

W. H. MUZZY.

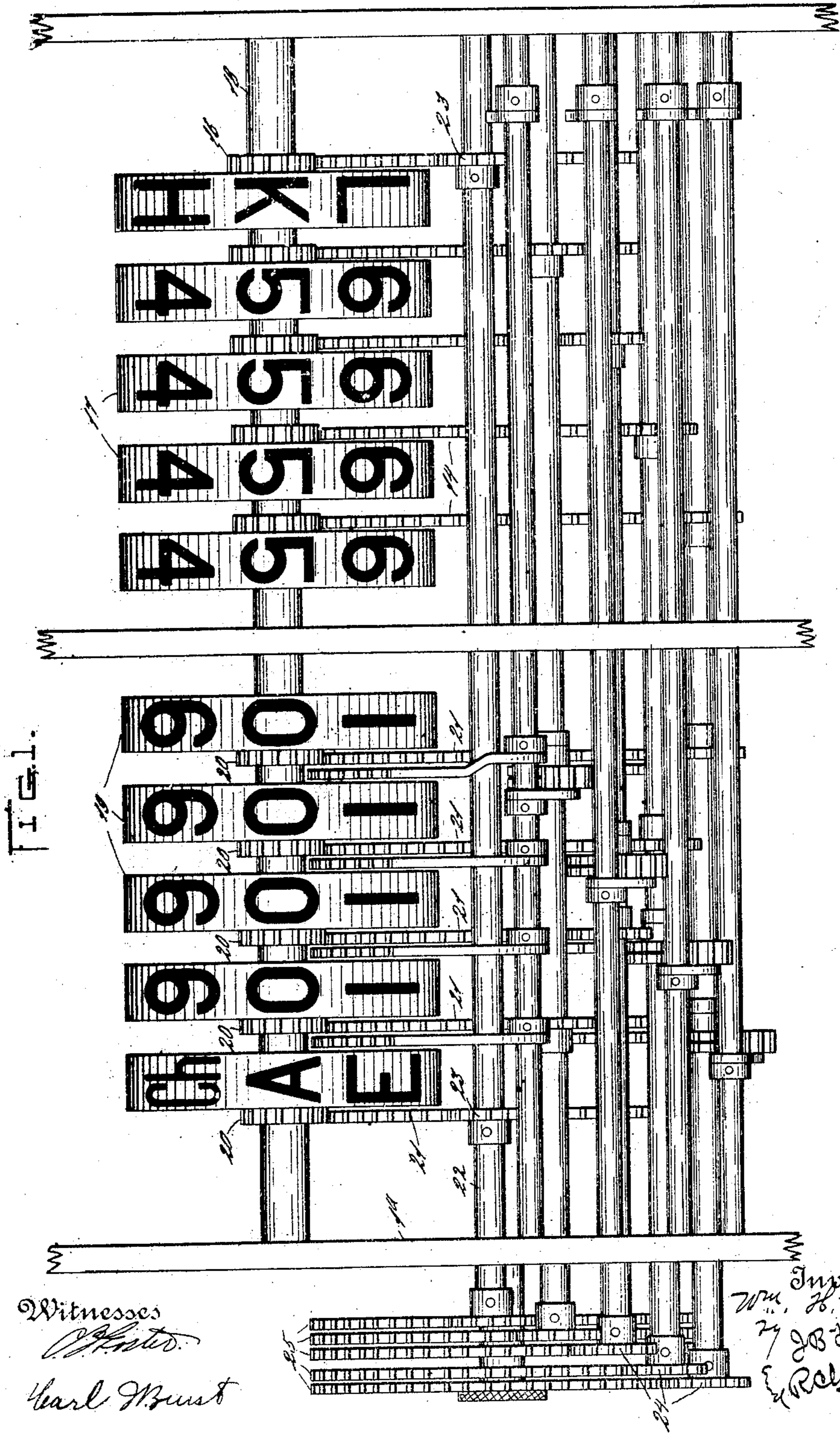
CASH REGISTER.

APPLICATION FILED OCT. 18, 1906.

Patented July 20, 1909.

5 SHEETS—SHEET 1.

928,267.



