

Oct. 13, 1931.

J. R. PEIRCE

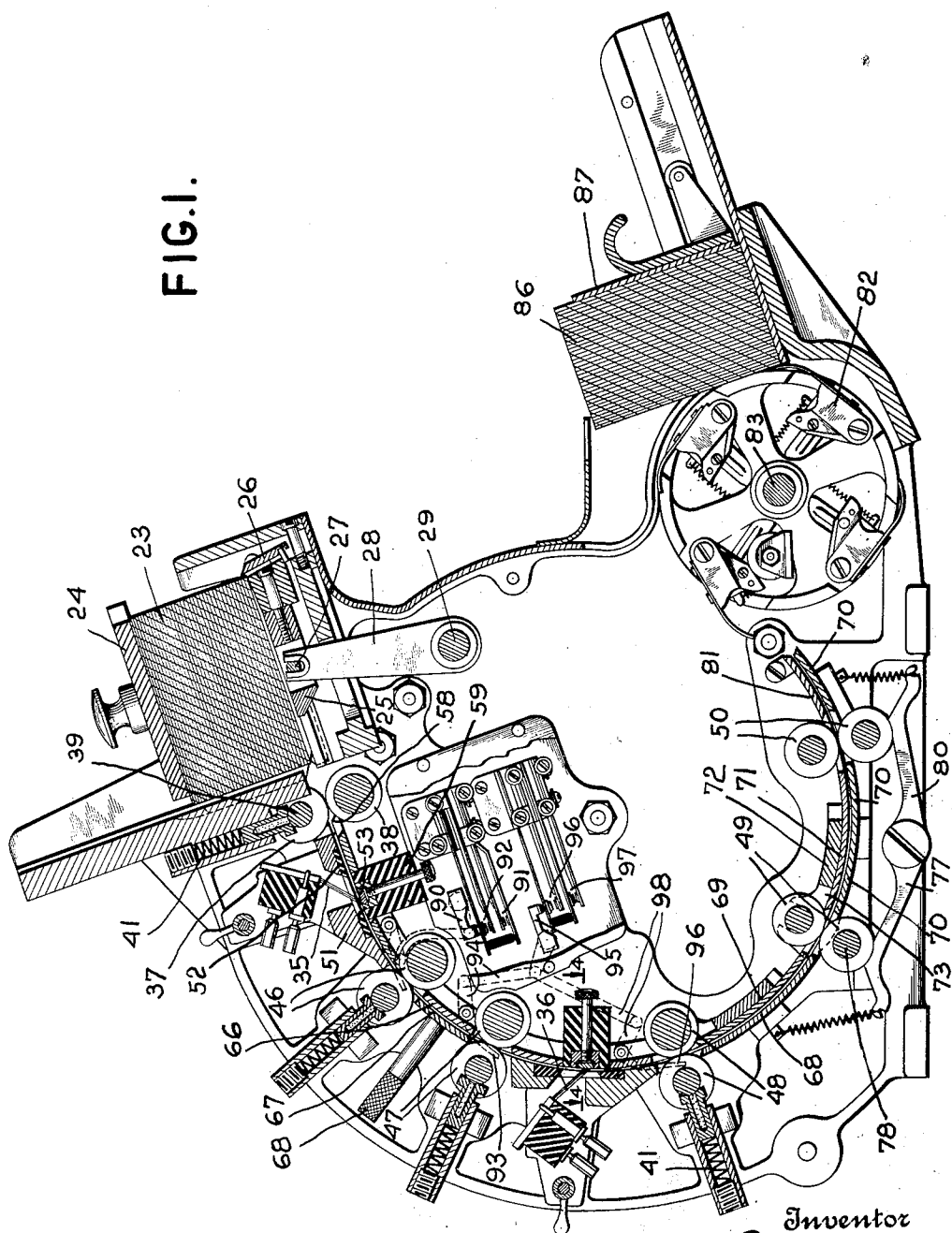
1,827,259

CARD FEEDING MECHANISM

Filed Jan. 15, 1929

4 Sheets-Sheet 1

FIG. 1.



