

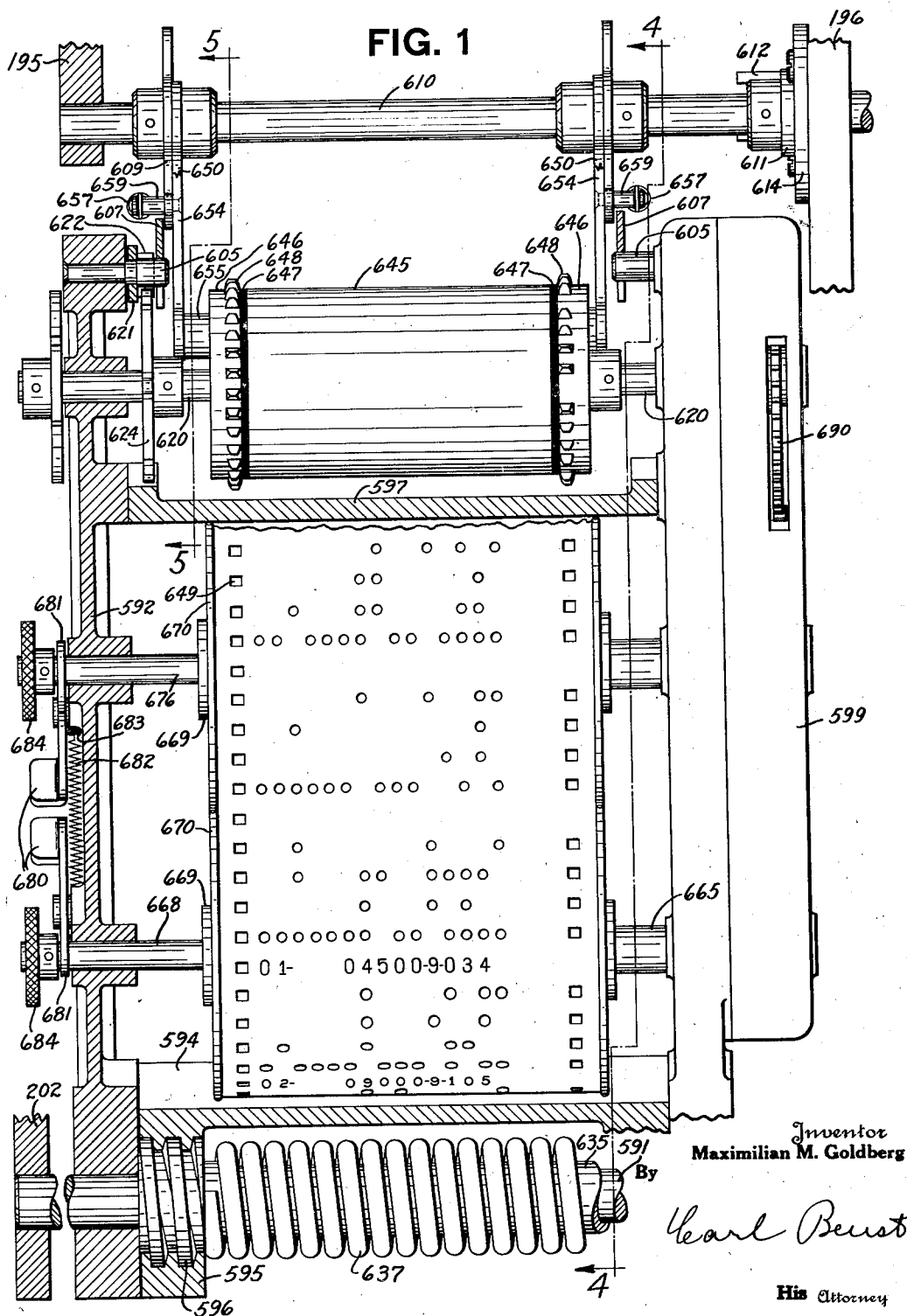
Aug. 30, 1932.

M. M. GOLDBERG

1,874,184

AUDITING MACHINE

Original Filed Sept. 27, 1926 6 Sheets-Sheet 1



Aug. 30, 1932.

