

No. 773,515.

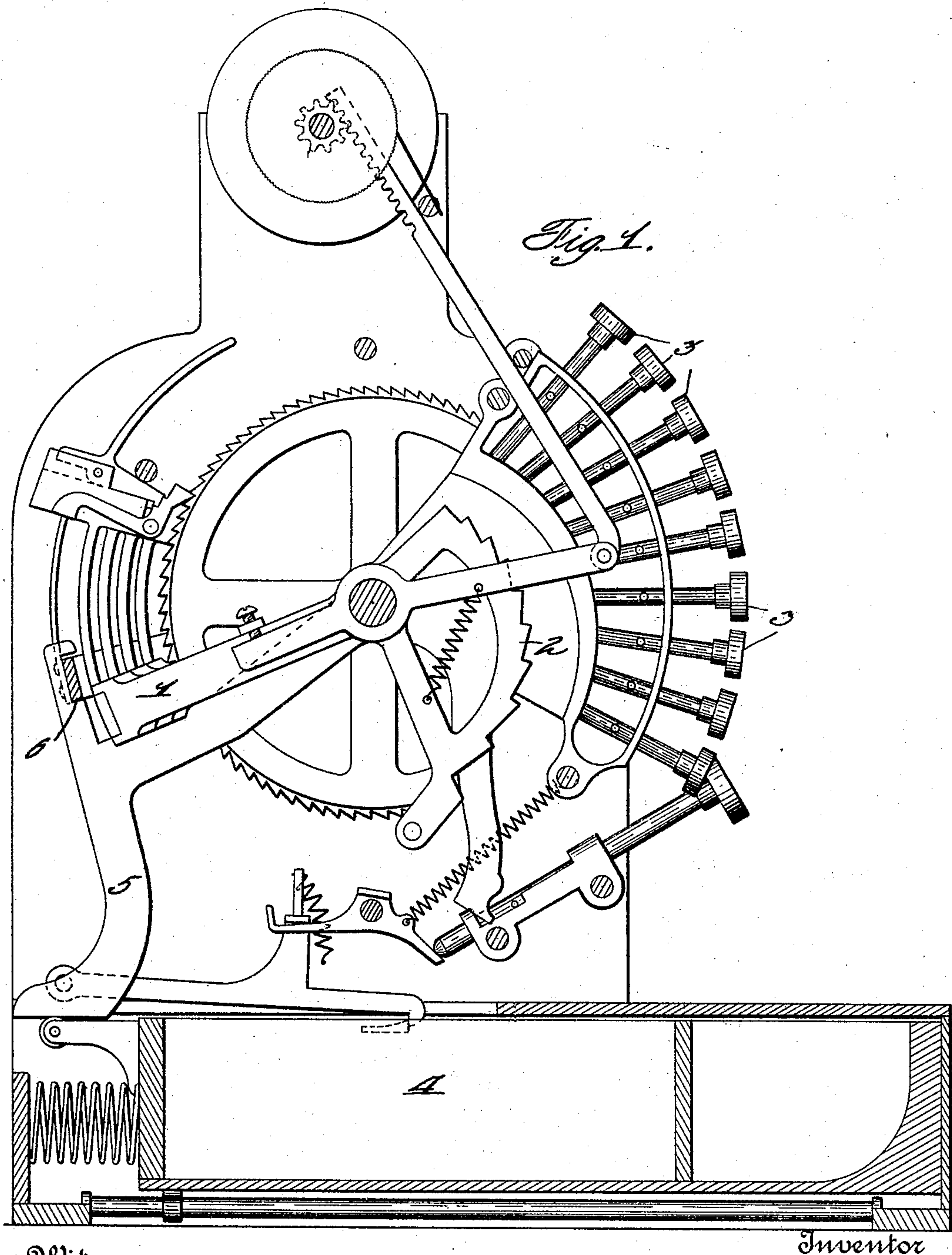
PATENTED OCT. 25, 1904.

W. H. MUZZY.
CASH REGISTER.

NO MODEL.

APPLICATION FILED JULY 29, 1904.