Inventor
J. R. Peirce
By his Attorney
Wm. Wilson

Oct. 13, 1931.

J. R. PEIRCE

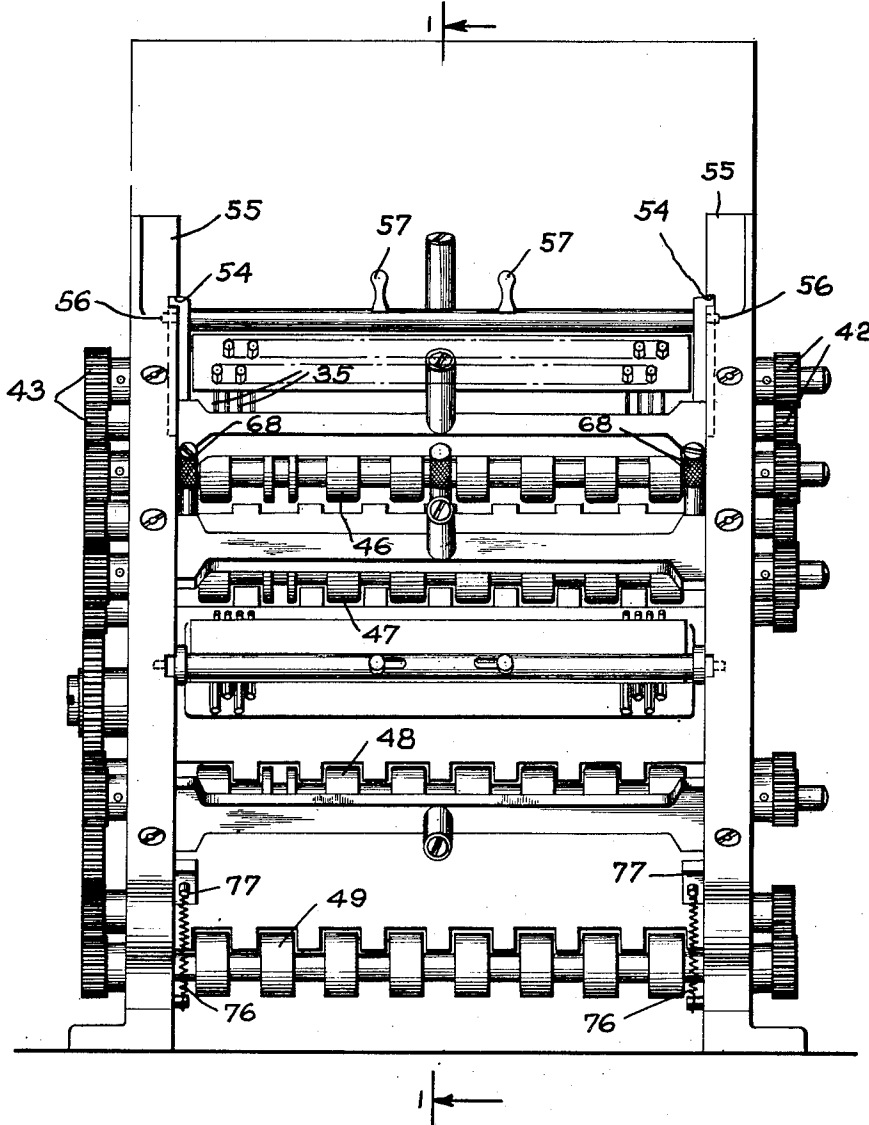
1,827,259

CARD FEEDING MECHANISM

Filed Jan. 15, 1929

4 Sheets-Sheet 2

FIG. 2.



Inventor
J. R. Peirce
By his Attorney
W. M. Wilson

Oct. 13, 1931.