M. M. GOLDBERG

1,874,184

AUDITING MACHINE

Original Filed Sept. 27, 1926 6 Sheets-Sheet 2

FIG. 2

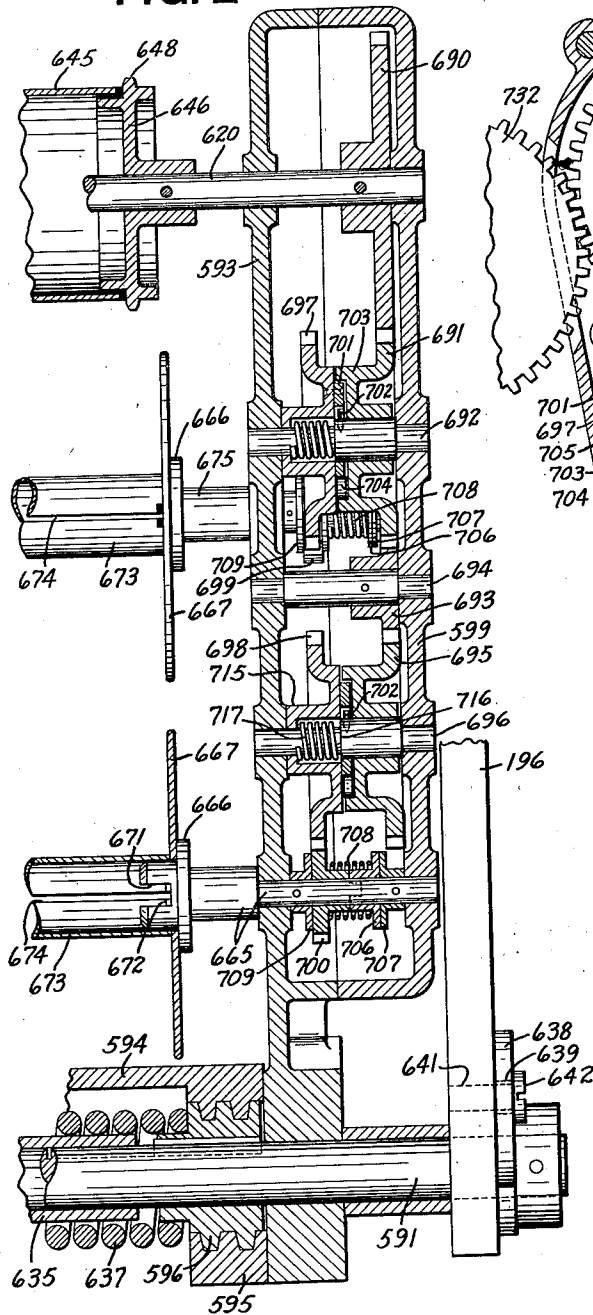
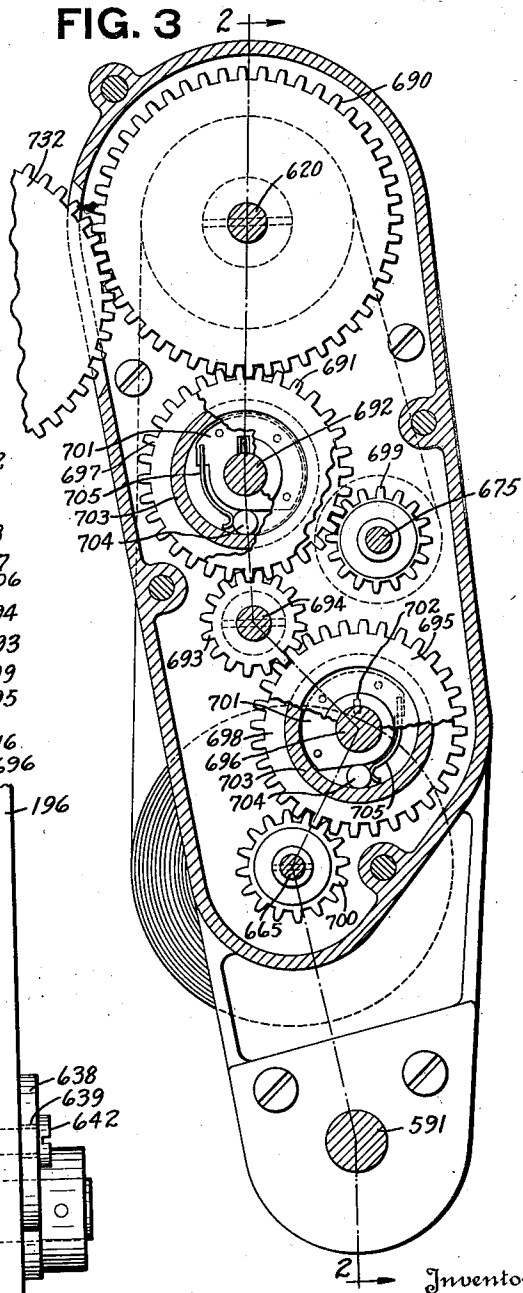


FIG. 3



2 | Inventor
Maximilian M. Goldberg
By

Heard Beust

His Attorney

Aug. 30, 1932.