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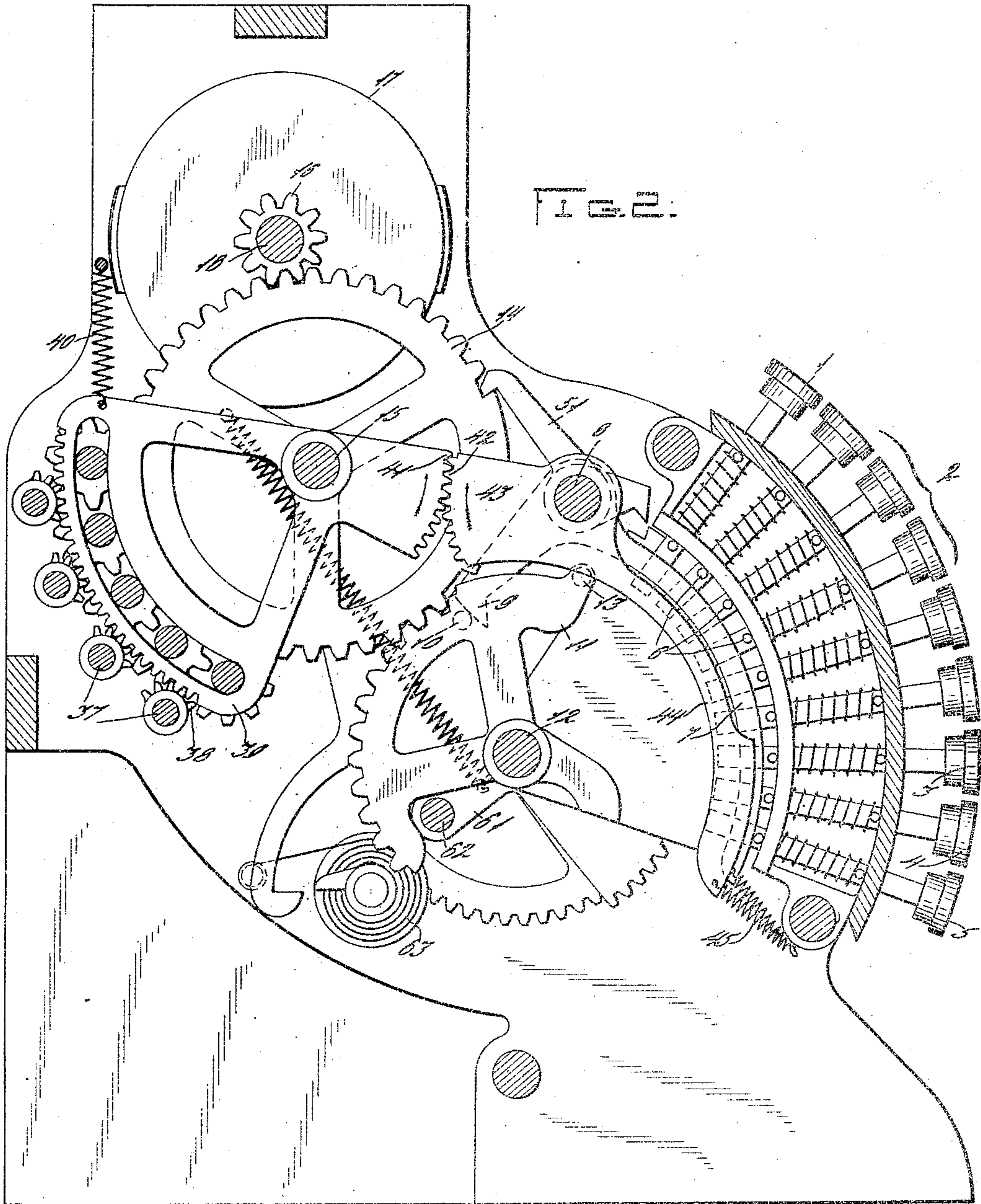
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5 SHEETS—SHEET 2.

928,267.