J. R. PEIRCE

1,827,259

CARD FEEDING MECHANISM

Filed Jan. 15, 1929

4 Sheets-Sheet 3

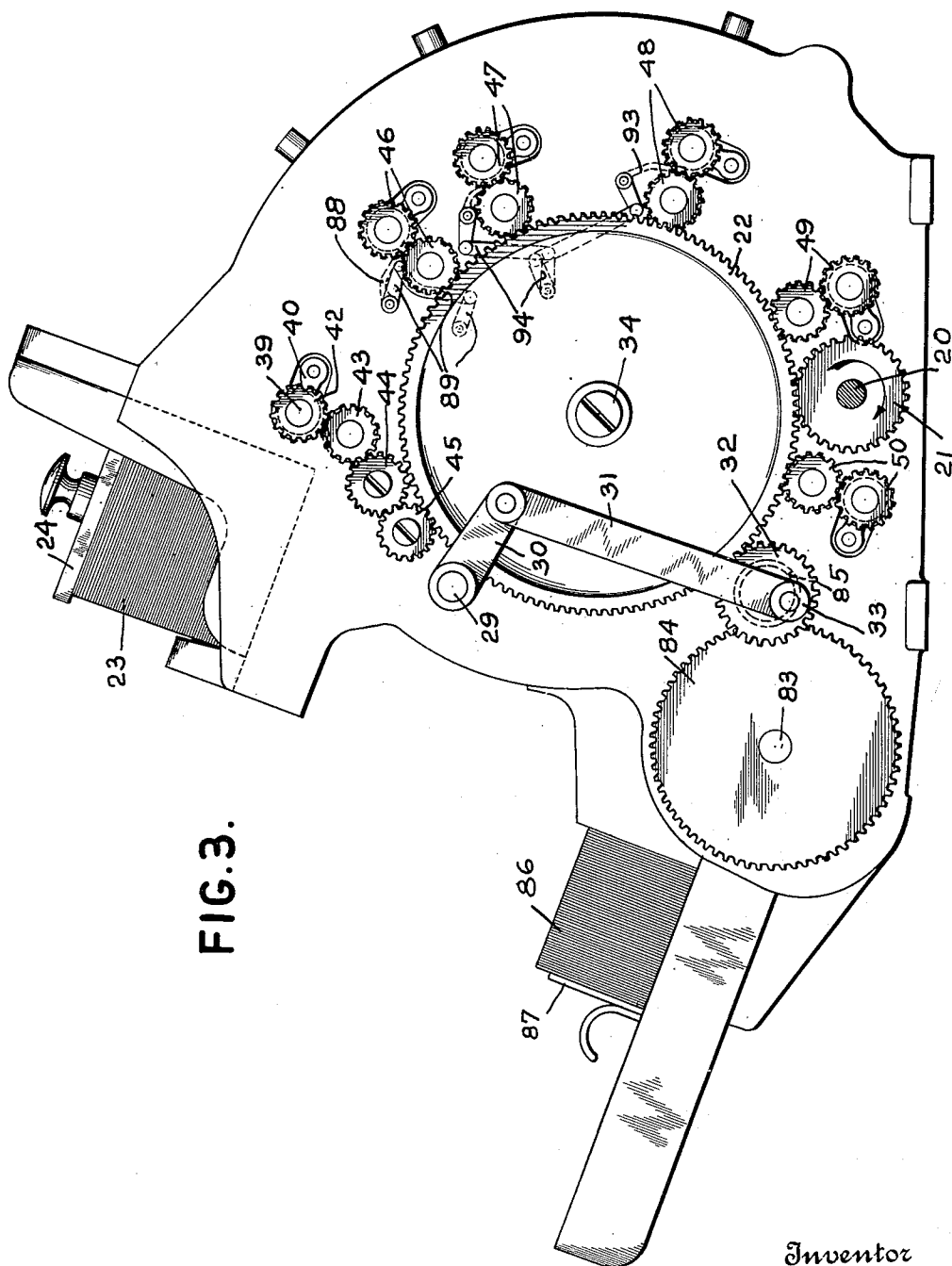


FIG. 3.

Inventor
J. R. Peirce
By his Attorney
W. M. Wilson

Oct. 13, 1931.