M. M. GOLDBERG

1,874,184

AUDITING MACHINE

Original Filed Sept. 27, 1926 6 Sheets-Sheet 3

FIG. 4

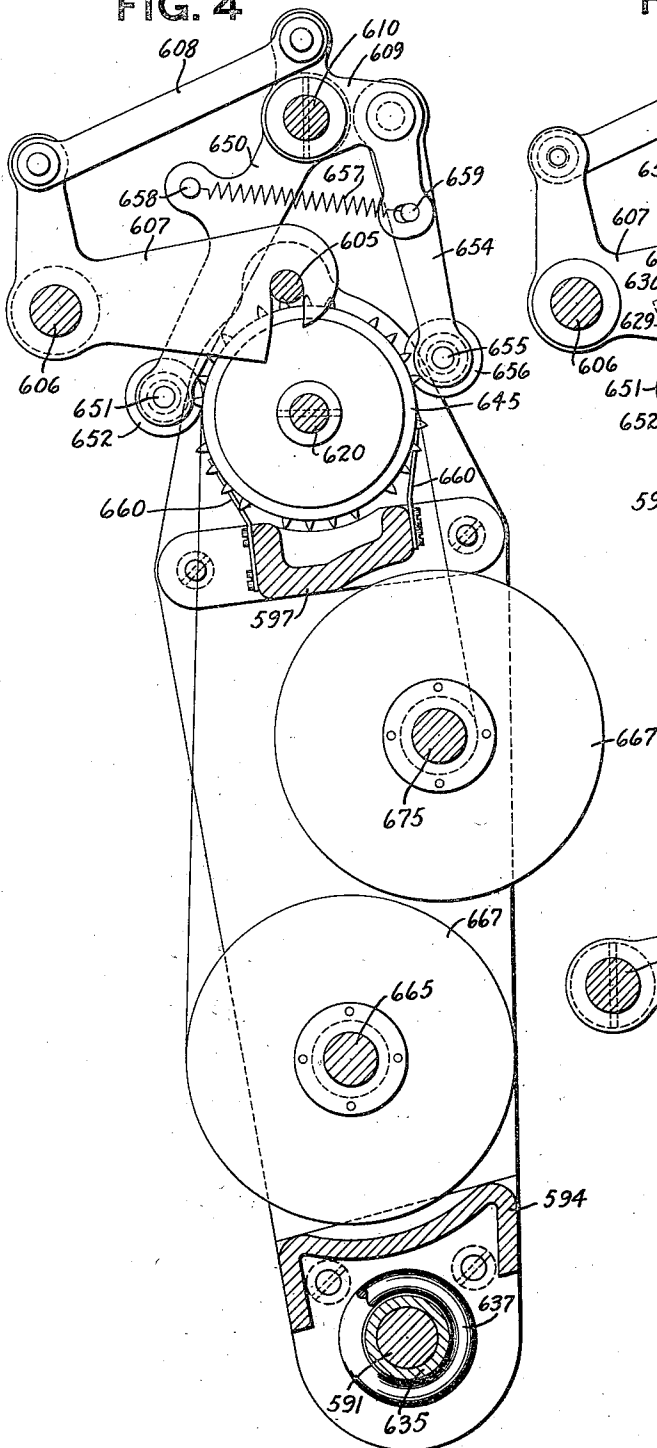


FIG. 5

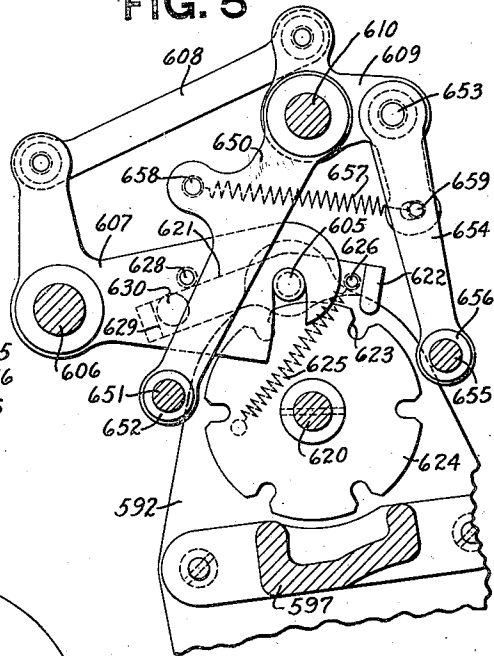
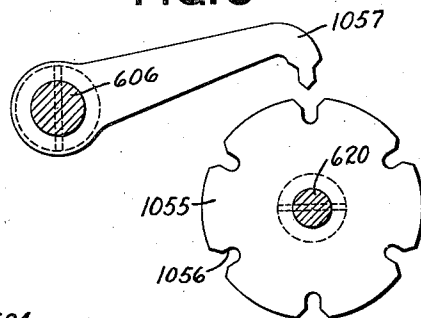


