

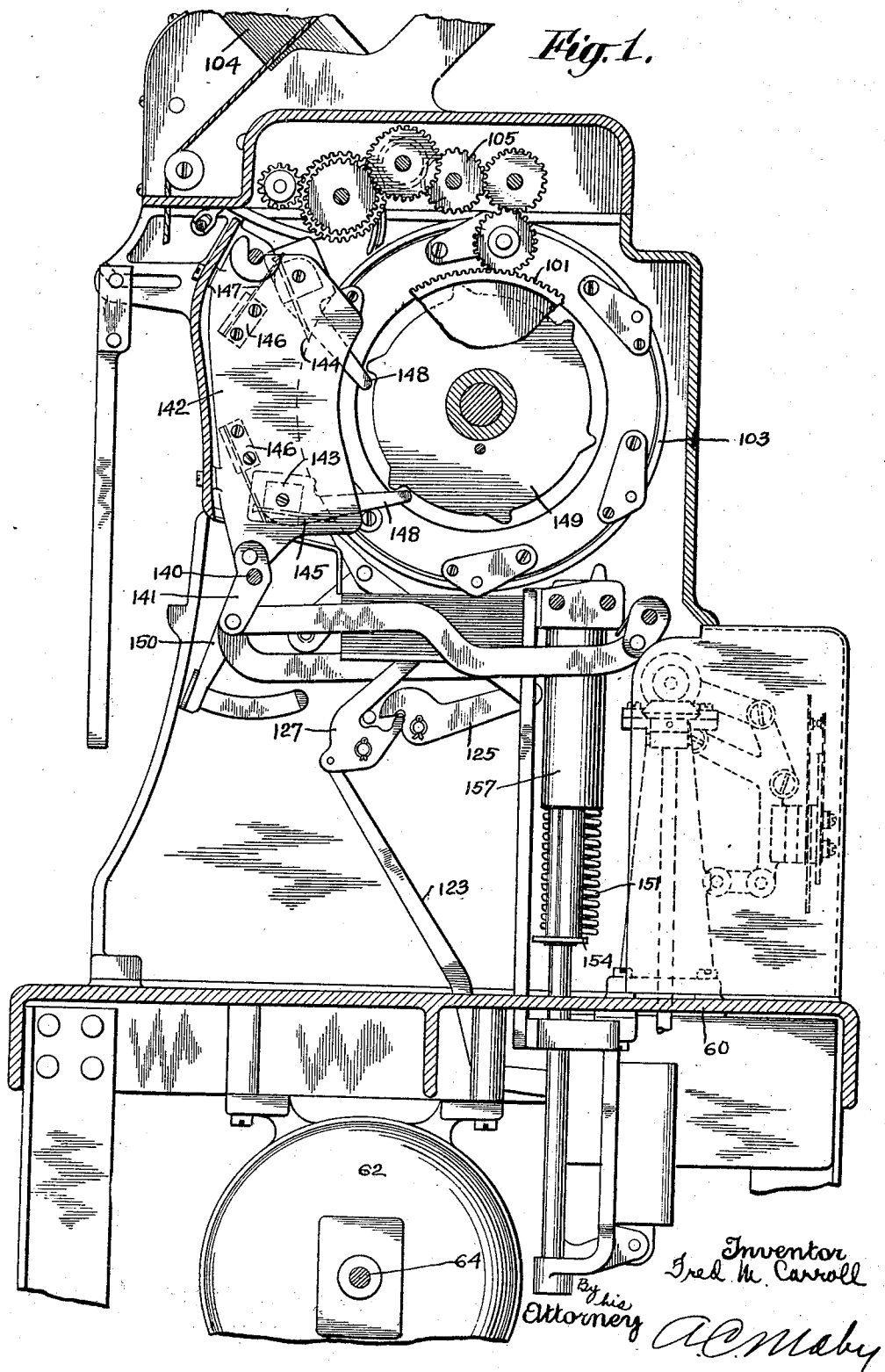
Oct. 13, 1931.