Witnesses

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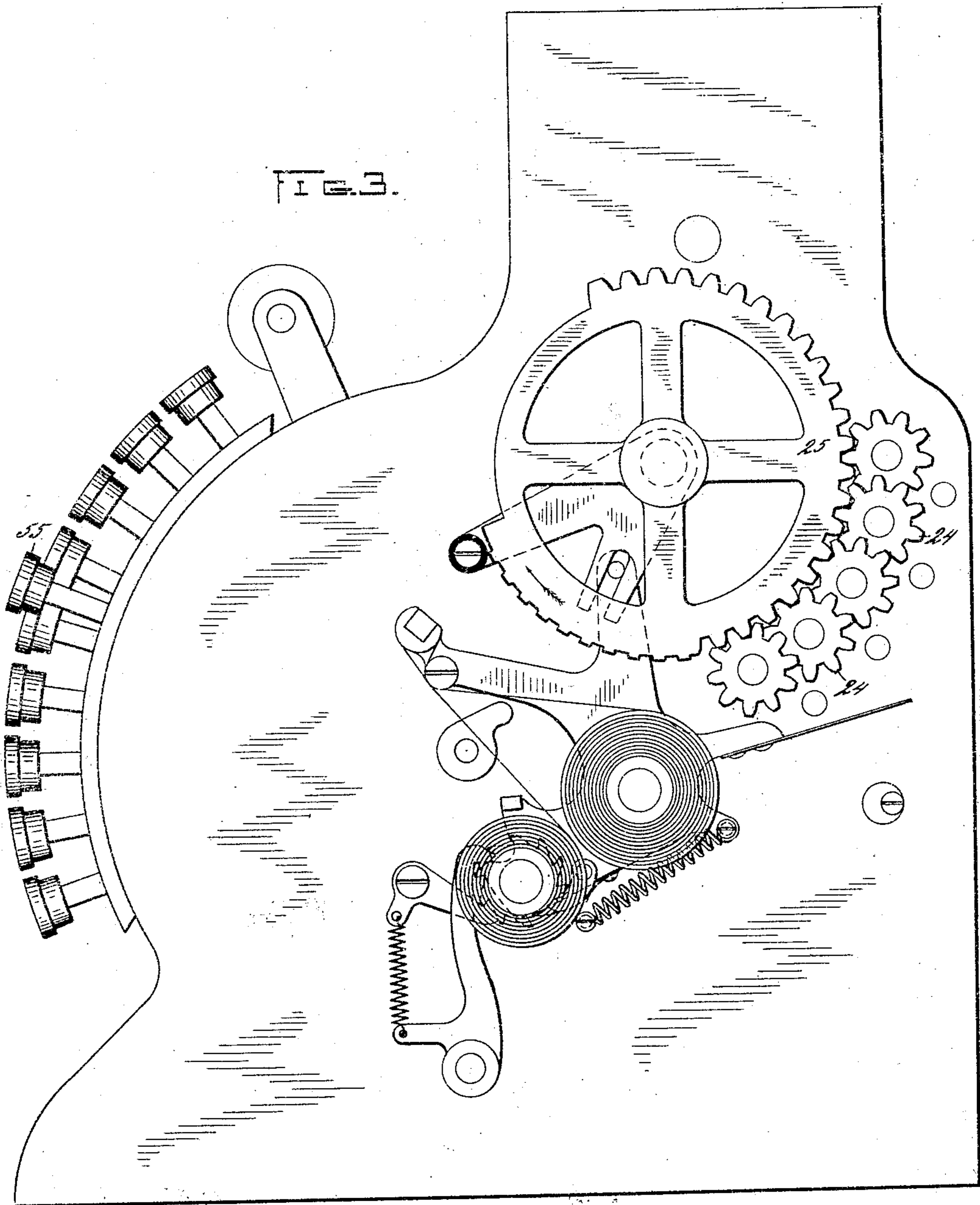
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