FIG. 6



Inventor
Maximilian M. Goldberg
By
Karl Benst

His Attorney

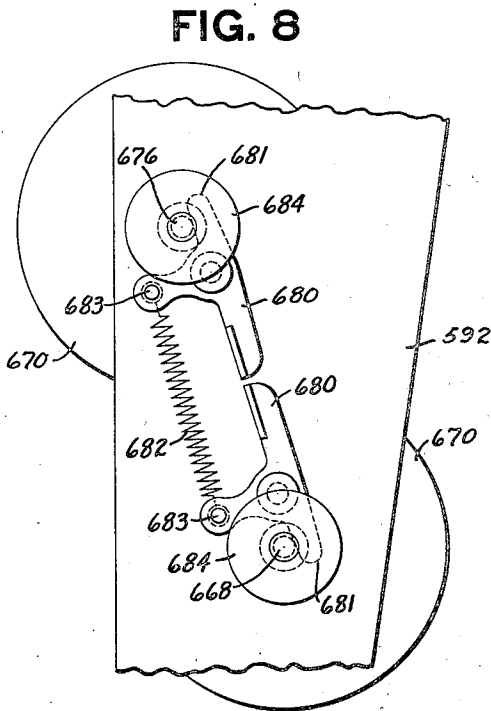
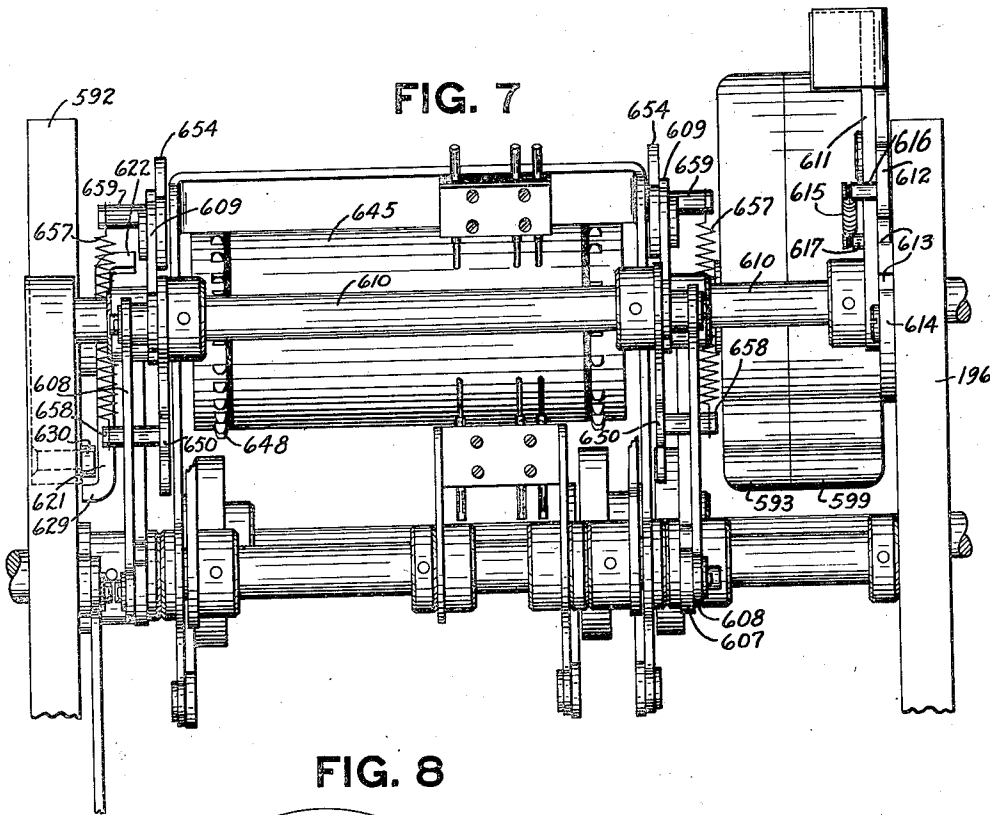
Aug. 30, 1932.

