

A. S. McCASKEY.

AUTOMATIC CHECK HANDLING ATTACHMENT FOR CALCULATING AND LISTING MACHINES.

APPLICATION FILED MAY 19, 1903. RENEWED AUG. 3, 1909.

951,143.

Patented Mar. 8, 1910.

3 SHEETS—SHEET 1.

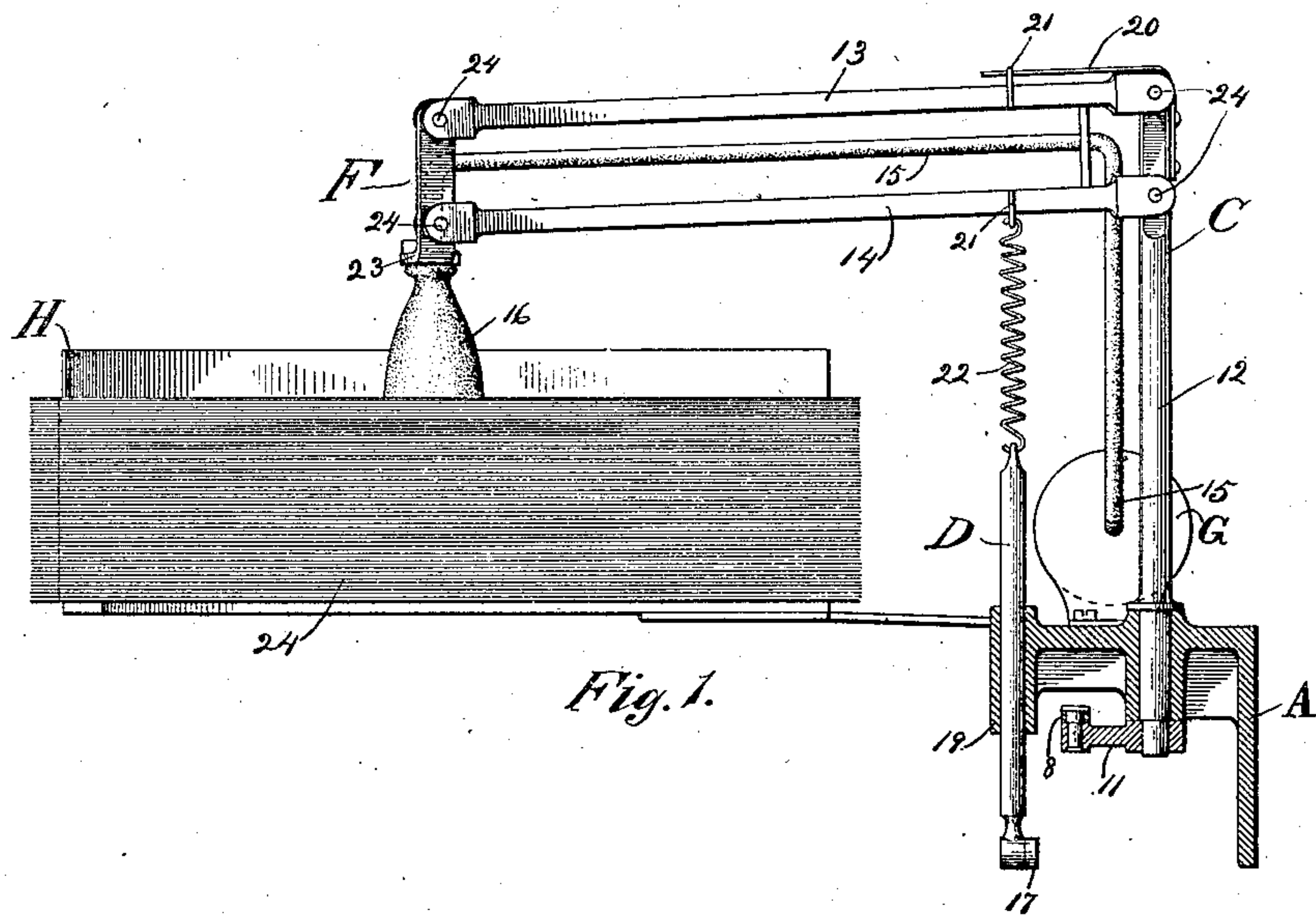


Fig. 1.