4 SHEETS—SHEET 1.



Witnesses
W. M. McCarthy
Mildred Monfort

Inventor
W. H. Muzzy

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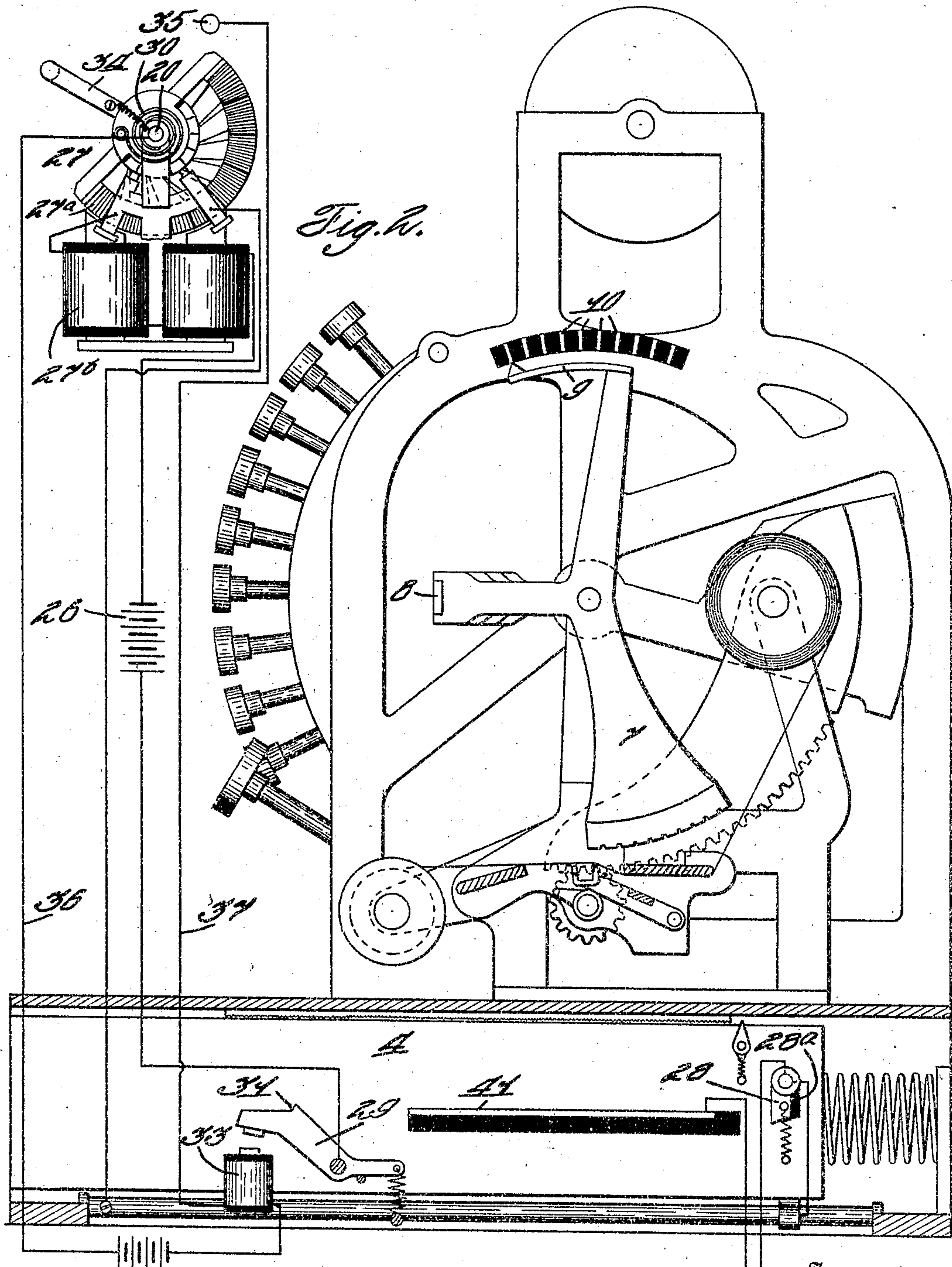
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4 SHEETS—SHEET 3.