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1,826,992

CARD HANDLING DEVICE FOR TABULATING MACHINES

Original Filed Dec. 19, 1922 6 Sheets-Sheet 1



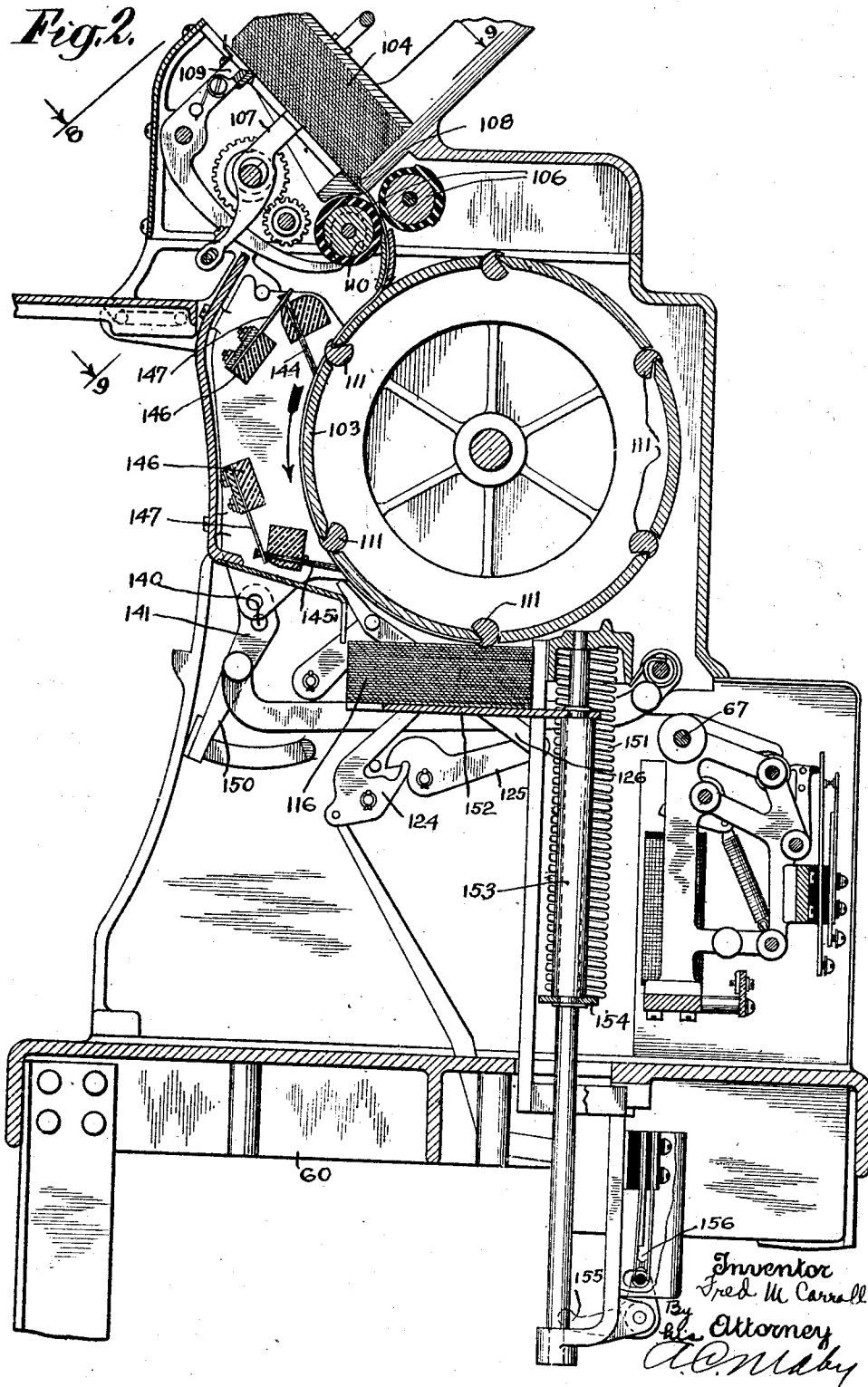
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CARD HANDLING DEVICE FOR TABULATING MACHINES

