-pins, a rocking stop normally located in the path of said stop-pins for checking the movement of the shaft, a trip-arm connected with said stop, a pendulum in the path of which said trip-arm is arranged, a rock-shaft, an oscillatory arm carried by the rock-shaft and provided with spaced tappets, tappet-arms carried by the rock-shaft for successive contact with said tappets to impart swinging movement in opposite directions to the oscillatory arm, and a return-lever having one arm connected with said oscillatory arm, and having its other arm arranged in operative relation with an offset of the trip-arm, for returning the latter and imparting motion to the pendulum, substantially as specified.

6. In a mechanical movement, the combination of a rotary member, and means for imparting continuous motion in a uniform direction thereto, stop mechanism including a movable stop arranged in the path of stop-

pins carried by the rotary member, a swinging trip-arm connected with said movable stop, a counterbalancing-weight adjustably mounted upon the trip-arm for independent movement in a direction parallel with the plane of oscillation of the trip-arm, a pendulum in the path of which said trip-arm is arranged, an oscillatory arm having tappets for successive engagement by the tappet-arms carried by the rotary member, and a return-lever operatively connected with the oscillatory arm, and having an arm in the path of which said trip-arm is disposed, substantially as specified.

7. In a mechanical movement, the combination of a rotary member, and means for imparting continuous motion in a uniform direction thereto, stop mechanism including a movable stop arranged in the path of stop-pins carried by the rotary member, a swinging trip-arm connected with said movable stop, a counterbalancing-weight adjustably mounted upon the trip-arm for independent movement in a direction parallel with the plane of oscillation of the trip-arm, a pendulum in the path of which said trip-arm is arranged, means for varying the rapidity of vibration of the pendulum, an oscillatory arm having tappets for successive engagement by the tappet-arms carried by the rotary member, and a return-lever operatively connected with the oscillatory arm, and having an arm in the path of which said trip-arm is disposed, substantially as specified.

8. In a mechanical movement, the combination of a rotary member, and means for imparting continuous motion in a uniform direction thereto, stop mechanism including a movable stop arranged in the path of stop-pins carried by the rotary member, a swinging trip-arm connected with said movable stop, a counterbalancing-weight adjustably mounted upon the trip-arm for independent movement in a direction parallel with the plane of oscillation of the trip-arm, a pendulum in the path of which said trip-arm is arranged, said pendulum having a shank, a bob mounted for adjustment upon the shank, and means for securing the bob at the desired adjustment, an adjustable bearing for the pendulum-shank, an oscillatory arm having tappets for successive engagement by the tappet-arms carried by the rotary member, and a return-lever operatively connected with the oscillatory arm, and having an arm in the path of which said trip-arm is disposed, substantially as specified.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

THOS. DOUGLASS.

Witnesses:
JOHN H. SIGGERS,
HAROLD H. SIMMS.