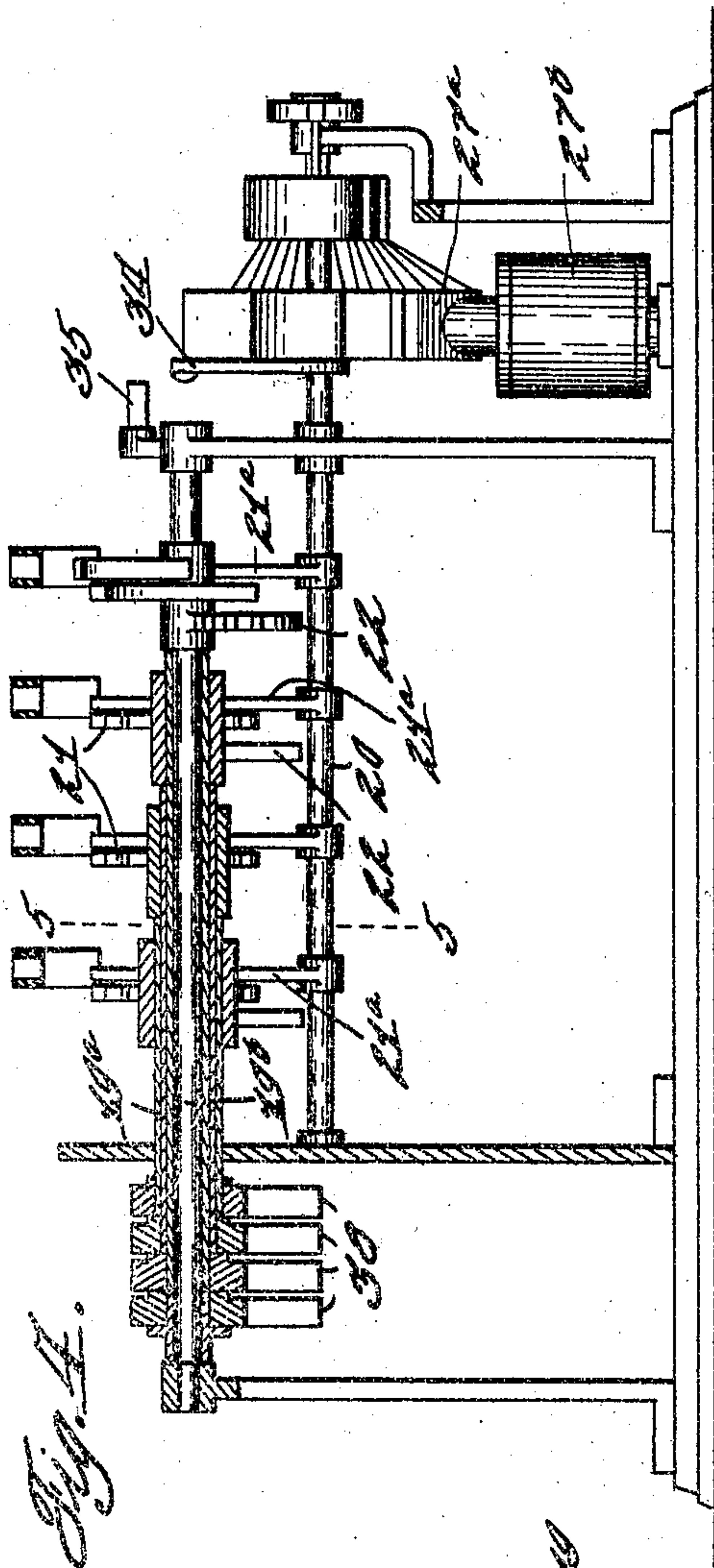


Fig. 4.