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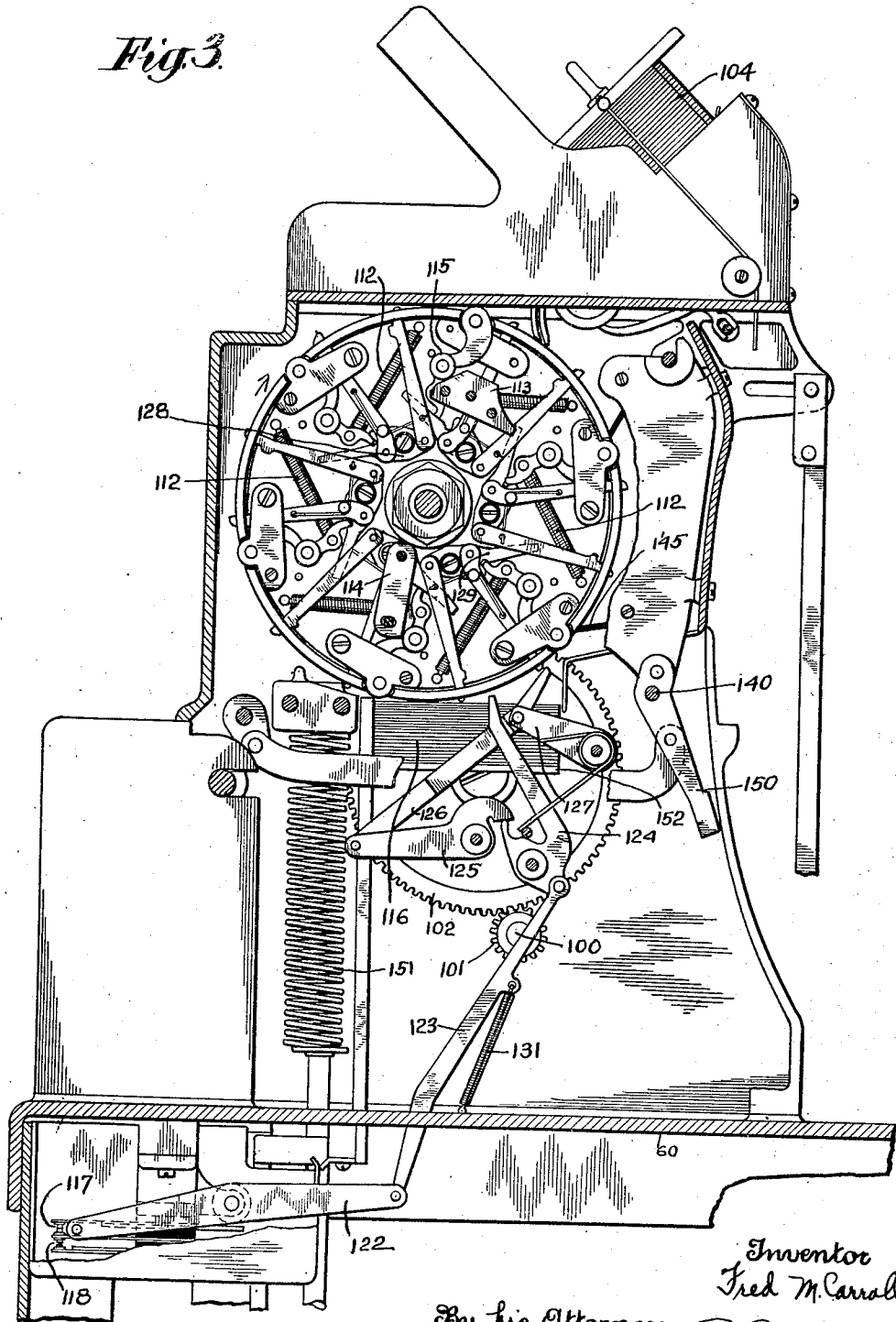
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CARD HANDLING DEVICE FOR TABULATING MACHINES

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Fig. 3.