M. M. GOLDBERG

1,874,184

AUDITING MACHINE

Original Filed Sept. 27, 1926 6 Sheets-Sheet 4



Inventor
Maximilian M. Goldberg
By
Karl Rust
His Attorney

Aug. 30, 1932.

M. M. GOLDBERG

1,874,184

AUDITING MACHINE

Original Filed Sept. 27, 1926 6 Sheets-Sheet 5

FIG. 9

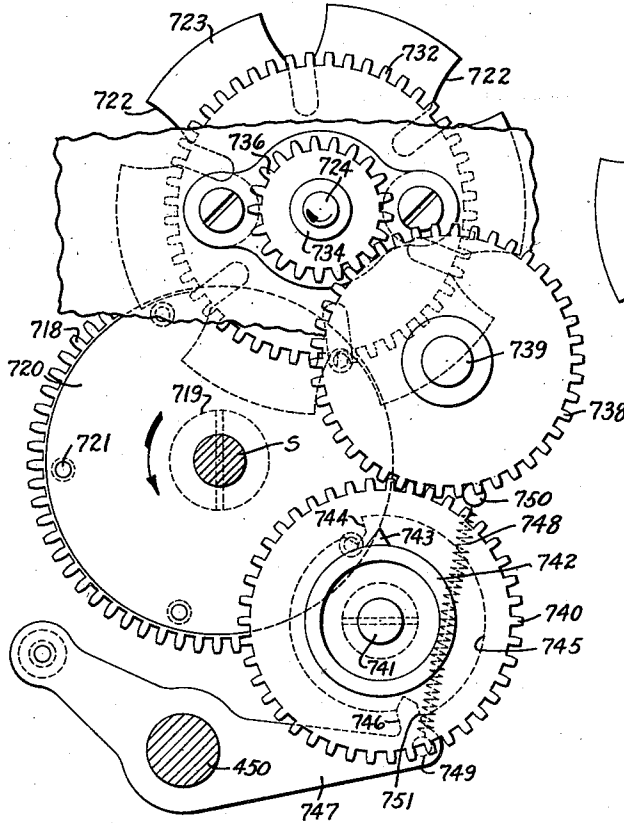


FIG. 10

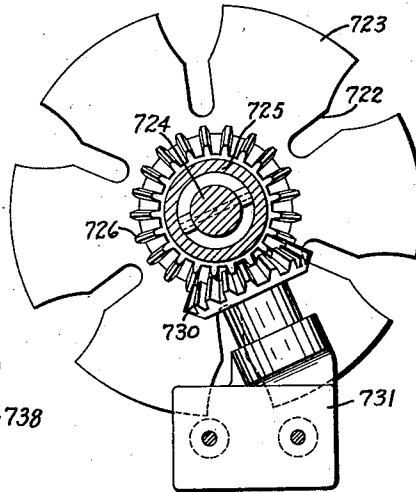
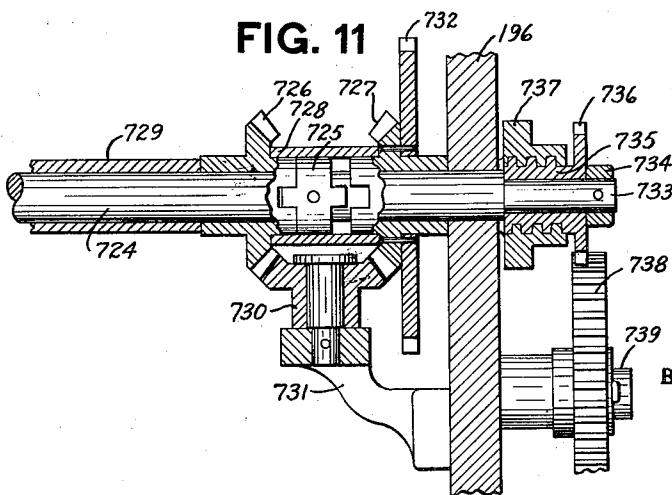