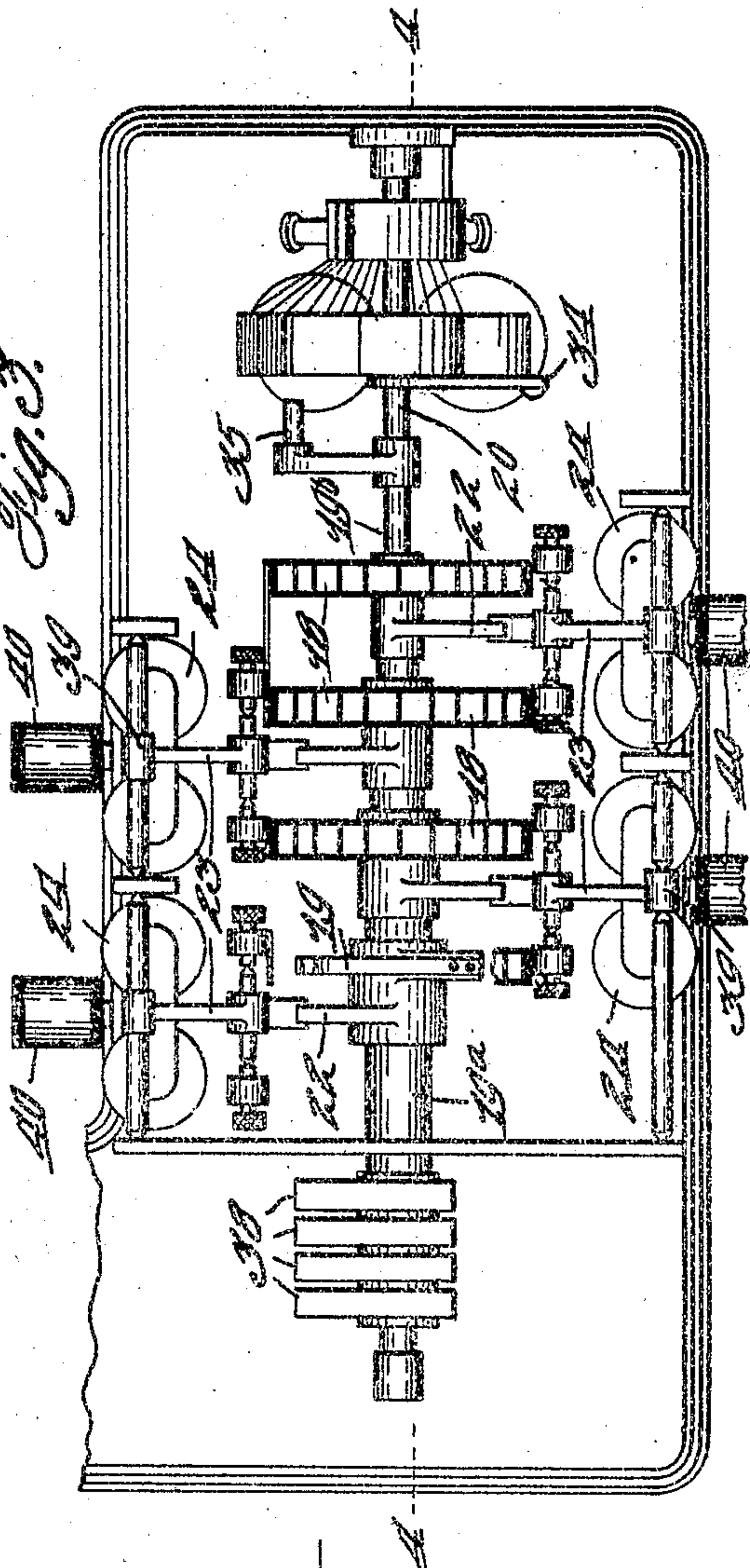
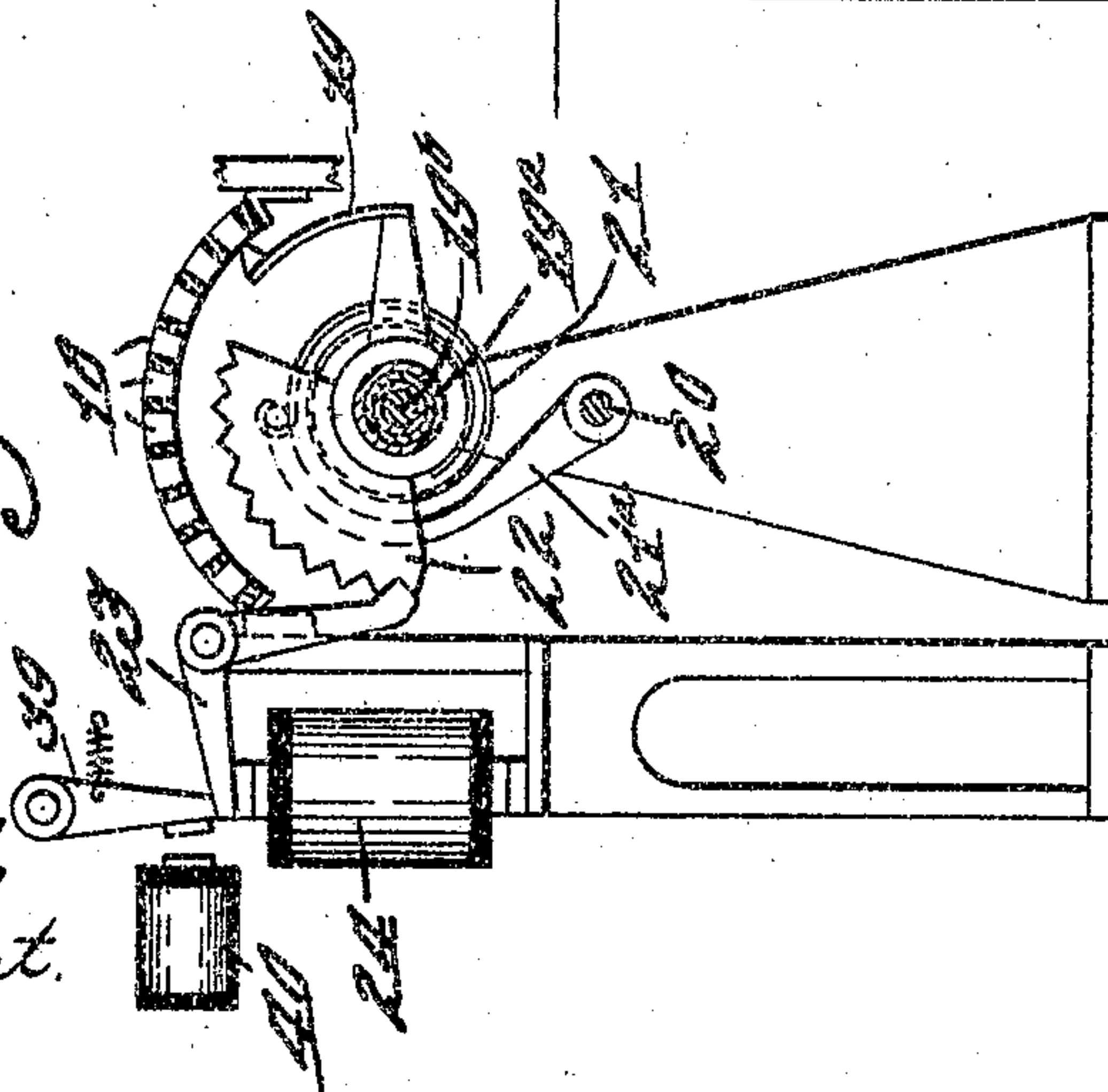


Fig. 5.