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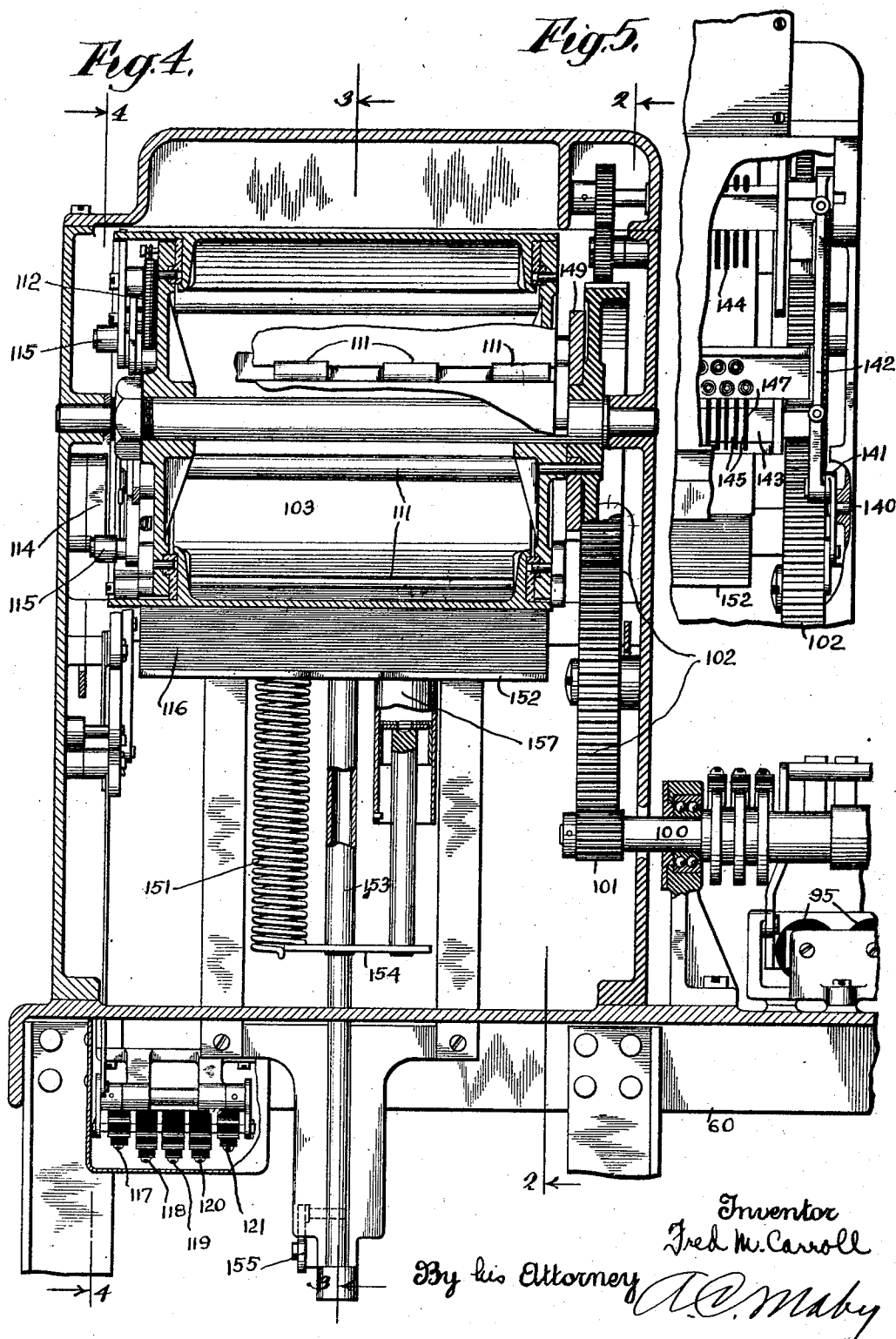
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CARD HANDLING DEVICE FOR TABULATING MACHINES