FIG. 11



Inventor
Maximilian M. Goldberg

By

Karl Benst

His Attorney

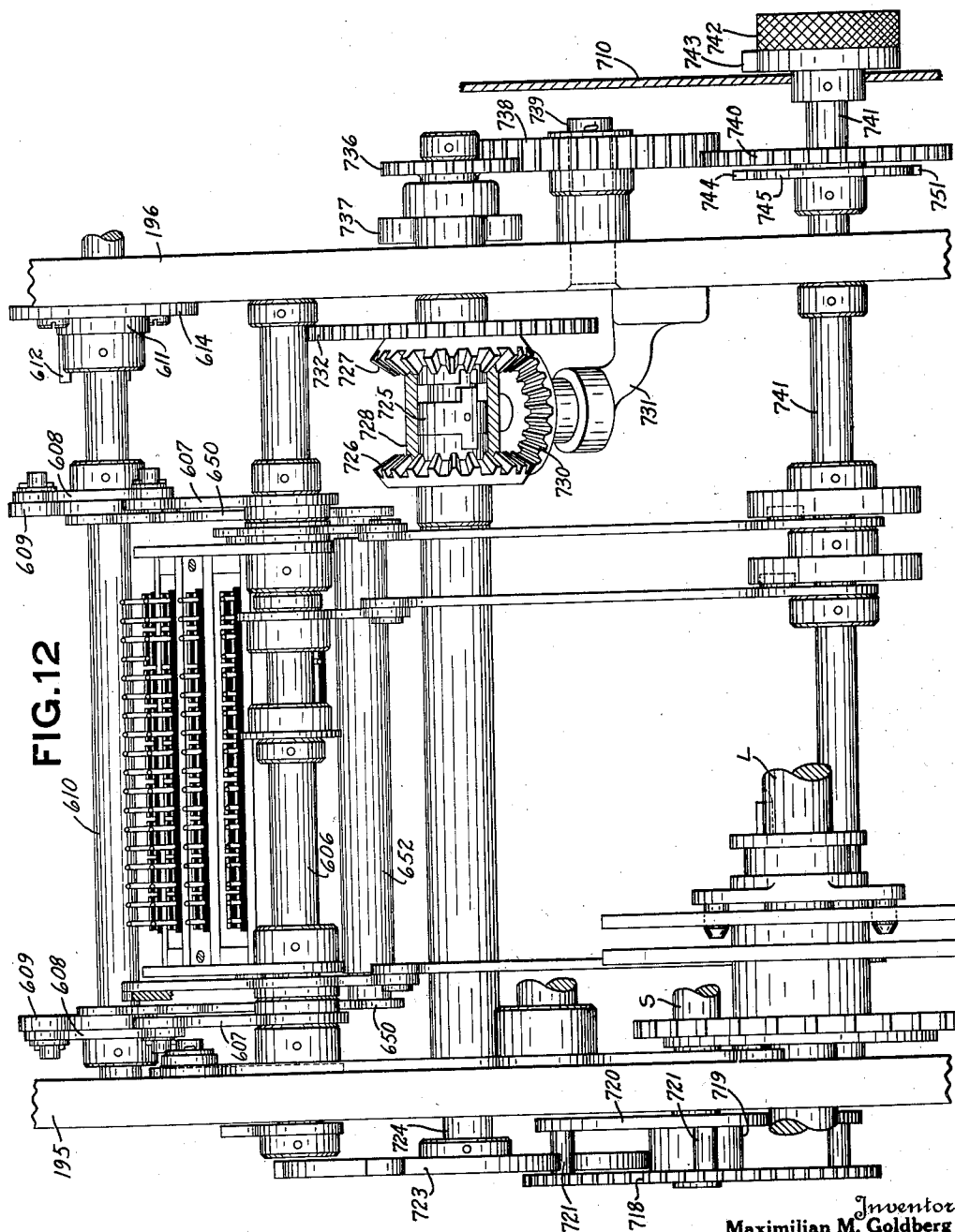
Aug. 30, 1932.

M. M. GOLDBERG

1,874,184

AUDITING MACHINE

Original Filed Sept. 27, 1926 6 Sheets-Sheet 6



Inventor
Maximilian M. Goldberg

By

Karl Benst

His Attorney

UNITED STATES PATENT OFFICE

MAXIMILIAN M. GOLDBERG, OF DAYTON, OHIO, ASSIGNOR TO THE NATIONAL CASH REGISTER COMPANY, OF DAYTON, OHIO, A CORPORATION OF MARYLAND

AUDITING MACHINE

Original application filed September 27, 1926, Serial No. 134,025. Divided and this application filed May 2, 1930. Serial No. 449,230.

This invention relates to auditing machines, and more particularly to feeding mechanisms for record strips adapted to be analyzed thereby, and constitutes a division of applicant's co-pending application, Serial No. 134,025, filed September 27, 1926, now Patent No. 1,818,473.

One object of this invention is to provide a novel means for winding the record on a spool while it is being fed.

Another object of this invention is to provide a novel mechanism whereby the record material may be fed in one direction or the reverse at the will of the operator.