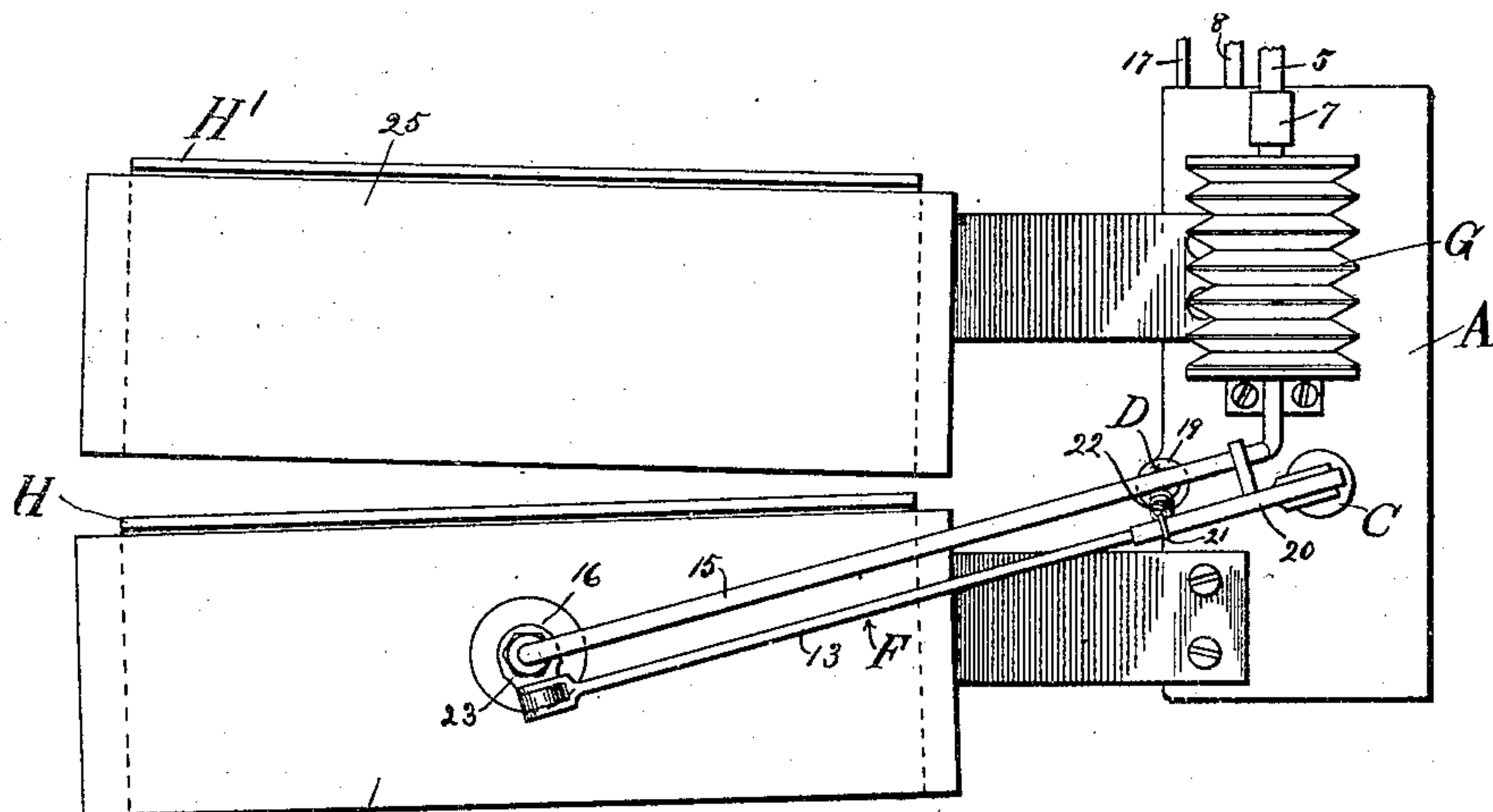


Fig. 2.