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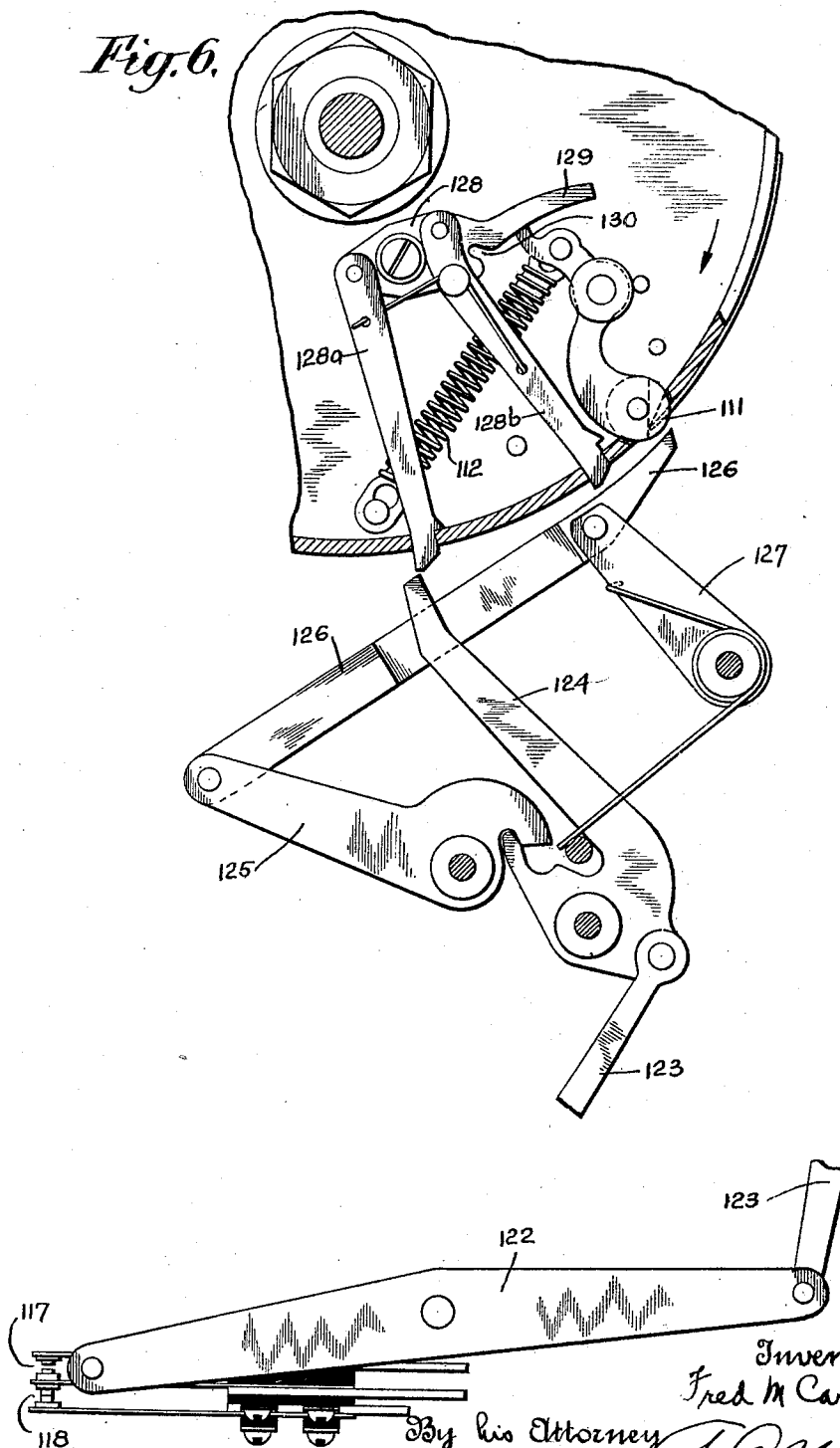
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CARD HANDLING DEVICE FOR TABULATING MACHINES

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Fig. 6.



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CARD HANDLING DEVICE FOR TABULATING MACHINES

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Fig. 7.

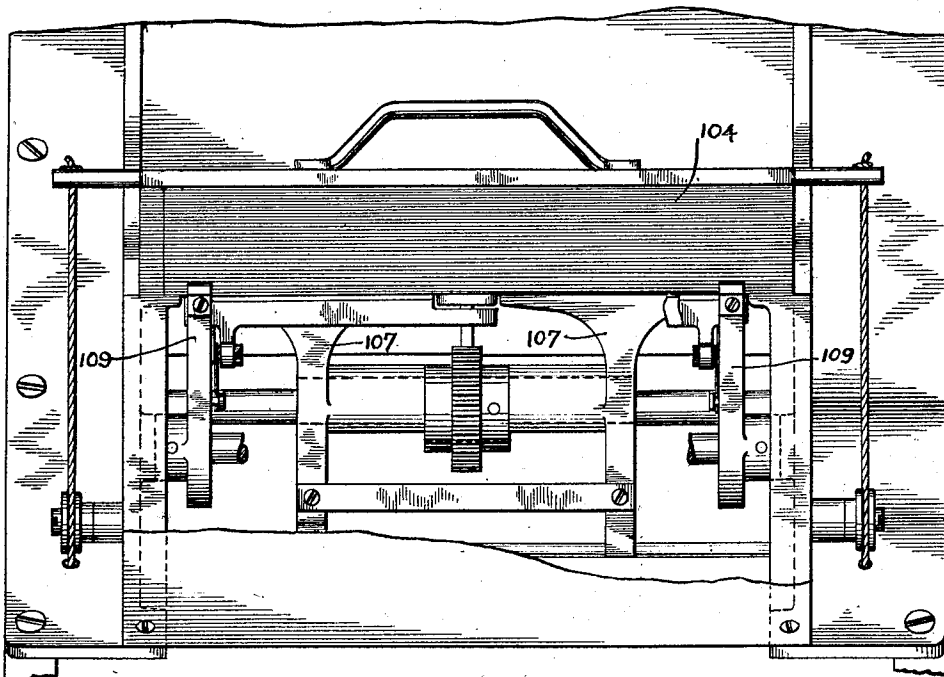
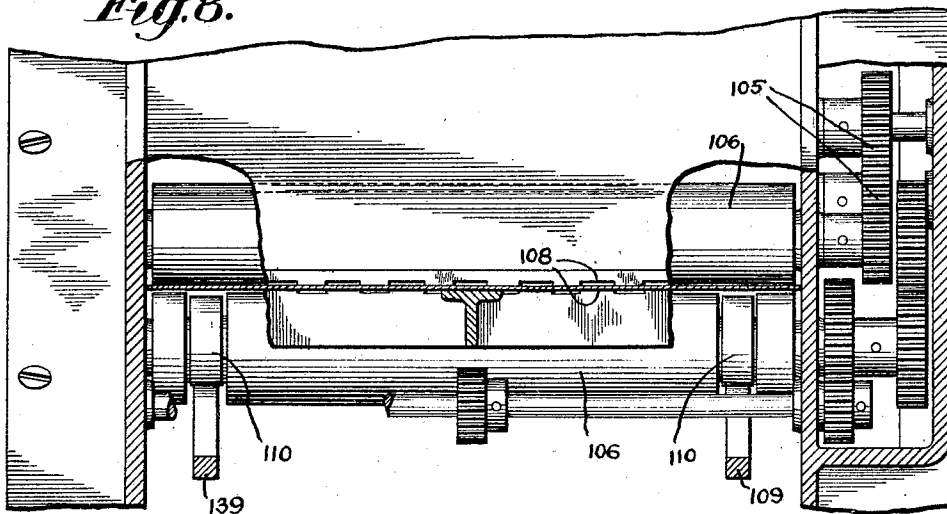