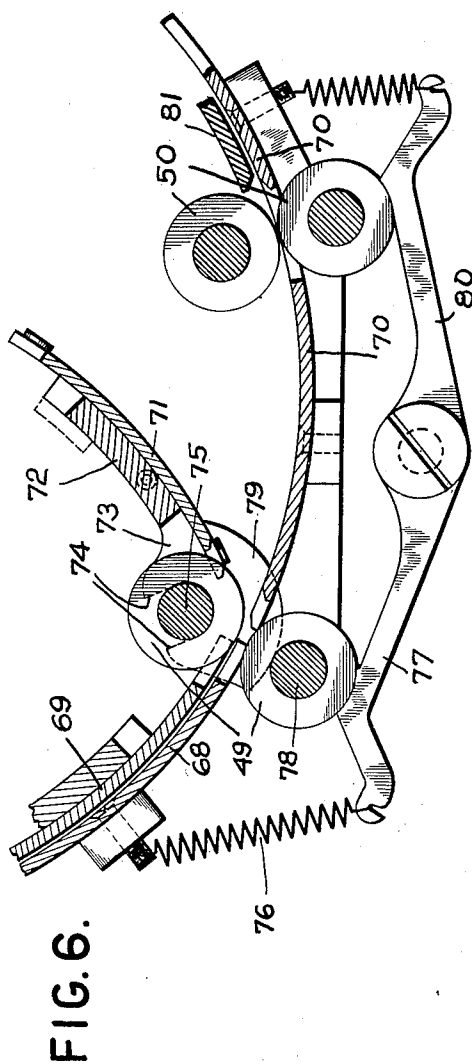
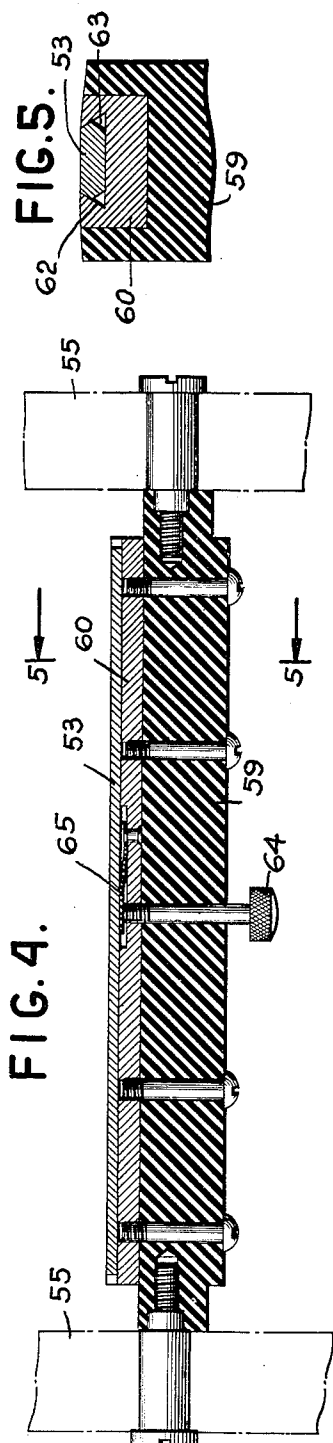
J. R. PEIRCE

1,827,259

CARD FEEDING MECHANISM

Filed Jan. 15, 1929

4 Sheets-Sheet 4



Inventor
J. R. Peirce
 By his Attorney
Wm. Wilson

UNITED STATES PATENT OFFICE

JOHN ROYDEN PEIRCE, OF NEW YORK, N. Y., ASSIGNOR, BY MESNE ASSIGNMENTS, TO
THE TABULATING MACHINE COMPANY, OF NEW YORK, N. Y., A CORPORATION OF
NEW JERSEY

CARD FEEDING MECHANISM

Application filed January 15, 1929. Serial No. 332,678.

This invention relates to tabulating, sorting machines or the like and is primarily directed to improvements in card feeding mechanisms therefor.

6 Tabulating machines are now in use which employ perforated record cards for obtaining statistical data. In deriving the data represented by the perforations in the card, the cards are fed singly from a hopper to
10 card sensing devices and thereafter to a receiving hopper. The present invention is directed to a novel structural arrangement of the card feeding mechanism which lends itself to many and important advantages to
15 be more fully set forth hereinafter.