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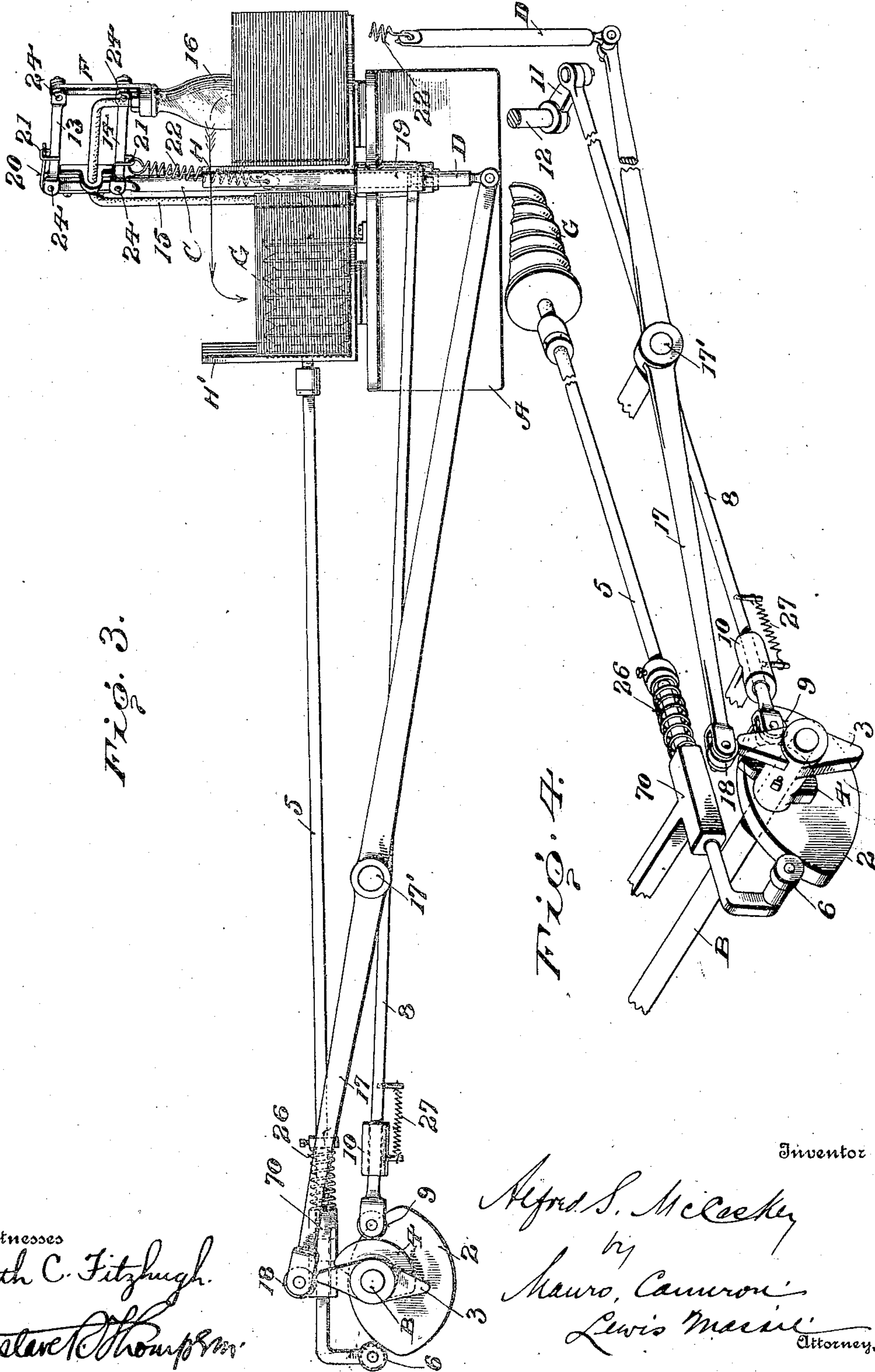
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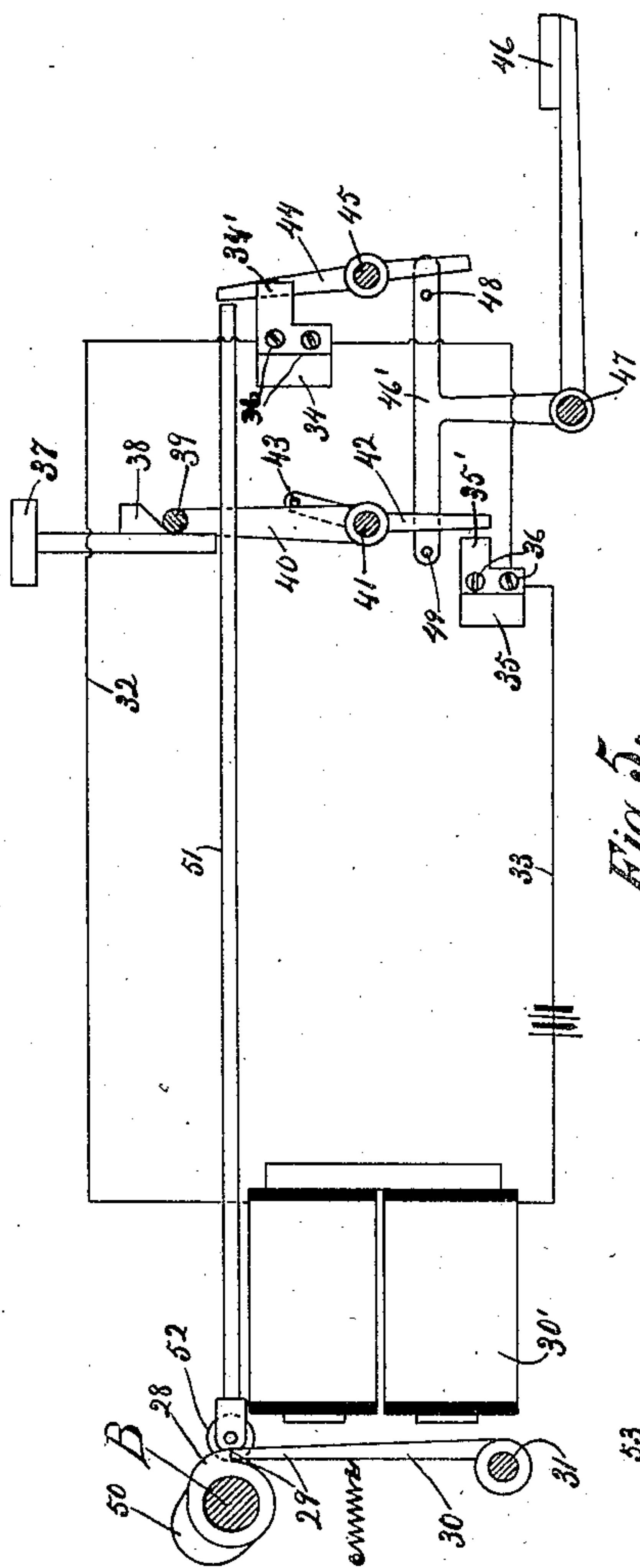