Fig. 8.



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UNITED STATES PATENT OFFICE

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CARD HANDLING DEVICE FOR TABULATING MACHINES

Original application filed December 19, 1922, Serial No. 607,847, and in Canada January 11, 1923. Divided and this application filed February 12, 1929. Serial No. 339,483.

This invention relates to card feeding and sensing devices for use in record card-controlled machines such as tabulating machines, sorting machines or the like. With machines of this character it has heretofore been the practice to feed the cards in a straight path through feed rolls and sense the perforation index point designations in said cards during their transit through the feed rolls. In the present invention provision is made for feeding the cards to a rotatable drum. Suitable gripper devices are disposed upon this drum to grip the cards thereon and carry them from the point of reception to a discharge position. Upon arriving at the discharge position the grippers are opened and the cards are discharged to a storage stack.

One of the objects of the present invention resides in the provision of improvements in the discharge magazine whereby cards may be received therein upon a yielding support or abutment. Subsequently upon the removal of cards from the magazine, provision is made for retarding the speed of return movement of said support.

Further objects of the present invention reside in improvements in the card throat structure whereby buckling of the cards through the throat is prevented.

A further object of the present invention resides in the provision of means for automatically suspending the operation of certain parts of the machine, such as the card feeding devices, when the discharge magazine receives a predetermined complement of cards.

A further object of the present invention resides in the provision of the improved means for controlling the operation of the machine according to the absence or presence of record cards upon the feeding drum.

In the drawings,

Fig. 1 is a sectional view of the card feeding section of the machine. This section is taken on line 2—2 of Fig. 4.

Fig. 2 is a vertical section of the card feeding drum at another point, the section being taken on line 3—3 of Fig. 4.

Fig. 3 is an end view of the card feeding

drum and associated devices and is a vertical section taken on line 4—4 of Fig. 4.

Fig. 4 is a central vertical sectional view of the card feeding drum.

Fig. 5 is a fragmentary detail view of the card feeding drum and the sensing brushes and also shows the driving gear for the drum.

Fig. 6 is an enlarged detail view of the finger members for controlling the card contacts according to the presence or absence of a card under the grippers of the card feeding drum.

Figs. 7 and 8 are detail views taken respectively on lines 8—8 and 9—9 of Fig. 2.

In more detail this application is a continuation of my application Serial No. 705,959, filed April 11, 1924 and a division of Serial No. 607,847, filed December 19, 1922. In the latter application description is made of the tabulating section of the machine. The present application is particularly directed to the card-feeding section of the machine and this section receives its drive from a shaft 100 (Fig. 4), which shaft is driven from the tabulating section of the machine in the manner described in my copending application above referred to.

Mounted on the end of shaft 100 is a pinion 101 (Fig. 4) which through gearing 102 is adapted to rotate a drum 103. This drum is provided with card clip devices which will hereafter be described.