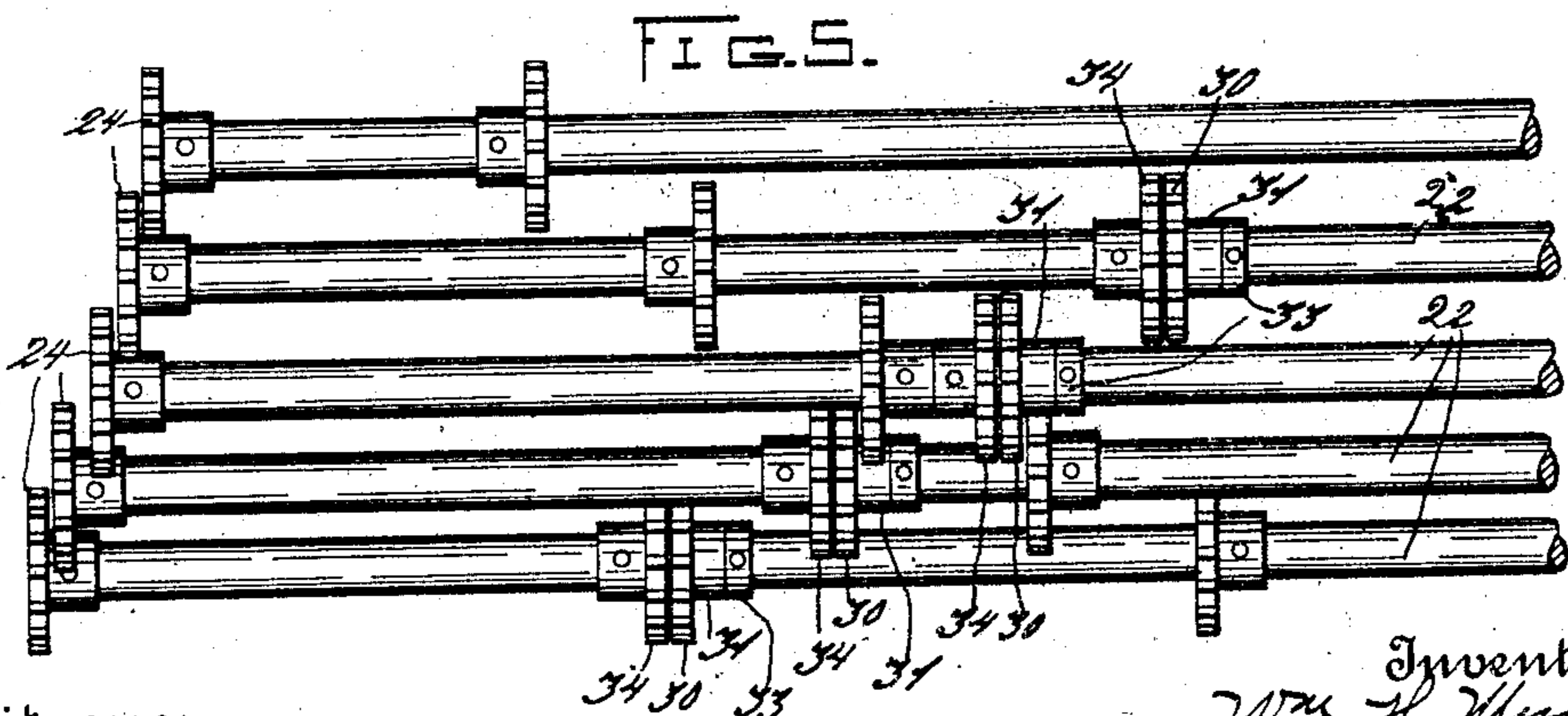
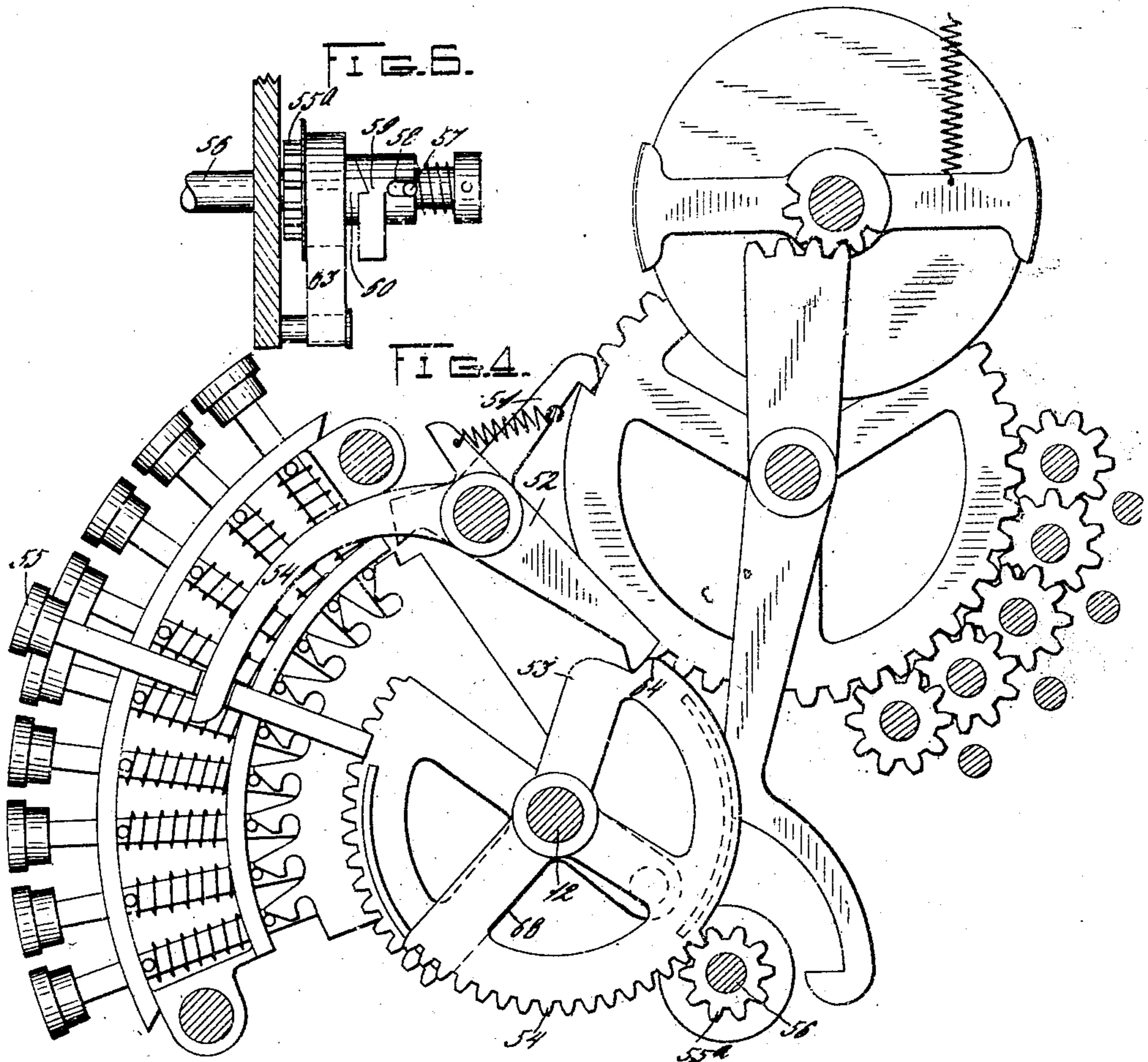
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5 SHEETS—SHEET 4.