A further object of this invention is to provide a novel clutch mechanism, which clutch mechanism is effective when the strip is being moved in one direction only.

A further specific object of this invention is to provide a feeding mechanism, including a spool adapted to have the record material wound thereon and unwound therefrom, in connection with a driving means having a given amount of movement for each cycle of movement for turning the spool when winding the material thereon, and also means for allowing the spool to be turned in the opposite direction when unwinding paper therefrom while allowing the driving means to operate after the record material, which has been fed by the feeding means, has been wound on said spool.

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

Of said drawings

Fig. 1 is a detail view partly in section, of the detail record carriage.

Fig. 2 is a detail view, in cross-section, taken on line 2—2 of Fig. 3, looking in the direction of the arrows, and shows the driving mechanism for the detail record carriage.

Fig. 3 is a side of the mechanism shown in Fig. 2 with the casing cut away.

Fig. 4 is a sectional view taken on line 4—4

of Fig. 1, and shows the method of holding the detail record carriage in proper alinement during analyzing operations, and the method of holding the record against the analyzing drum.

Fig. 5 is a detail taken on line 5—5 of Fig. 1.

Fig. 6 is a detail of the alining device for alining the analyzing drum during analyzing operations.

Fig. 7 is a top plan view of the detail record carriage and its cooperating mechanisms, together with the analyzer contacts for controlling the long and short cycle operations of the machine.

Fig. 8 is a detail view showing the means for detachably holding the detail record supporting mandrels on the carriage.

Fig. 9 is a detail view of the operating mechanism for feeding the detail record and the means for controlling the direction in which it will be fed.

Fig. 10 is a detail of a part of the reversing mechanism shown in Fig. 9.

Fig. 11 is a detail plan view, in section, showing the mechanism for controlling the direction of feed for the detail record.

Fig. 12 is a side elevation of the analyzer mechanisms and the means for controlling the direction of the feed of the detail record.

Generally

As has been clearly described in the parent case, Serial No. 134,025, the machine shown therein is adapted to analyze a perforated record strip containing 2,070 classifications.

That case also fully discloses a record carriage and novel mechanism, which is to be the basis of the subject matter of this divisional application, for feeding such a record strip through the machine to have those 2,070 classifications analyzed.

Due to the great number of classifications thereon, and the particular and novel method of analyzing those classifications, it is very convenient to feed that record strip in two directions, forwardly and backwardly, and in order that the operator may not be put to a great deal of unnecessary labor, and in order that much time may be saved during the analyzation of such a record strip, there is

provided a novel device whereby through the mere turning of a knob the record strip, after it has been fed in one direction to analyze the classifications by groups, may be caused to run in the reverse direction to analyze other classifications by groups.

Such a novel reversing mechanism expedites the analyzation of such a record strip, which naturally is quite long, and obviates the necessity of having to rewind the strip before it can be fed through the machine to be analyzed in another direction. In other words, applicant's novel mechanism provides for rewinding and at the same time analyzing the strip. It may not be necessary or even desirable to rewind the complete strip, and the operator may at will reverse the feed of the strip at any time he desires.

Detail record carriage

The machine, fully shown and described in the parent case, Serial No. 134,025, is provided with a carriage for feeding the detail record, which has been prepared by another machine, or a summary record which has been prepared by the present machine, through the machine. This carriage is pivoted on a shaft 591 carried by the frames 196 and 202.

The carriage is provided with two main frames 592 and 593 (Figs. 1 to 5) which are secured together by two cross members 594 and 597. The frames 592 and 593 are loosely mounted on the shaft 591. The cross member 594 has two downwardly projecting flanges 595 which are threaded to receive a short screw member 596, the purpose of which will be hereinafter described. The frames 592 and 593, together with the cross members 594 and 597, form the frame work for supporting the analyzer drum and the spools for supporting the records. The frame 593 has secured thereto an auxiliary frame 599 between which the driving mechanism for the carriage is supported.

A means is provided for latching the carriage in a position in the machine so that the analyzer contacts accurately engage the perforations in the detail record, and also to provide a means for accurately meshing a driving gear which is mounted in the carriage with a driving gear in the machine.

Mounted on each of the frames 592 and 593 (Figs. 1, 4 and 5) is a stud 605. Pivoted on a shaft 606 carried by the frames 195 and 196 are two bell cranks 607 which are notched at their right hand ends to surround the studs 605 when the carriage is in the machine. A link 608 connects each of the bell cranks 607 to an arm 609 secured to a shaft 610 carried by the frames 195 and 196. Also secured to the shaft 610 (Fig. 7) is a lever 611 having pivoted thereto a latch 612. The latch 612 is adapted to engage notches 613 cut into the periphery of a disk 614 carried by the frame 196. A spring 615 stretched between a stud

616 on the latch 612 and a stud 617 on the lever 611 normally holds the latch 612 in engagement with one of the notches 613.