To feed cards one at a time from a supply stack 104 (Figs. 1 and 2) a train of gears indicated at 105 is provided. These gears are adapted to drive card feeding rolls 106 (Fig. 2) and also to drive the mechanism which feeds the cards from 104 to the feed rolls. The mechanism for feeding the cards from the stack comprises finger members 107 which extend into cooperation with the rear of the stack of cards and these members are eccentrically mounted upon one of the rotating shafts driven by the gear train 105. The rear ends of these finger members 107 are fixed against movement, as shown in Fig. 2, so that upon the rotation of the eccentrics the fingers will move at their forward ends with a back and forth motion to take the cards one by one from the stack and advance

the same through the controlling throat 108 (Fig. 8) of the card magazine. After a single card is initially advanced by the fingers 107 a pivoted pusher member 109 (Fig. 2) swings in back of the rear edge of the card and advances the same into the bight of the rolls 106. The pusher 109 is suitably operated by cams 110 (Fig. 8) on the feed roll shaft. As shown in Fig. 2 the feed rolls 106 are provided with clearance portions to permit the feeding in of a card, the subsequent gripping of same by the feed rolls and the final release of the card when the latter is received by the clip devices. The throat 108 is provided with serrated edges, as shown in Fig. 8, to permit the passing of a card having some wavy edges through the throat. The throat will prevent the feeding of two cards at one time.

The card grippers are pivotally mounted in the drum 103 and extend slightly through the periphery thereof, as best shown in Fig. 2. Suitable slots are provided in the drum to permit the projection of the grippers. The grippers 111 are provided with springs 112 (Fig. 3) which normally tend to rock the grippers to engage and hold a card to the rotating drum 103. To open the grippers at the proper time and to permit the subsequent spring closure thereof fixed cam members 113-114 are provided. These are carried by the frame of the machine, as shown in Figs. 3 and 4, and cooperate with suitable follower rollers 115 which are carried by the gripper structure. The grippers are timed to operate at the proper time to successively receive cards from the feed rolls and to deliver same to the storage stack 116 (Fig. 3).

In order to control certain electrical circuits differentially according to the absence or presence of a card upon the drum and properly engaged by the grippers certain controlling devices are provided which will now be described.

As shown in Fig. 4 there are five pairs of contact devices 117, 118, 119, 120 and 121. These contacts are adapted to be operated by a yoke or bail carried by a pivoted lever 122 which through link 123 (Fig. 6) connects with a pivoted finger lever 124 having a portion engaging a notch upon pivoted arm 125. Arm 126 is connected to 125 and to a spring actuated link 127. Within the drum there are located a number of pivoted walking beam assemblies 128, one for each gripper. Each assembly carries a controlling plate 129 cooperating with a finger on the gripper assembly so as to be rocked to the position shown in Fig. 6, if a card is engaged by the gripper. If no card is gripped to the drum the gripper will engage in the notch 130 in plate 129. With a card in the grippers member 128a is projected. If cards are absent 128b is projected and 128a withdrawn. 128a when projected strikes 124 and elevates link

123 to effect the closure of the normally open contacts and the opening of those which are closed. On the other hand, 128b, when projected, strikes 126 and permits link 123 to be drawn down by spring 131 to reverse the contact conditions. The contacts 118 are thus closed as long as cards are feeding and open when the grippers fail to receive a card from the magazine. The opening of the contacts serves to deenergize the usual card feed clutch magnet whereupon the card feed clutch disengages and consequently the drum 103 ceases to rotate. The particular circuit arrangement through which this operation is performed does not enter per se into the present invention and will not be further described, one complete embodiment of it being fully described in the copending application above referred to.

Brush devices

Pivoted on studs 140 in the frame of the machine are arms 141 which in turn are pivotally connected to a brush holder frame 142 (Figs. 1 and 5). Pivoted in the frame 142 are insulated brush holders 143 which respectively carry the upper and lower brushes 144 and 145. These brushes cooperate with the index point perforations of the record cards which are carried by the drum and sense the readings thereon. Two sets of brushes are provided which cooperate with two successive cards for the purpose of comparing the cards to detect group changes therein. To conduct current to the brushes and to permit the pivoting of the brush holders fixed cross bars 146 (Fig. 1) are provided with individual brushes 147 cooperating with the brushes 144-145 respectively. In order to prevent the bending of the brushes at the time the clips pass thereunder the brush holders 143 are provided with fingers 148 (Fig. 1) which cooperate with a rotating cam 149 carried on the drum of the machine. These parts rock the brush holders each time the clips pass under the brushes so as to provide clearance therefor. The machine is also timed to stop with the brushes elevated from the drum so back circuits at this time will be prevented. The entire brush holder assembly and frame can be displaced away from the drum for inspection by depressing the key 150 (Fig. 1) which through a suitable linkage displaces the entire brush holder assembly about the supporting pivoted studs 140.