Among the constructions and arrangements heretofore proposed, the record cards were stacked horizontally and fed in a vertical direction, and then reversed to form a vertical receiving stack while the rectilinear feed was effected by a series of gears geared to the feeding rollers. As a result of the arrangement the operator was unable to conveniently handle the cards at one position or
20 able to visually observe the number of cards in both hoppers. Due to the gearing between the sets of rollers the back lash of the gears and other mechanical imperfections did not insure the proper feeding of the cards and the proper cyclic relations were not fully
25 obtained.

In the present arrangement it is proposed to feed the cards as they leave the supply hopper in substantially a circular path to the
35 receiving hopper bringing both hoppers closely together and permitting the concentrically arranged pairs of feeding rollers to be driven by a common ring gear and the brush analyzing units to be mounted radially, rendering them easily accessible for adjustments, inspection, etc. For the purpose of enabling the cards to be removed in case of a "jam" the card tracks are in removable sections rendering every portion of the unit
40 accessible for different purposes.

With the above arrangement the operator at one position has full control over the card feeding mechanism which ordinarily is the only section requiring personal observation
45 for continuity of operation, and due to the

rapidity with which cards are analyzed this is of prime consideration. The construction proposed furthermore lends itself to simplicity in manufacture, reduced cost of maintenance, service and repair.

Other objects of the present invention reside in the improvements of certain details of construction which will be more fully set forth in the accompanying specification and claims and shown in the drawings which disclose a preferred embodiment of the invention.

In the drawings:

Fig. 1 is a cross sectional view of the improved card feeding mechanism and is taken
55 on the line 1—1 of Fig. 2.

Fig. 2 is an elevation of the card feeding mechanism looking to the right as viewed in Fig. 1.

Fig. 3 is an end view showing the driving and operating mechanism.

Fig. 4 is a longitudinal sectional view of the removable contact plate retaining device and is taken on the line 4—4 of Fig. 1.

Fig. 5 is a sectional view taken on the line 5—5 of Fig. 4.

Fig. 6 is an enlarged view of the lower portion of the card track showing the manner in which certain of the segmental track portions may be removed.

Power for driving the various mechanisms is derived from a driving shaft 20 carrying a pinion 21 meshing with a ring gear 22. The record cards are fed from a supply hopper 23 and resting upon the stack is a pressure
85 plate 24. The cards are fed singly from the hopper by the usual card picker mechanism and in the present embodiment comprises a slidably mounted reciprocable plate 25 carrying a picker knife 26 for cooperation with
90 the record cards. The plate 25 has a pin-slot connection 27 to an arm 28 secured to a shaft 29 which carries at its end a pinion 30 (Fig. 3) connected by a link 31 to a pinion 32, it being observed that the link is eccentrically
95 mounted at 33 on the pinion 32 and that the latter is in mesh with the gear 22. Each reciprocation of the arm 28 causes a card to be fed from the hopper to the analyzing mechanisms.

The record cards are diverted from their initial rectilinear movement by a track which is substantially concentric with respect to the pivot 34 of the gear 22 and the cards in passing are presented to two sets of analyzing brushes 35 and 36 which sense the perforations of the record cards. The feeding of the record cards is effected by concentrically arranged pairs of feeding rollers which frictionally grip the cards and cause them to be fed in a direction determined by the shape of the track plates. Considering the pair of feeding rollers 37, 38, the shaft 39 supporting the roller 37 is dependingly hung by arms 40 (Fig. 3) and is spring urged by spring 41 to cause engagement between the cooperating rollers 37, 38. The shafts carrying the rollers are geared together by pairs of pinions 42 and 43, one of the pinions 43 having a driving connection to gear 22 through pinions 44, 45. The remaining pairs of rollers which effect feeding of the cards comprise pairs of cooperating rollers, 46, 47, 48, 49 and 50 which are concentrically arranged with respect to the pivot 34 of gear 22.