Fig. 5.

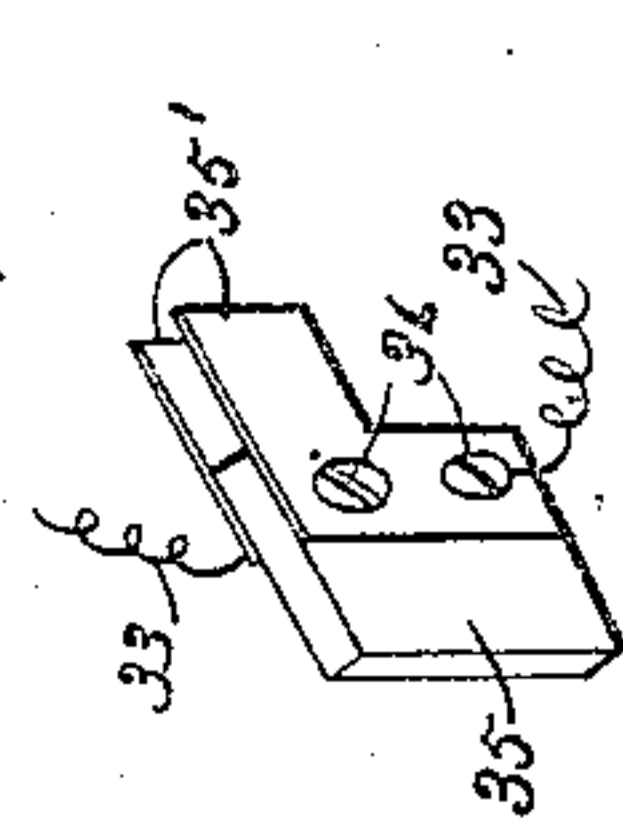


Fig. 7.