The storage magazine comprises a suitable hopper 152 which is resiliently supported by the spring 151 (Fig. 2) through the medium of a sleeve 153. The cross member 154 connects with the lower end of this spring 151 and this cross member is utilized to stop the operation of the machine when the magazine is filled with cards. It will be understood that in machines of this class the oper-

ation is to a large extent automatic and the machines frequently run for a considerable period without being under the direct attention of the operator.

Should the operator not remove the cards from the discharge magazine at periodical times this magazine will become completely filled and if the machine continues to run the cards will continue to be discharged into the magazine by the feeding devices which will result in the cards being thrown on the floor and possibly torn or damaged. I accordingly provide means for automatically stopping the operation of the machine when the card magazine receives a predetermined complement of cards. The direct means for stopping this operation comprises a pair of contacts 156 (Fig. 2), which contacts are disposed in one of the main control circuits for the tabulator. This circuit when opened will stop the tabulator in the usual manner and, in addition, it will also stop the operation of the card feeding attachment. To actuate the contacts pivoted member 155 is provided, which member is adapted to be rocked counterclockwise upon the descent of cross member 154.

If the cards are removed from the card mechanism means should be provided for preventing the upward slamming of the card magazine. Such improper operation is prevented by means of a suitable dash pot 157.

Claims:

1. In a card handling machine, in combination, a card feeding drum, a plurality of controlling contact devices, means carried by said drum for feeling for and determining the absence or presence of cards thereon, and means operated by the aforesaid means for actuating the contact devices in one direction each time a card is properly fed by the drum and for actuating said contact devices in a different direction upon the absence of cards properly positioned on the drum.

2. In a card controlled machine, card feeding means, a card supply pocket having a wall in front of the card feeding means and provided with a throat through which the forward edge of the card is advanced by the card feeding means said throat having a side provided with integral serrations extending transversely to the card surfaces to facilitate passage of a card with irregular front edges through the throat.

3. In a card machine, a card supply pocket having a feed throat through which the cards are fed, said throat having its confronting sides provided with integral serrations extending transversely to the card surfaces, the serrations of one throat side being staggered relative to the serrations of the other throat side.

4. In a card machine, card feeding means, a card supply pocket provided with a stationary feed throat in front of the feeding

means through which the cards are fed by said means, the throat sides being serrated in a direction transverse to the plane of the cards to permit passage of a card with irregular edges.

5. In a card machine, a movable card support, a pair of elements carried by the support, control devices selectively operable by either of said elements, and means for selecting one of the elements to operate in accordance with the presence or absence of a card in proper position on the support.

6. In a card machine, a movable card support, a pair of elements carried by the support, electrical contacts for controlling the machine and operable by either of said elements, and means for selecting one of the elements to operate in accordance with the presence or absence of a card in proper position on the support.

7. In a card machine, a movable card support, electrical contact devices for controlling the machine, said devices being removed from and exterior to the support, and means for operating said devices in different ways in accordance with the presence or absence of a card in proper position on the support.

8. In a card machine such as described in claim 7, said card support having grippers for securing the cards and for controlling the operating means for the contact devices.

9. In a card machine, a movable card feeding support, control devices for the machine, means for moving the control devices in one direction each time a card is fed in proper position on the support, and means for moving the control devices in a different direction in the absence of a card properly positioned on the support.

10. In a card machine such as described in claim 9, said control devices being removed from and exterior to the card feeder.

11. In a card machine such as described in claim 9, said feeder carrying grippers for securing the cards and for controlling the means for moving the control devices.

12. In a card machine such as described in claim 9, said control devices comprising co-operating electrical contacts exterior to the feeder.

13. In a card machine, a card supply magazine, a rotary card carrier, means for feeding the cards from the magazine to the carrier, grippers on the carrier for securing the cards thereto, electrical contact devices removed from and exterior to the card carrier for controlling said feeding means, and means for operating the contact devices to stop operation of said feeding means in the absence of a card properly positioned on the card carrier.

In testimony whereof I hereunto affix my signature.

FRED M. CARROLL.