Witnesses
Charles M. Burt
Carl M. Burt.

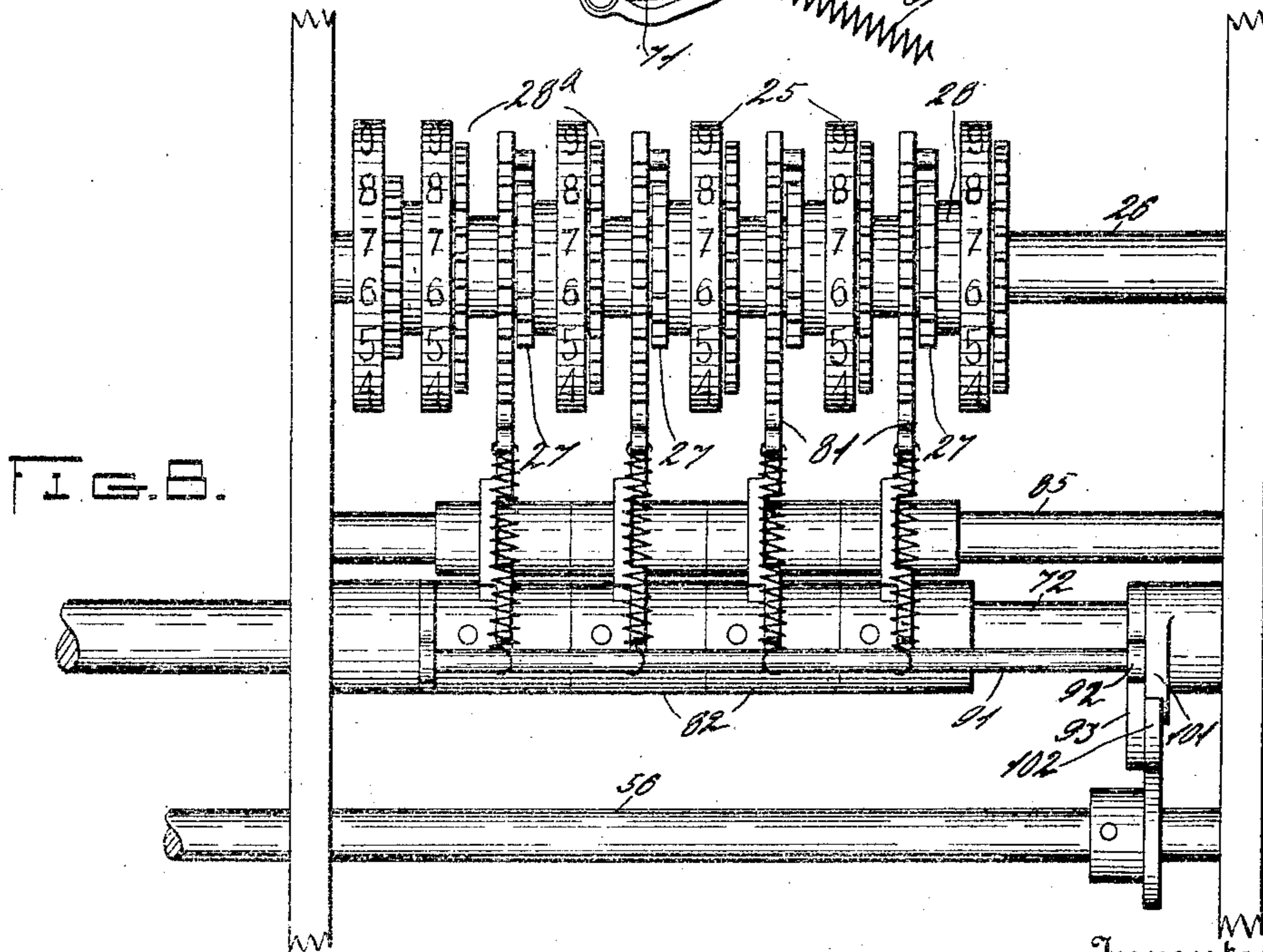
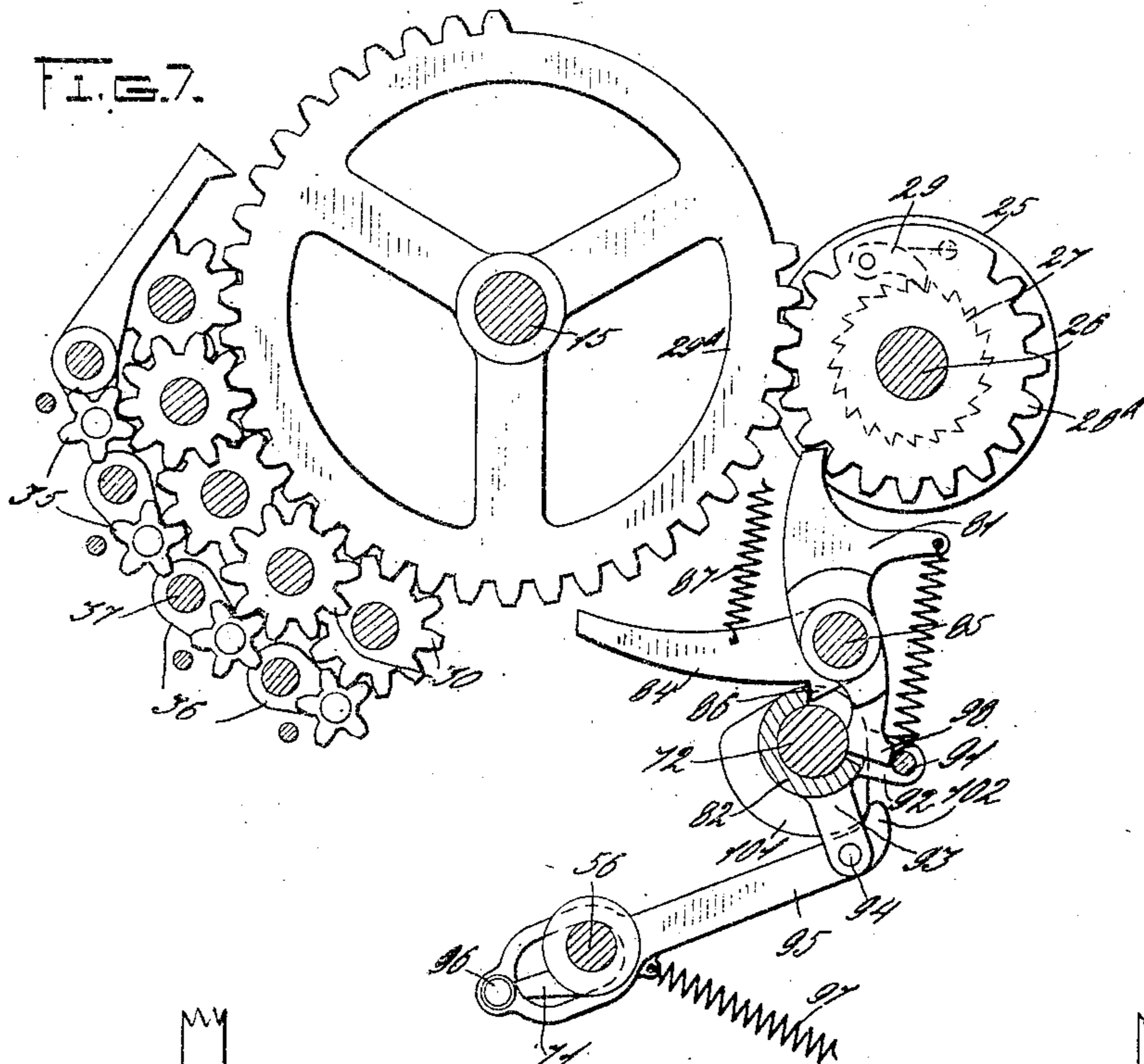
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6 SHEETS—SHEET 5



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UNITED STATES PATENT OFFICE.

WILLIAM H. MUZZY, OF DAYTON, OHIO, ASSIGNOR TO THE NATIONAL CASH REGISTER COMPANY, OF DAYTON, OHIO, A CORPORATION OF OHIO, (INCORPORATED IN 1906.)

CASH-REGISTER.

No. 928,267.

Specification of Letters Patent.

Patented July 20, 1909.

Application filed October 18, 1906. Serial No. 339,540.

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 registers of the type patented in Great Britain October 19, 1904, No. 22,535 to Frederick Lincoln Fuller.

Some of the several objects of the invention are to provide a machine of the type or class mentioned, with throw-out mechanism for the counter, and certain improved mechanisms for preventing any mischievous or improper manipulation of the machine.

With these and incidental objects in view, the invention consists in certain novel features of construction and combination 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.

Of said drawings: Figure 1 represents a rear elevation partly broken away of the upper portion of the machine of the type mentioned; the cabinet or inclosing casing being omitted. Fig. 2 represents a transverse vertical section through a machine of the type mentioned with my improvements applied thereto; the cash drawer being omitted. Fig. 3 represents an end elevation of the machine of the class mentioned, illustrating the tape printing mechanism. Fig. 4 represents a vertical section partly broken away of one of the key banks and cooperating parts. Fig. 5 represents a detail rear elevation of the cross shafting and gears. Fig. 6 represents a detail rear elevation of the main clutch. Fig. 7 represents a detail section, partly in side elevation, through one of the counter operating gears and its connections. Fig. 8 represents a detail top plan view of the counter.