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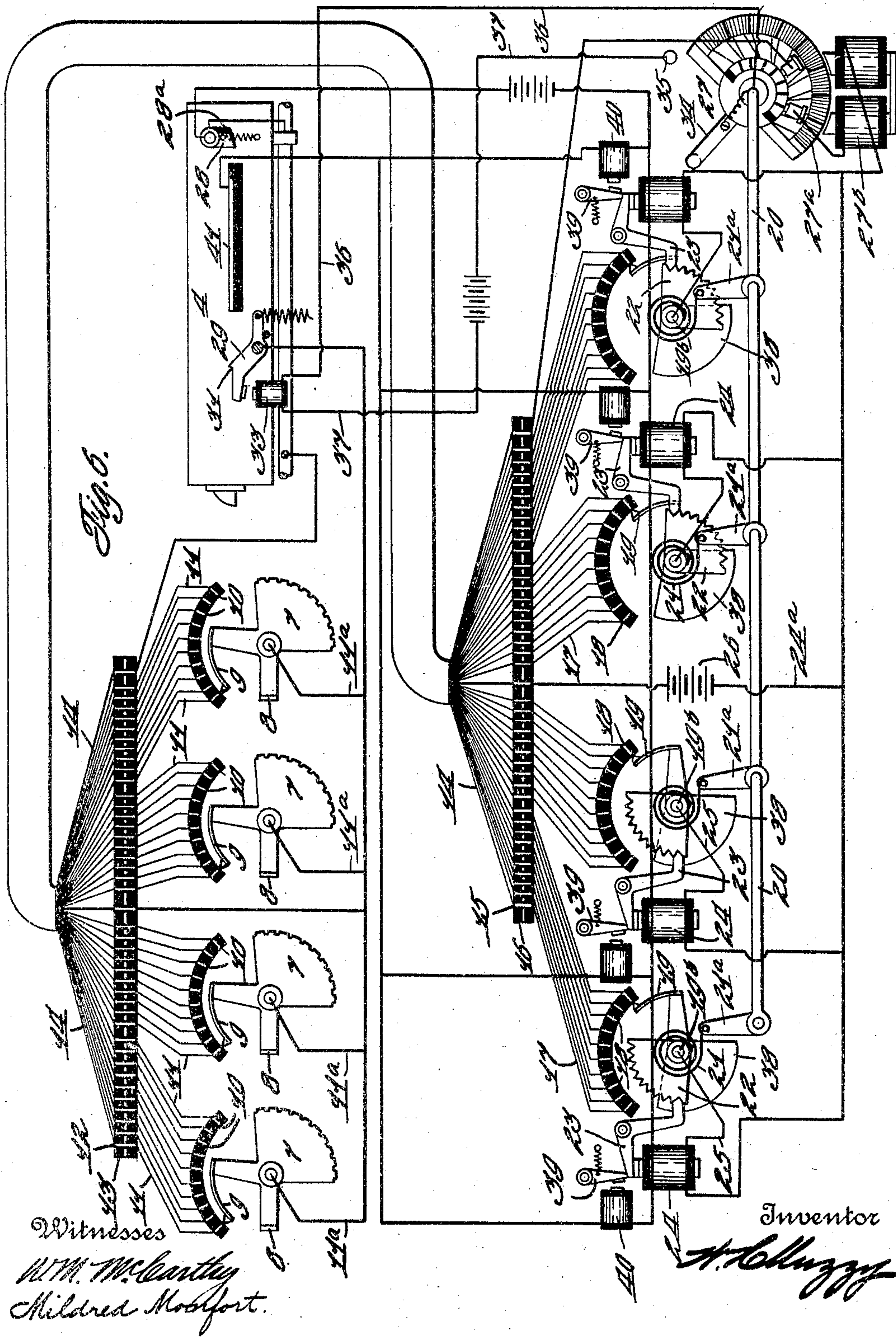
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4 SHEETS—SHEET 4.



UNITED STATES PATENT OFFICE.