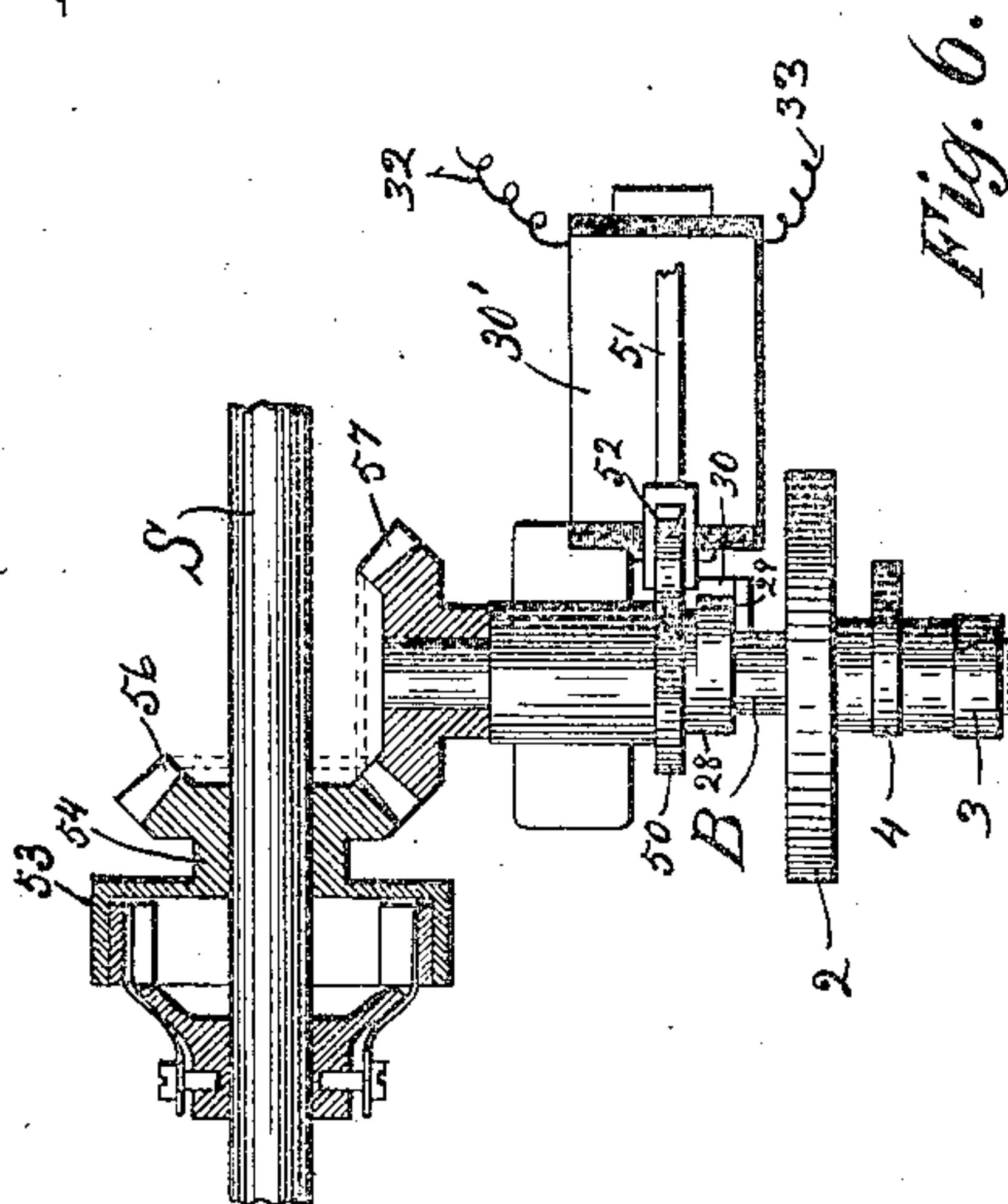


Fig. 6.

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UNITED STATES PATENT OFFICE.

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AUTOMATIC CHECK-HANDLING ATTACHMENT FOR CALCULATING AND LISTING
MACHINES.

951,143.

Specification of Letters Patent.

Patented Mar. 8, 1910.

Application filed May 19, 1903, Serial No. 157,770. Renewed August 3, 1909. Serial No. 511,057.

To all whom it may concern:

Be it known that I, ALFRED S. McCASKEY, a citizen of the United States, residing at Chicago, Cook county, Illinois, have invented certain new and useful Improvements in Automatic Check-Handling Attachments for Calculating and Listing Machines, of which the following is a specification.

This invention relates to calculating and listing machines, and particularly to attachments therefor adapted to automatically transfer from one pile to another individual checks, drafts, notes, and the like, as each is viewed and listed.

My invention contemplates the absolutely automatic handling of such papers, the operation being preferably timed so that each paper is lifted from one pile to the other immediately upon the depression of the first value-determining key struck, of the calculating or listing machine, whereby said paper is transferred during the subsequent depression or striking of other keys and the transmission of the number to the calculating or printing mechanism, immediately exposing to view the next succeeding paper underneath.

The object of my invention is to facilitate the listing of checks and similar papers as carried out by various forms of calculating and listing machines, with a view to increasing the speed at which the work may be accomplished and eliminating all manual effort.

With these and other objects in view, my invention consists, generally, in a swinging arm provided with means for picking up or securing a check or similar paper, and means for raising said arm, moving the same horizontally, lowering said arm, releasing said paper, and returning it to the original position.

My invention further consists in the novel means for picking up or lifting said paper.

My invention further consists in the novel means employed for breaking and controlling the movement of said arm.

My invention further consists in the novel manner of timing all operations whereby the check or paper is transferred at the

proper time and the parts returned to normal position for a repetition of the operation.

My invention further consists in connecting means between said arm and the key-board of the machine whereby the check lifting operation is started immediately upon the depression of the first digit or value-determining key, representing the first numeral in the number or value indicated by the check or paper.

My invention further consists in the novel manner of employing normally open electric circuit to properly time the various operations, in means upon the digit keys of the machine to close said circuit, and in positive means for breaking said circuit at the proper time. And my invention further consists in the various details of construction and in combination of parts all as hereinafter described and particularly pointed out in the claims.