As numerous parts shown in the present illustrations are also shown and fully described in the aforesaid British patent, attention is directed to this patent for such detail description of the parts and their operation as is not hereinafter given. Described in

general terms, however, the machine may be said to comprise a series of banks of keys 1 representing amounts, a special group of keys 2 representing clerks, and three special keys 3, 4 and 5 representing respectively "Paid out", "Received on account" and "Charge" transactions. It is with these three latter keys and their relation to the mechanism of the machine that one of the principal features of this invention has to do.

The action of the amount keys 1 in connection with the registering, indicating and printing mechanism is best illustrated in Fig. 2. By reference to this figure it will be seen that the keys 1, which are of the usual spring-pressed type are provided with transverse pins 6, which, when a key is depressed, contact a pivoted latch lever 7 mounted upon a transverse shaft 8, and rock said lever to disengage its latching nose 9 from a pin 10 mounted upon a spring-drawn segment 11, which is in turn pivoted upon the main transverse shaft 12. This segment 11 carries a stop pin 13, which, when the segment is released as above described, passes forward and downward with the segment until it contacts with the lower end of a depressed key, when the segment is arrested.

Each of the segments 11 meshes with a mutilated gear 14 journaled upon a transverse shaft 15. These gears 14 mesh with pinions 16 fast to indicators 17, which are journaled upon a shaft 18 and are located in a group at the left hand end of the machine. The right hand group of indicators 19, which are located at the opposite end of the machine upon the shaft 18, are provided with pinions 20, (see Fig. 1.) which mesh with mutilated gears 21, mounted loosely upon the shaft 15 and corresponding to the gears 14. This latter group of indicators 19 is intended for indicating at the back of the machine, while the first named group constitutes an indication showing at the front of the machine. The gears 14 and 21 in each instance are connected for synchronous movement, by transverse shafts 22, suitably journaled in the main frame 1^a of the machine and each provided with pinions 23 tight thereon and meshing with their respective gears 14 and 21.

The shafts 22 are extended, and are provided with pinions 24 which mesh with mutilated gears 25^a provided with printing types, as best shown in Fig. 3. The inking and impression devices which cooperate with

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these types are fully shown and described in the aforesaid patent, and reference is made thereto for further description of the same.

As best shown in Figs. 7 and 8, the register or counter comprises a series of numbered wheels 25 mounted upon a shaft 26, and each of the same provided with a ratchet wheel 27 fast to a sleeve 28 carried by the said wheel 25. Located on the shaft 26 adjacent each of the ratchet wheels 27 is a mutilated gear 28^a carrying a spring pressed pawl 29 which engages the teeth of its respective ratchet 27. Each of the mutilated gears 28^a meshes with a large gear 29^a mounted upon the shaft 15, and each of these gears in turn meshes with a pinion 30 carried by a collar 31, (see Fig. 5.) which is loosely mounted upon its respective shaft 22 and held in position by a collar 33 tight on its shaft. Adjacent each of the pinions 30 is a corresponding pinion 34 tight on its shaft 22.

It will be seen from the above that each of the shafts 22, excepting that which connects the two special clerks' indicators, is provided with a pair of pinions 30 and 34; the first being loose on the shaft and connected to the registering gear, while the latter is fast on the shaft. During the normal operation of the machine each pair of these gears 30 and 34 is connected to move together by a pinion 35 mounted upon a short arm 36, which is fast to one of a series of rock shafts 37 extending across the machine, as best shown in Fig. 7. By this mechanism any motion transmitted by the shafts 22 will be communicated through the pinions 34 and 35 to the pinions 30, and from them through the gears 29^a to the counter wheels; the pawls 29 riding idly over the ratchets 27 upon the backward movement of the gears. The object of the connecting pinions 35, carried by arms 36, is to provide means whereby, when desired, the counter operating gears may be thrown out of action while still permitting the indicating and printing mechanisms to perform their usual functions. To accomplish this result the shafts 37 are provided near their left hand ends, with mutilated pinions 38, which mesh with a rack segment 39 journaled on the shaft 15 and normally drawn backward by a coil spring 40 which connects it to the main frame. The segment 39 is formed with rack teeth 41, which mesh with corresponding teeth 42 formed upon a segment 43, which is pivoted upon the shaft 8 and formed with a forwardly and downwardly projecting arm 44, the lower end of which is drawn forward by a coil spring 45 which connects it to the stationary parts of the machine. The downwardly extending arm 44 is cut away as shown in Fig. 2 so that it will not be moved by the pins on the six upper keys in the bank but each one of the three lower keys is adapted to engage its pin 6 with the edge of the arm 44 and rock the same against the ten-

sion of spring 45. This will evidently rock the segments 39 so as to rotate the mutilated pinions 38. These pinions as before stated are fast on the shafts 37 which control the intermediate pinions 35 so that when one of the said three lower keys is depressed the pinions 35 are immediately rocked out of engagement with the pinions 30 and 34. It will be seen from this construction that the counter is normally connected for operation or in other words that the connections are normally effective. When the lower keys in the bank (shown in Fig. 2) are depressed, these keys being used for certain special transactions, connections will then be disabled so that the counter will not be operated at the particular operation of the machine.