WILLIAM H. MUZZY, OF DAYTON, OHIO, ASSIGNOR TO NATIONAL CASH REGISTER COMPANY, OF JERSEY CITY, NEW JERSEY, A CORPORATION OF NEW JERSEY.

CASH-REGISTER.

SPECIFICATION forming part of Letters Patent No. 773,515, dated October 25, 1904.

Application filed July 29, 1904. Serial No. 218,630. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. MUZZY, a citizen of the United States, residing at Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Cash-Registers, of which I declare the following to be a full, clear, and exact description.

This invention relates to improvements in cash-registers, and has more particular relation to improvements in indicating devices for registers for making an indication at a distance correspond to the indication at the machine.

One of the principal objects of my invention is to provide means whereby the proper sequence of operation of the different parts is assured no matter what the degree of rapidity with which the machine is operated.

Another object is to provide improved means whereby the distant indication will remain in view until the next succeeding operation of the machine.

With these and incidental objects in view the invention consists in certain novel features of construction and combinations of parts, the essential elements of which are set forth in appended claims and a preferred form of embodiment of which is hereinafter specifically described with reference to the drawings which accompany and form part of this specification.

In the accompanying drawings, forming part of this specification, Figure 1 represents a transverse section of the machine of the class to which I have applied my improvements. Fig. 2 is an end elevation showing the contact arms and plates controlled by the differentially-movable registering elements. Fig. 3 is a top plan view of the distant indicating mechanism and its connections. Fig. 4 is a longitudinal section taken on the line 4 4 of Fig. 3, the motor being shown in full lines. Fig. 5 is a transverse section taken on the line 5 5 of Fig. 4. Fig. 6 is a diagrammatic view of the electrical connections.

I have shown my present improvements as applied to the type of machine patented in Great Britain to Henry S. Hallwood, No. 4,543 of 1903, except that the machine is operated

by the cash-drawer instead of by an operating-handle. As a number of the parts shown and described in the present drawings are fully shown and described in this patent to Hallwood, I will refer to the same for such detail description of the parts as is not hereinafter given.

Described in general terms, however, the type of machine to which I have applied my invention may be said to comprise a plurality of pivoted register-operating yokes 1, each of which is controlled by a stepped segment 2, these segments being limited in their movements by stop-keys 3. After the yokes have been allowed to descend and are arrested by the keys they are returned to their normal positions to effect the registration by means of a sliding cash-drawer 4, which contacts with an arm 5, secured to a main yoke 6, which latter returns all of the first-mentioned or auxiliary yokes to their normal positions. The printing-segments 7 of the cash-register are connected by arms 8 to the movable yokes, so as to take up positions corresponding to the movements of the yokes. Each of these auxiliary yokes also carries a commutator or contact-arm 9, which is arranged to play over a series of ten contact-plates 10, which are suitably mounted and insulated from each other. Each of the plates 10 is connected in an independent circuit by one of a series of wires 11, Fig. 6. It will be seen from the above that should the cash-register be operated so that one of the auxiliary yokes will drop to the regular five-cent position the arm 9 will come to rest upon the contact-plate representing "5." This will close the circuit at the "5" point through the wire 11.

Each of the wires 11 is connected to a plug 12 in a connecting-board 13. All of the plugs 12 are connected by wires 14 passing through a cable to similar plugs 15 in a similar connecting-board 16, located at a distance from the first-mentioned board. All of the plugs 15 are connected by wires 17 to a series of contact-plates 18 corresponding to the contact-plates 10. Contact-arms 19, mounted on nested sleeves 19^a and a rock-shaft 19^b, are arranged to pass over the contact-plates 18

when said sleeves or shaft are oscillated. Springs 21 connect arms 21^a to the sleeves and shaft for imparting movement to the same when said arms are rocked by a shaft 20, upon which they are mounted. Each of the sleeves and shaft is provided with a toothed segment 22, which is arranged to be engaged by a bell-crank locking-lever 23, which is actuated by an electromagnet 24. The circuit for the magnet 24 is by way of wire 25 to its particular arm 19, through contact-plate 18, wire 17, plug 15, wire 14, plate 12, wire 11, plate 10, arm 9, and wire 11^a to battery 26 and back to magnet 24 by wire 24^a.