My invention will be more readily understood by reference to the accompanying drawings, forming a part of this specification, in which I have shown a practical and convenient embodiment thereof, and in which—

Figure 1 is a side elevation of a check handling device with its operating parts. Fig. 2 is a top plan view thereof. Fig. 3 is an elevation looking from the left of Fig. 2. Fig. 4 is a perspective view of parts of the mechanism shown in Fig. 3. Fig. 5 is a diagrammatical view, showing a power shaft, one of the digit keys of the machine, an electric circuit, and the manner of closing the same. Fig. 6 is a plan view of a portion of the cam shaft showing its connection with a constantly rotating shaft, through a friction clutch and miter gears. Fig. 7 is an enlarged detail view of one of the circuit closers or spring contacts.

Referring now to the drawings in detail, A represents a base or support for the mechanism, which may be a bracket secured to the calculating or listing machine. In and upon the support A are suitable bearings for the horizontal cam shaft B, a crane or carrier C and an actuating slide-rod D for the arm

F of said crane. Said support also carries a bellows G, and projecting arms or brackets carrying shelves H and H'.

The actuating parts comprise the shaft B upon which three cams are fixed, numbered 2, 3 and 4, of varying eccentricity. The cam 4 swings, or transmits a rotary motion to, the vertical post of the crane. The cam 3 operates the arm of the crane and the cam 2 operates a pneumatic check-grip on the end of said arm, each movement being timed by the arrangement of the cams to take place at the proper moment; or, in other words, starting from the position of the mechanism shown in Fig. 1, the cam 2 first expands the bellows G, creating a suction or partial vacuum, which grips the topmost of the stack of checks. Immediately thereafter, and while the suction is continued, the cam 3 permits spring 20 to raise the arm of the crane and lift the check from its position and, when raised, cam 4 permits spring 27 to swing the crane to the desired point of deposit of the check. Immediately thereupon, the cam 2 permits spring 26 to compress the bellows releasing the check, the cam 4 swings the crane back, and the cam 2 lowers the crane arm into position shown in Fig. 1, whereupon the operation may be repeated.

Referring now to the details of said mechanism. As will be noted in Fig. 3, substantially one-half of the circumference of each of the cams 2 and 4 describes an arc concentric with the shaft B, whereas the other part of the circumference describes an arc eccentric to the shaft. These cams therefore transmit movements during about one-half of their revolutions, whereas cam 3 has a circumference which is practically all eccentric to the shaft. The cam 2 is operatively connected with the bellows G through the reciprocating bar 5, attached at one end to the bellows, the other end thereof being bent at an angle and carrying an anti-friction roller 6, engaging the periphery of the cam 2. This bar is slidably held in bearings 70, mounted on the base A. The cam 4 operates against a similar bar 8, having an anti-friction roller 9 and slidable longitudinally in fixed bearing 10, also suitably secured to the base or support A, the latter bar being pivoted at its other end to the crank 11, of the post 12, carrying the parallel bars 13 and 14 of the arm and a portion of the air-tube 15 connecting the bellows G with the flexible suction cup 16. The cam 3, on the other hand, rocks a lever 17, pivoted at one end to the slide-rod D, slidably held in the base and having its other end provided with a roller 18. This lever is fulcrumed upon a suitable support 17' between the shaft B and the slide-rod D held for slidable movement in the bearings 19.

The angle-spring 20, suitably secured to

the post 12, by screws, rivets or otherwise at one end, and at the other end linked to the arm F by means of the link 21, tends to raise said arm and provides the force imparting an upward movement thereto. The downward movement is imparted to the said arm through the slide-rod D, and an elastic connection or spring 22 connects the slide-rod D with the arm F.

The parallel bars 13 and 14 of the crane arm F are forked at their ends and embrace both sides of the post 12 and the bent bracket 23 to which the suction or vacuum cup 16 is secured, and are pivoted to said arms by means of pivots 24. A suitable aperture is provided in said bracket communicating with the interior of the cup in which aperture the end of the flexible tube 15 is fixed. Numeral 24' refers to a stack of checks, ready for listing, and 25 refers to checks already listed and transferred from the shelf H to the shelf H'. As the cams, in the form of my invention herein illustrated, contact merely with the anti-friction wheels and are not connected thereto, they are incapable of transmitting movement to the bars and lever except in one direction. The spring 22 provides for movement of bar 17 in the opposite direction, and springs 26 and 27 resist the force of the cams 2 and 4 and move bars 5 and 8 in the opposite direction. It is obvious that the cams may be made to reciprocate the parts both ways by numerous expedients well known in the art of cam actions.

In the foregoing description, the shaft B has been treated as a part of the check lifting mechanism, but the same may represent a shaft of the calculating machine. In Fig. 5, I have illustrated, diagrammatically, the relation between the check lifting device and the calculating machine, whereby the rotation of a shaft B is controlled and timed to operate the check lifting mechanism at the proper moment. The shaft B, hereinbefore referred to, together with an additional cam and a catch thereupon, as shown at the left in Fig. 5, is also placed in operative relation to a mechanism forming a part of the calculating machine. In this mechanism 28 represents a collar, fixed upon shaft B, provided with a shoulder or catch 29 engaging the end of an armature 30 pivoted at 31.