The locking devices which are a part of this present invention are best shown in Fig. 7 but some of the operating devices therefor are shown in Figs. 2 and 4. Referring to Fig. 2 it will be seen that the gears 14 are normally locked by pawls 51, these pawls being rigid with shaft 8. These pawls 51 are also shown in Fig. 4. On this figure is also shown arm 52 serving to lock a main segment 53 carried loosely by the main shaft 12. The arm 52 is also provided with a curved arm 54 the forward end of which passes through a hole in a release key 55. The segment 53 carries a rack 54 meshing with a pinion 55^a loosely journaled on the shaft 56. This shaft 56 and pinion 55^a are also shown in Fig. 6 and it will be seen from this figure that the shaft 56 carries a pin 57 projecting in a slot of one member 59 of a clutch, the other member 60 being connected to the pinion 55^a by a sleeve surrounding shaft 56. The shaft 56 is adapted to be given a complete rotation at each operation of the machine for the purpose of releasing the drawer latch, sounding an alarm and releasing the platen. The machine is adapted to be operated by a handle carried rigidly on shaft 12 and also carried by this shaft is a frame comprising arms 61 which are connected by a rod 62, these parts being shown in normal position in Fig. 2. The pinion 55^a has connected to it or to its carrying sleeve a spring 63 adapted to give the shaft 56 its rotation as before stated. When the special key 55 is depressed arm 54 is rocked thereby releasing arm 52 from the main segment 53, or rather, the arm is raised nearly above the periphery of the segment 53 so that the cam portion of said segment, indicated by numeral 64 may complete the elevation of the arm 52 and thereby withdraw all the locking pawls 51 from the gears 14. The spring 63 then relaxes giving shaft 56 a complete rotation through the clutch 59—60 and causing a partial rotation of segment 53. When the main handle is oscillated in a direction which in Fig. 4 would be clock wise the rod or bar 62 will strike a spoke edge 68 of the segment 53 and return the

same to the position shown in said figure. This evidently causes a reverse rotation of the pinion 55* and again tensions spring 63 but does not reversely rotate shaft 56 as will be clear from the type of clutch used. It will be evident from the preceding description that shaft 56 is given a complete rotation at each operation of the special key but is not turned when the handle is operated.

Referring now to Fig. 7 the shaft 56 is shown in this figure as carrying a cam 71. A second shaft 72 which may be termed the transfer controlling shaft is adapted to be given an oscillation to an extent equal to 9/10 of a complete rotation in each direction at each operation of the handle. This movement is caused through the agency of a pinion mounted on this shaft meshing with a gear carried rigidly by shaft 12. These parts are not shown in the present drawings in as much as they are found in the patented machine. I provide a plurality of locking pawls 81 for the mutilated gears 28*. These pawls act as retaining pawls during the forward movement of the said gear and when the pin 13 is moved into contact with the depressed key the said gear is locked against movement in either direction being unable to move forwardly because of the key and being equally unable to move rearwardly because of the pawl 81. It will be clear that some means for withdrawing this pawl is necessary to allow for the return of the parts to normal position. This means is found in a sleeve 82 rotatable with a transfer shaft 72. The sleeve 82 is broken away and the edge thereof is normally nearly in contact with the tails of the pawls 81, the contacting edges being so shaped that an oscillation of sleeve 82 will cam the tails of pawls 81 outwardly thereby withdrawing the points of the pawls from the gears 28* and maintaining them out of locking position until the transfer shaft has resumed its normal position and the entire mechanism has been reset.

With the construction as thus far described it would be possible to slightly start the main handle thereby moving the sleeve 82 enough to withdraw pawls 81 from the gears 28* and then to manipulate the machine by manually operating the printing segments 25 shown in Fig. 3. To prevent this I provide a series of detent pawls 84 also carried loosely on the rod 85 supporting pawls 81, these pawls 84 being adapted to engage the teeth of gears 29*. As shown in Fig. 7 the pawls 84 have depending teeth 86 adapted to be normally engaged by the sleeve 82 and depressed against the tension of springs 87 from the teeth of gears 29*. When the sleeve 82 begins to rotate or in other words when the handle is started the pawls 84 immediately rise into contact with the teeth of gear 29* thereby preventing any forward motion of the same so that the ma-

nipulation above referred to is prevented as nothing except a rearward motion could be given a printing segment and this will in any case be given by the operating handle.

It is desirable to lock the gears 28* except when it is desired to operate them and to this end I provide means for positively locking the pawls 81. This means comprises a rod 91 carried by arm 92 of a frame loosely carried by the transfer shaft 72. The arms 92 have a depending arm 93 connected through a pin 94 to a link 95 carrying at its rear end an anti-friction roller 96 adapted to be engaged by the cam 71. This link is supported by the arm 93 and by the shaft 56. It will be clear that the pawls 81 must be unlocked when the differential mechanism moves forward until stopped by the key and must also be unlocked when the parts are to be reset. The first of these objects is attained when shaft 56 begins to rotate in as much as the first movement thereof carries the cam 71 away from the anti-friction roller 96 when a spring 97 will pull the link 95 forwardly thereby rocking the frame 92 and carrying a rod 91 above the projecting tails 98 of the pawls 81. It will be clear that then the gears 28* may be moved forwardly as the pawls 81 at this time act merely as detent pawls. When the parts are to be restored the rod 91 must be again withdrawn from locking position and this is accomplished by the transfer cams 101 which are adapted to strike the upturned end 102 of the link 95 and rock the same around the pin 94 which then acts as a pivot. Such rocking of link 95 will raise the anti-friction roller 96 above the cam 71 when the spring 97 will immediately pull the link 95 forwardly as was the case when the cam 71 moved away from the roller 96. It will be clear that this will again release pawls 81 so that the sleeve 82 may remove them entirely from the path of the teeth of gears 28*.