It will be seen from the above that after an arm 9 has taken up a position in connection with the plate 10 representing the numeral "5" should the arm 19 be brought into contact with the corresponding plate 18 representing the numeral "5" the circuit will be closed and the magnet 24 energized to cause the bell-crank lever to lock the segment 22. The oscillation of the actuating-shaft 20 must thus occur at a period subsequent to the greatest movement that can be made by the arms 9. In other words, the shaft 20 must not commence its operation until after that period in the operation of the machine when the arms 9 may have moved to the positions representing the numerals "9." To accomplish this result, the motor 27 for operating the shaft 20 is controlled from the cash-drawer 4. The motor 27 is of any suitable oscillatory type and comprises an oscillatory armature 27^a and stationary magnets 27^b. The circuit for the motor passes through the battery 26 or other source of electric energy, and one of the wires of this circuit is connected to a pivoted contact-maker 28, mounted upon the side of the cash-drawer 4. The other wire of the circuit is connected to a pivoted contact and latching arm 29, mounted upon the frame beside the cash-drawer, so that after the cash-drawer has been almost completely opened the contact-piece 28 will engage the plate 29 and close the motor-circuit to actuate the shaft 20. A suitable spring 30 connects shaft 20 to the motor-frame for returning the shaft when the motor is deenergized. The contact-piece 28 is also utilized to lock the cash-drawer in its opened position by engaging in a notch 31, formed in the arm 29. This arm 29 is of soft iron and at the proper period is attracted by an electromagnet 33 to draw the arm 29 downward, and thus release the contact-piece 28 and permit the cash-drawer to be closed. The circuit through the magnet 33 is controlled by the motor 27 by means of a contact-arm 34, mounted on the shaft 20 and arranged to contact with a contact-plate 35 as the motor completes its stroke in one direction. One of the wires 36 from the magnet 33 is connected to the shaft 20, while the remaining wire 37 is connected to the contact-plate 35, a suitable battery be-

ing introduced into the circuit to provide suitable energy to operate the magnet 33.

The contact-arms 9 normally rest upon contact-plates 10 which represent the zeros, whereby if a contact-arm for a certain bank is not operated it will remain on this zero-contact. The contact-arms 19, however, normally rest upon the contact-plates representing "9" and travel successively over the contact-plates toward the zero-plates, which are located at the extreme end of their travel. The indicating-segments 38 are thus brought to positions to indicate zero in such banks in which no keys are operated.

It will be seen from the above description that after the cash-drawer has been opened and the main circuit of the motor established the cash-drawer cannot be closed again until the motor has made its complete operation. By this means a full stroke of the motor is assured, and any possibility of the circuit being broken before the arms 19 have made a complete stroke is avoided. If it were not for this preventing means, the cash-drawer when rapidly operated would break the circuit of the motor before the arms 19 had made a complete stroke, with the result that no indication or a wrong indication would be made. Each of the nested sleeves 19^a and shaft 19^b carries a segmental indicator 38 fast thereto, so that when any one of said sleeves or shaft is operated and arrested the corresponding numeral upon the indicator will be disclosed through an opening in the front of the casing and will remain so exposed until the subsequent operation of the machine even though the cash-drawer be closed and the contact-arms 9 returned to their normal positions. To effect this result, I provide a series of spring-drawn locking-pawls 39, which normally engage the ends of the bell-crank locking-levers 23. When any one of the magnets 24 is energized, however, and the lever 23 operated, the pawl 39 will pass over the lever 23 and lock it in its locking position.

The pawl 39 is formed of soft iron and is arranged to be operated by an electromagnet 40, which is connected in a circuit with the contact 28 and a stationary contact-plate 41. The position of the contact-plate 41 is such that the contact-pawl 28 will engage the same with one of its sides when the cash-drawer is being opened and with its opposite side when the cash-drawer is being closed. This opposite side of the contact 28 is provided with an insulating-plate 28^a. By this means after one of the pawls 39 has passed over and locked its lever 23 it remains in its locking position when the cash-drawer is closed; but the initial opening movement of the cash-drawer will energize the magnet 40 and draw the pawl 39 from over the bell-crank 23, thus releasing the arms 19 and indicators 38 connected thereto. Coil-springs 21 then return these parts to their normal positions. In order to prevent

any possibility of the arms 19 contacting with intermediate plates which are contacting with the arms 9 upon the return movement of said arms 19, and thus locking the indicators in im-
 5 proper positions, the contact-plate 41 is extended, so that the magnet 40 will be energized during the entire return movement of the arms 19—that is, until the cash-drawer is almost completely opened. By this means
 10 should any of the indicators 38 be temporarily arrested upon its rearward movement it will be instantly released again and permitted to move to its zero position as the contact 9 passes free of the improper segment in its forward movement. When the pawl 28 reaches
 15 its position forward of the contact-plate 41, it will reverse, so that when the cash-drawer is closed the opposite insulated side of the pawl is bearing upon the strip 41.

20 It will be seen from the foregoing description that any misoperation of the machine because of rapidity of movement or a desire on the part of the clerk to manipulate it is absolutely prevented, and the parts must abso-
 25 lutely be operated in their proper sequence because of the interlocking devices. The presence of these interlocking devices is not apparent during the ordinary operation of the machine, and they do not in any wise interfere
 30 with the free movement of the parts. Without these devices, however, the machine is practically useless, as manipulation or even accidental misoperation of the parts might easily occur.