30' is an electromagnet for actuating the armature, and 32 and 33 are wires leading from opposite poles of a suitable source of electric energy. Interposed in this circuit are two contacts 34 and 35, each of which consists of two spring plates, one above the other, suitably insulated from each other and held together by insulated screws 36. The wire 32 is connected to the lower and the wire 33 to the upper plate of each contact. The circuit, therefore, is normally open at the contacts 34 and 35.

37 refers to one of the digit keys of a cal-

calculating machine, each of which keys is provided with a contact block or shoulder 38 which operates against a projecting pin 39 upon the free end of an arm 40, pivoted at 41, and fulcrumed upon the same pivot is a lever 42 upon one end of which is a projecting pin 43 engaging the arm 40. The lower end of the lever is adapted to enter between the plates 35' and close a circuit at that point. A lever 44, pivoted at 45, is adapted to close the circuit in like manner between the plates 34'.

46 refers to the register bar, which may be substantially similar to the spacing bar of an ordinary typewriter. This bar is fixed to the pivot 47, and upon the latter is a series of T-shaped rocking members 46', one for each digit key. Each of these members is provided with projecting pins 48 and 49 for engagement with the levers 44 and 42, respectively. A cam 50 is fixed upon the shaft B for throwing the bar 51 in one direction, said bar being preferably provided with anti-friction roller 52.

The shaft B is constantly subject to a force which tends to rotate it, for example, as hereinafter explained, and when a key 37 is depressed the incline 38 thereupon will move the arm 40 against the pin 43 upon the lever 42, the lower end of which will be forced between the plates 35' closing the circuits; the circuit at 34, as shown being normally closed by a lever 44. When the circuit is closed to energize the magnet 30', the armature 30 will be withdrawn from engagement with the catch 29, permitting the shaft to rotate and therewith the cam 50. The latter, in turn, operating against the roller 52 will throw the rod 51 against the upper end of lever 44, thus breaking the circuit at 34 permitting the armature to return and engage the catch 29 on completion of one rotation. In the meantime, the circuit remains broken at 34, the lever 44 having been thrown over so that its center of gravity is on the opposite side of the pivot 45. The pin 48, on the release, will engage the lower end of lever 44 and limit its rotation. With the end of lever 42 held between the contacts 35', the upper end of lever 44 thrown out of contact with contacts 34, the operation of additional keys 37 will not therefore make it possible to again close the circuit by means of a key 37 until the levers 42 and 44 have been returned to a position shown in Fig. 5. This return of the levers is accomplished by depressing the register bar 46, which will cause the pin 49 to push the lever 42 out of, and the pin 48 to press the lever 44 into, engagement with their respective contacts. This return of the mechanism is accomplished without closing the circuit and actuating the mechanism above described, by so relating the engagements of pins 48 and 49

with levers 44 and 42 as to cause the lever 42 to be drawn out of engagement with its contacts 35 before the lever 44 is thrown into contact.

In the foregoing description, the key 37, incline 38, pin 39, arm 40, lever 42, and related parts, have been referred to as separate mechanism for each key. In practice, however, two arms 40, with a rod 39 therebetween and common to all of said keys, will be provided.

Referring to the operation of the mechanism shown in Fig. 5, in connection with the check-lifting mechanism shown in Figs. 1 to 4, inclusive, and assuming that the different elements are in the respective positions shown and the stack of checks 24 ready for listing or entry. If it is desired to list or add the amounts represented by these checks, the operator will glance at the check on the top of the stack and if the amount is, say, \$125.00, he will first depress a digit key 37 representing the digit "1." This operation immediately puts the check-lifting device into movement, transferring the check for \$125.00 from the shelf H to the shelf H' while the operator strikes the remaining keys 37 bearing the digits 2, 5, 0 and 0, successively, to complete the amount. The latter keys, as previously explained, do not further affect the mechanism, which remains in the position in which it has been placed by the depression of the first key. When the five keys comprising the amount of \$125.00 have been depressed and the check or paper moved to expose to view the next amount, the operator depresses the register bar 46, thereby opening the circuit between the contacts 35' and closing it between the contacts 34'. The above operation is repeated until all of the checks have been listed.