By virtue of the above construction the driving connection from gear 22 to the rollers is direct and with the exception of the omission of pinions 44, 45 the construction and arrangement of the feeding rollers 46—50 is similar to the feeding rollers 37, 38 and the description need not be repeated. The sets of analyzing brushes 35, which are the usual group control brushes, are carried by a removable frame 51 which carries at its lower end an apertured plate 52 through which the brushes 35 extend to contact a contact plate 53. When the brush unit is inserted so that a portion of the frame extends in slots 54 (Fig. 2) in a pair of side frames 55 it is held in locked position by rods 56 spring pressed into engagement with holes in the side frames. The rods may be shifted out of engagement with the locking holes by projecting members 57 provided to facilitate removal of the brush unit.

Associated with the brush unit is a plate 58 securely fixed between side frames 55 and apertured to receive an insulating block 59 similarly held between frame members 55. (See Figs. 4 and 5.) Fitting within the block 59 is a bar 60 provided with a dove-tailed groove 62 within which fits the contact bar 53. The faces of the bar 53 are oppositely bevelled at their sides at 63 in order that they may fit within the dove-tailed groove even though reversed. By means of the above construction both faces of the contact bar may be used and different portions of each surface may be used by shifting the bar 53 lengthwise to secure a new clean metallic surface for the brushes. The bar 53 may be locked in position by a screw 64, a spring plate 65 riveted to bar 60 securing a positive electrical contact between contact bar 53 and bar 60.

It will be observed in Fig. 1 that the opposite faces of the elements coacting with the card initially are substantially straight but are curved at a point to the left of the brushes 35 thus facilitating the entry of a plane card to the brushes and gradually bending the same to conform to the curvature of the feeding track.

The structure associated with the brushes 36 is substantially identical to the unit heretofore described and between the pairs of feeding rollers 46, 47 is a pair of curved plates 66, 67 the former being fixed to the side frames 55 but the latter is removably mounted by a pair of knurled members 68 which screw into shoulders of the side frames.

Summarizing, it will be observed that in case a card becomes jammed, access thereto from the outside of the machine is secured by removal of the brush units, and the plate 67.

As the pair of rollers 49 feed the record cards they pass between pairs of curved plates 68, 69 and 70, 71 the inner plates 69, 71 preferably being movable to obtain access to the cards, feeding rollers etc. Secured to the plate 71 is a bar 72 having a pair of ears 73 forked at 74 to receive the roller supporting shaft 75. Urged by springs 76 is a pair of levers 77 which press against the lower roller supporting shaft 78 to urge the rollers 49 into cooperation with each other. When plate 71 is moved to the position shown in Fig. 6 cam edges 79 of the ears 73 depress the lower roller supporting shaft to separate the rollers 49 to permit access to or removal of a card. A somewhat similar construction is provided in connection with plate 69 with the exception that the usual spring device 41 is employed.

The rollers 50 are urged together by supplemental spring urged arms 80. When the cards are fed by rollers 50 they pass beneath a fixed curved plate 81 to any suitable stacker mechanism such as that designated by reference character 82 and which is of the rotary type, the drum shaft 83 thereof having attached thereto a gear 84 meshing with a pinion 85 secured to pinion 32. The cards are thus fed to a stack 86 one behind the other in precisely the same order they were originally. As the cards are stacked they move upwardly a pressure plate 87. In the construction shown it will be understood that a group of cards may be conveniently withdrawn and easier than if they were stacked vertically and an operator stationed in front of the machine is within easy reach of both hoppers.

If desired, the usual card levers may be positioned at the various card stations to control the card feeding mechanisms in a manner well known in the art. After a record card passes the analyzing brushes 34 it contacts a lever 88 (Fig. 3) and through a series of interconnected link members 89 rocks a contact operating lever 90 (Fig. 1) to close pairs of contacts 91 and 92. Prior to the entry of a

card to the analyzing station comprising brushes 36 it engages a card lever 93 and through interconnected links 94 rocks a lever 95 to close contacts 96 and 97. Rock lever 95 is also operated by the engagement of a record card with a card lever 96 through interconnected links 98, this action occurring when the card has passed brushes 36.