35 The motor 27 is of any desired type, and I have only shown the same in the shape of an oscillatory motor for convenience of illustration. It will be understood that any desired
 40 type of motor may be employed for imparting an oscillatory movement to the shaft 20. It will also be understood that the invention might well be applied to other types of machines than that shown, but is particularly ap-
 45 plicable to such machines as are provided with an operating element, such as a cash-drawer, which controls the movements of the several setting devices, so that this operating element might be controlled in its movement by de-
 50 vices which are in turn controlled by the movements of the electrical indicator-actuator located at a distance from the register. In other words, the register is locked in a partially-operated or initially-set condition until the distant source of energy has made a sufficient
 55 portion of its operation to warrant the proper indication and is then released, so that the remaining portion of its operation may be completed. This is especially desirable and im-
 60 perative where the completion of the operation of the register deenergizes the distant motor. It will also be understood that the invention is not limited to such contact-makers or commutators as the arms 9 or 19, but that the cash-register may close the individual cir-
 65 cuits in any desired manner—such, for in-

stance, as plain switches or contact devices operated directly by the several keys. The several circuits for the different magnets may also be supplied from a single source of electrical energy, and I have shown several bat-
 70 teries simply for the sake of simplicity in illustrating the wiring of the several circuits.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a cash-register, the combination with circuit-controllers, of an operating mechanism, a motor, indicators controlled by the motor, means for controlling the motor from the operating mechanism, and means for preventing the movement of the operating mechanism to deenergize the motor until after said motor has made its full movement.

2. In a cash-register, the combination with circuit-controllers, of an operating mechanism, a motor, means for energizing the motor by movement of the operating mechanism, and means for preventing the motor being deenergized by the operating mechanism until the motor has been fully operated.

3. In a cash-register, the combination with circuit-controllers, of an operating mechanism, a series of indicators also having controllers, a motor for operating the indicators, means controlled by the operating mechanism
 95 for energizing the motor, and means for preventing the motor being deenergized until it has been fully operated.

4. In a cash-register, the combination with circuit-controllers, of an operating mechanism, a motor, indicators operated by the motor, means controlling the motor from the operating mechanism, and means for preventing the operating mechanism deenergizing the motor until the latter has completed its full
 105 movement.

5. In a cash-register, the combination with circuit-controllers, of an operating mechanism, a motor, circuit-controllers movable by the motor and locking devices for the latter
 110 circuit-controllers for locking them in their set positions while the first-mentioned controllers return to their normal positions.

6. In a cash-register, the combination with differentially-movable circuit-controllers, of an operating mechanism, a motor, differentially-movable circuit-controllers actuated by the motor, indicators controlled by the last-mentioned circuit-controllers, and means for locking the last-mentioned circuit-controllers
 120 in their set positions while the first-mentioned controllers return to their normal positions.

7. In a cash-register, the combination with setting means, of an operating mechanism, a series of indicators located at a distance from
 125 the register, a motor for actuating the indicators, means controlled by the operating mechanism for energizing and deenergizing the motor, and means controlled by the motor for preventing movement of the operating
 130

means to deenergize the motor, until said motor has made its full stroke or operation.

8. In a cash-register, the combination with a series of differentially-movable circuit-controllers, of a cash-drawer for operating the same, a motor, a series of differentially-movable corresponding circuit-controllers actuated thereby, means controlled by the cash-drawer for energizing and deenergizing the motor, and means controlled by the motor for preventing movement of the cash-drawer to deenergize it until the motor has made a full operation.

9. In a cash-register, the combination with a series of oscillatory elements having differential movements, keys for limiting the movements of said elements in one direction, a cash-drawer for returning the elements in an opposite direction, circuit-controllers movable with said elements, a motor, indicators operated by said motor, means controlled by the cash-drawer for energizing and deenergizing the motor, and means controlled by the motor for preventing it being deenergized by the cash-drawer until said motor has been fully operated.

10. In a cash-register, the combination with

a series of oscillatory differentially-movable elements, circuit-controllers carried by said elements, a cash-drawer for operating said elements, a motor, indicators operated by the motor, means for energizing the motor upon the opening of the cash-drawer and deenergizing it when the cash-drawer is closed, and means for locking the cash-drawer in its open position until the motor has been fully operated.

11. In a cash-register, the combination with circuit-controllers, of an operating mechanism, a motor, indicators actuated by the motor, means for energizing the motor during the initial movement of the operating mechanism and deenergizing it during the final movement of said mechanism, and means for locking the operating mechanism between its initial and final movements until the motor has been completely operated.

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

WILLIAM H. MUZZY.

Witnesses:

W. M. MCCARTHY,
MILDRED MONFORT.