If it is desired to list the name of payee, date of check, etc., as well as the amount, or in other words to enter more than is possible in connection with an ordinary calculating machine, my check lifting device may be employed in connection with an ordinary typewriter by simply providing the letter keys and the spacing bar corresponding to the register bar 46 with the auxiliary parts or elements herein shown and described. Or, a single key 37 and a separate release key 46 may be provided to set the check lifting mechanism into operation and to reset the device. In this arrangement only one key 37 would be provided with the inclined shoulder 38 etc., and a single key corresponding to the bar 46 operating only in combination with that one key instead of all of the digit keys. It is obvious that the same arrangement may also be employed in connection with a calculating machine, if it is desired to avoid providing all of the digit keys with the shoulders. In its employment

in combination with a typewriter it is further obvious that other documents besides checks may be handled in the same way to relieve the operator of the inconvenience and the loss of time incident to picking up and transferring each sheet copied, thereby facilitating more rapid work.

I have referred to the shaft B as having a constant tendency to rotate, the force to accomplish which may be provided in a number of different ways. A constantly-rotating shaft S may be employed, if desired, provided, as shown in Fig. 6, with a friction clutch and comprising a cup 53 upon an independently-rotatable sleeve 54, sliding against the inner face of the cylindrical portion of which is a series of shoes 55 suitably connected to said shaft S and spring-pressed against said face. Should it be necessary to change the direction of motion the outer extremity of the sleeve 54 may be provided with a miter-gear 56 meshing with a similar gear 57 fixed to the shaft B. It is obvious that when the shaft B is checked or held against rotation, the shoes 55 will slide against said rim, the spring pressure being sufficient to cause rotation of the said shaft S immediately upon the release of said checking or holding means.

Many modifications of the details of my improved device for handling checks and the like will doubtless readily suggest themselves to those skilled in the art to which it appertains, and I therefore do not desire to limit my invention to the specific construction and manner of attachments to calculating, listing or printing machines herein shown and described.

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

1. In a device of the class described, the combination, with a key, of an arm, means for raising, moving laterally and lowering said arm and returning the same to its initial position, means normally checking movement of said arm, means interposed between said key and the arm operating means to release said arm upon operation of said key, means upon said arm for temporarily securing a sheet of paper thereto prior to primary movement, and means for releasing said paper at the end of said primary movement.

2. In a device of the class described, the combination, with a key, of an arm normally checked against movement, means for raising, moving laterally and lowering said arm and for returning the same to its initial position, means interposed between said key and the arm-operating means to release said arm upon operation of said key, a suction device at the extremity of said arm, means for creating and breaking a partial vacuum in said suction device, and means for interdependently timing the above operations.

3. In a device of the class described, the combination, with a key, of an arm normally checked against movement, means interposed between said key and said arm to release said checking means upon operation of said key, a suction device at the end of said arm, means for creating a partial vacuum in said device, means for raising, moving laterally and lowering said arm, means for breaking said vacuum, and means for returning said arm to its initial position.

4. In a device of the class described, the combination, with a key, of an arm normally checked against movement, means for raising, moving laterally and lowering said arm and for returning the same to its initial position, means interposed between said key and the arm-operating means to release said arm upon operation of said key, a suction cup at the extremity of said arm, an air pump having suitable connection therewith to exhaust air from and supply air to said cup, and means for interdependently timing operations of said arm and air pump.

5. In a device of the class described, the combination, with a key, of an arm, means for raising, moving laterally and lowering said arm and for returning the same to its initial position, means interposed between said key and the arm-operating means to release said arm upon operation of said key, a suction cup at the extremity of said arm, means for maintaining said suction cup in a vertical position throughout the movements of said arm, an air pump having suitable connections therewith to exhaust air from and supply air to said cup, and means for interdependently timing operations of said arm and air-pump.

6. The combination with means for automatically moving checks or sheets of paper from one position to another, of power driven connections for actuating said means, said connections including a constantly rotating driving shaft, a key, and means actuated from said key for controlling the operation of said check-moving means by said constantly rotating shaft through said connections.

7. The combination with means for automatically moving checks or sheets of paper from one position to another, and power driven connections for actuating said means, of a key, means actuated from said key for controlling the operation of said check-moving means by said power-driven connections, and means automatically arresting said operation at a predetermined point.

8. The combination with means for automatically moving checks or sheets of paper from one position to another, and power driven connections for actuating said means, of a key, and electrically operated means adapted to be thrown into operation by said key and controlling the operation of said

check moving means by said power driven connections.

9. The combination with means for automatically moving checks or sheets of paper
5 from one position to another, and power driven connections for actuating said means, of a key, and electrically operated means adapted to be thrown into operation by said
10 key and controlling the operation of said check-moving means by said power driven connections, and means automatically arrest-

ing said operation at a predetermined point and throwing said electrical means out of operation.

In testimony of the foregoing I have here- 15
unto set my hand in the presence of two witnesses.

ALFRED S. McCASKEY.

Witnesses:

GEORGE W. BURTON,
E. BERMAN.