While there has been shown and described and pointed out the fundamental novel features of the invention as applied to a single modification it will be understood that various omissions and substitutions and changes in the form and details of the device illustrated and in its operation may be made by those skilled in the art without departing from the spirit of the invention. It is the intention therefore to be limited only as indicated by the scope of the following claims:

1. In a record card controlled machine, a card magazine, a stationary circumferential feeding track for guiding the record cards and means for feeding the cards from said magazine to said feeding track.

2. In a record card controlled machine, a card supply mechanism, a card delivering mechanism, a stationary circumferential track, and means to feed the record cards guided by said track from said supply mechanism to said delivering mechanism.

3. In a record controlled machine, a magazine for record cards, a card receptacle and a delivering mechanism for delivering the cards to said receptacle in a position substantially at a right angle to the position of the cards in the magazine, a relatively stationary circumferential track and means to feed the record cards guided by said track from said magazine to said delivering mechanism.

4. In a record controlled machine, a stationary circumferential feeding track for guiding record cards and means to feed cards to said track in substantially a tangential direction.

5. In a record card controlled machine, a substantially circumferential feeding track for record cards, a receptacle for the cards and means for delivering the cards from said feeding track to the receptacle in a position substantially vertical to the terminal portion of said feeding track.

6. In a record controlled machine, a substantially circumferential feeding track for record cards, a magazine for the cards and means to feed cards from said magazine to said track in substantially a tangential direction, a receptacle for the cards and means for delivering the cards from said feeding track to the receptacle in a position substantially vertical to the terminal portion of said feeding track.

7. In a record card controlled machine, a record card supply hopper, a circular track comprising a pair of plates spaced apart substantially the thickness of a record card for

determining the direction of feed of the cards from the record card supply hopper to a receiving hopper, and means comprising several pairs of feeding rollers for feeding said cards along said track.

8. In a record card controlled machine, a record card supply hopper, means comprising a circular track for determining the direction of feed of the cards from the record card supply hopper to a receiving hopper, and means comprising rollers arranged concentrically with respect to said track for feeding said cards.

9. In a record card controlled machine, a record card supply hopper, means comprising a circular track for determining the direction of feed of the cards from the record card supply hopper to a receiving hopper, and means comprising sets of rollers driven by a common ring gear for feeding said cards, said rollers being arranged concentrically with respect to said track.

10. In a record card controlled machine, a record card supply hopper, means comprising a pair of concentrically arranged sets of feeding rollers for feeding the record cards in substantially a circular path, and a rotatable driving element for driving said sets of feeding rollers in unison.

11. In a record card controlled machine, means for feeding record cards and means comprising an arcuate shaped track for determining the direction of feed of record cards, said track being sectionally removable to obtain access to record cards.

12. In a record controlled machine, means for feeding record cards from a stack, and an arcuate shaped track comprising adjacent, internal and external sections for determining the direction of card feed, said sections being sectionally removable externally and internally to obtain access to record cards.

13. In a record controlled machine, means for feeding record cards from a stack, means comprising sets of concentrically arranged feeding rollers for feeding said record cards and an arcuate shaped track concentric with respect to said feeding rollers for determining the direction of card feed, said track being sectionally removable to obtain access to record cards.

14. In a record controlled machine, means comprising sets of cooperating feeding rollers for feeding record cards, a track adapted to determine the direction of card feed, said track including sectionally movable parts and means for separating the cooperating rollers of a set when a section is moved to obtain access to a record card.

15. In a card feeding machine, a supply hopper so positioned that record cards therein gravitate to a common feeding position, a storage hopper, and a circumferential track for guiding cards for delivery into the storage hopper, said supply and storage hoppers

being positioned at terminals of the track to facilitate access thereto by an operator from a common vantage point.

In testimony whereof I hereto affix my
5 signature.

JOHN ROYDEN PEIRCE.

10

15

20

25

30

35

40

45

50

55

60

65