In machines of the type shown in the present drawings and which depend for their operation upon the movement of the parts by springs it is possible when some of these parts project externally of the cabinet (such as the printer segments) to grasp such parts and hold the mechanism against operation in its proper time, thus causing the machine to print one amount and add another. By manipulation of the printing segments the machine might also be pumped to add a number of successive amounts which are not printed or indicated. With the present improvements, however, the parts are so locked that this manipulation is impossible and should the printing segments be once arrested by hand they cannot be again moved before the next operation of the machine.

It will be seen from the preceding description that the objects referred to in the beginning of the specification are well carried out by the mechanism as described. When a

special transaction is to be entered in the machine the depression of the proper key 3, 4 or 5 will withdraw the pinions 35 from their normal effective position as connecting devices so that a subsequent operation of the machine will produce no effect upon the register. The release of the depressed special key however allows the mechanism to resume its normal position so that the counter again becomes operative. The counter controlling gears 28^a are normally locked but are released when the shaft 56 is moved under the tension of spring 63 and are also released when the transfer shaft 72 is operated, this being coincident with the restoration of the movable parts of the machine. The pawls 84 are normally in outward position to allow forward movement of gears 29^a but as soon as the main handle starts to restore the parts these pawls move to a position locking the gears 29^a against forward movement.

While the form of mechanism here shown and described is admirably adapted to fulfil the objects primarily stated, it is to be understood that it is not intended to confine the invention to the one form of embodiment herein disclosed, for it is susceptible of embodiment in various forms all coming within the scope of the claims which follow.

What is claimed is as follows.

1. In a machine of the class described the combination with a series of oscillating operating elements, of a series of accounting elements, a printer, transverse shafts connecting operating elements and printer, connecting devices mounted on said shafts and arranged to be connected and disconnected from the accounting elements, and a controlling means for effecting the connection and disconnection of said connecting devices from the accounting elements.

2. In a machine of the class described the combination with a series of operating elements, of a series of indicators, transverse shafts connecting the operating elements and indicators, a series of counter elements, means mounted on the shafts for connecting and disconnecting said shafts and said counter elements, and means for effecting this connection and disconnection.

3. In a cash register, the combination with registering elements, of means for operating same, means adapted to drive said operating means, devices normally connecting said operating and driving means, and keys for withdrawing said devices from connecting relation.

4. In a cash register, the combination with registering members, of operating gears for same, driving gears for said operating gears, pinions normally connecting said operating and driving gears, and special manipulative devices for moving said pinions to disconnect said gears.

5. In a cash register, the combination with register elements, of operating devices for same, actuating devices for said operating devices, connections between said actuating and operating devices and keys for positively withdrawing said connections from connecting position.

6. In a machine of the class described the combination with a series of operating elements, of a series of counter elements, transverse shafts connected to the operating elements, means mounted on the shafts for connecting and disconnecting said shafts and said counter elements, and means for effecting this connection and disconnection.

7. In a cash register, the combination with a series of amount controlling devices, of operating mechanism having its movement controlled by said devices, a printer a shaft connecting the operating mechanism and printer, pinions on said shaft, a registering mechanism to which one pinion is geared, means for connecting said pinions and keys for disabling said connecting means.

8. In a cash register, the combination with registering devices, of operating mechanism for same, driving devices for said operating mechanism, means for connecting said operating mechanism and driving devices, and keys and gear connections operated thereby for withdrawing all said connecting means positively.

9. In a machine of the class described the combination with a series of operating elements, of a series of counter elements actuated thereby, means for moving the operating elements in opposite directions, lock pawls for locking the operating elements against movements in opposite directions and mechanism for alternately bringing the locking pawls into engagement with the operating elements.

10. In a cash register, the combination with a register, of operating gears for same, actuating gears for said operating gears, pinions normally connecting said gears, special keys and cam devices positively operated thereby for withdrawing said pinions from connecting position.

11. In a machine of the class described, the combination with an operating mechanism including an escapement, of locking devices for the operating elements controlled by said escapement for locking said elements against unauthorized movement in either direction.

12. In a cash register, the combination with an oscillating actuating device and a register element controlled thereby, of mechanism normally locking said actuating device against movement in either direction, a cam for releasing said device to enable it to move in one direction and a second cam arranged to release said actuating device for movement in the opposite direction.

13. In a cash register, the combination with an oscillating operating device, of a register element movable in one direction thereby, means for locking said element, a shaft given a complete rotation at each operation and serving to release the locking means during its rotation, and an oscillating transfer shaft also serving to release said locking means.

14. In a cash register, the combination with an oscillating operating device, of a register element having a one way connection therewith, a pawl for locking said actuating element, a pin holding said pawl in locking position, a shaft having a cam for holding said pin normally in locking position, and a second shaft having a cam for releasing said locking device.

15. In a cash register, the combination with an oscillating operating device and a registering element operated thereby, of a restoring shaft for said operating device, a transfer shaft, a shaft given a complete rotation at each operation, means for locking the registering element, and means operated by said transfer shaft and said rotating shaft to release said locking device while either shaft is out of normal position.

16. In a cash register, the combination

with a register wheel and an oscillating operating device for same, of means for restoring said device to normal, means normally locking the operating device, and a transfer shaft serving to release the locking device.

17. In a cash register, the combination with a register and an oscillating operating rack for same, of a detent for locking said rack, a spring driven shaft given a complete rotation at each operation, and means operated by the said shaft for releasing the locking device during the rotation of the shaft.

18. In a cash register, the combination with a register and an oscillating operating rack therefor, of a pawl for locking said rack, and means for holding said pawl in locking position, a motor operated shaft given a complete rotation at each operation, and a transfer shaft given an oscillation at each operation, said motor and transfer shafts each having means for withdrawing the holding means while the shaft is out of normal position.

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

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Witnesses:

H. D. JAMESON,
A. NUTTING.