When it is desired to rock the carriage 590 about its pivot 591, it is necessary to disengage the latch 612 from the notch 613, and then rotate the lever 611 so that the latch 612 will engage the foremost notch 613 (Fig. 7). This movement of the lever 611 rocks the shaft 610 counter-clockwise (Figs. 4 and 5) to rock the bell cranks 607 in a counter-clockwise direction by means of the link 608 to disengage them from the studs 605. The carriage 590 is then free to be rocked in a clockwise direction about its pivot 591 in order to permit the operator to, either remove the analyzed record from the carriage, or, to place a new record thereon in a manner to be presently described.

Analyzer drum alining device

The analyzer drum which will be hereinafter described, is mounted on a shaft 620 (Figs. 1, 4 and 5) carried by the carriage frames 592 and 593. It is desired to lock the analyzer drum against rotation when the carriage is rocked about its pivot 591 as just described. An aliner pawl 621 (Figs. 1 and 5) is provided which is pivoted on the left hand stud 605 secured on the frame 592. The pawl 621 is provided with a flange 622 which is adapted to engage a notch 623 in a disk 624 secured to the above mentioned shaft 620. There are six notches 623 provided in the disk 624. The reason for this, is that one step of movement of the detail record is equal to one-sixth of a rotation of the shaft 620. A spring 625 is stretched between a stud 626 on the pawl 621 and a stud 627 carried by the frame 592. The spring 625 normally tends to rotate the pawl 621 in a clockwise direction but is prevented from doing so by a stud 628 carried by one of the left hand bell cranks 607 (Fig. 1). However, when the bell crank 607 is rotated to disengage it from the stud 605 as above described, the stud 628 is moved away from the pawl 621 to permit the spring 625 to rock the flange 622 into one of the notches 623. When the flange 622 is in one of the notches 623 and the carriage is rocked about its pivot 591, the analyzer drum which is mounted on the shaft 620 is held against rotation.

It is desired to prevent the carriage from being rotated about its pivot 591 until the pawl 621 is entirely engaged with one of the notches 623. The pawl 621 is provided with a flange 629 near its left hand end (Figs. 5 and 7) which normally engages a stud 630 carried by the frame 195. From this it can be seen that before the carriage 590 can be rocked about its pivot, the flange 629 must be entirely free from the stud 630. When the flange 622 is entirely engaged with one

of the notches 623, the flange 629 is disengaged from the stud 630.

A means is provided for preventing the detail carriage from being acted upon by gravity, which action would give acceleration to the carriage when it is rocked about its pivot 591 (Figs. 1, 2 and 4). Surrounding the shaft 591 is a sleeve 635. The above mentioned screw members 596 are provided with short hubs 636. A powerful spring 637 surrounds the sleeve 635 and is carried by the hubs 636 of the screw members 596. The spring 637 exerts constant pressure against the screw members 596. The screw members 15 are threaded in opposite directions from each other, that is, one has right-hand threads, and the other left-hand threads. When the carriage 590 is rocked about its pivot as above described, the threaded flanges 595 20 force the screw members 596 toward each other to compress the powerful spring 637. The spring 637 is adjusted to permit the carriage, by means of its weight, to rock a certain distance, whereupon the force exerted 25 by the spring overcomes the weight of the carriage, and therefore prevents further movement thereof.

The tension of the spring 637 can be adjusted by means of a member 638 (Fig. 1) 30 which is pinned to the shaft 591. The member 638 is provided with five holes 639, only one of which is shown. The frame 196 is provided with a tapped hole 641 adapted to receive a screw 642 which projects through 35 one of the holes 639. If the spring 637 is not properly tensioned, it can be adjusted by rocking the member 638 either up or down to register one of the holes 639 with the tapped hole 641 and inserting the screw 642 therein 40 to hold the member 638 in its adjusted position. This movement of the shaft causes the screw members to be moved either toward or away from each other, thereby regulating the tension of the spring.

Analyzer drum

As above mentioned, the shaft 620 has secured thereto an analyzer drum 645 (Figs. 1, 2, 4 and 7). The drum 645 is provided with 50 two flanges 646 which are pinned to the shaft 620. The drum 645 is insulated from the flanges 646 by circular bands of insulation 647. The flanges 646 are provided with spurs 648 which are adapted to engage square holes 649 (Fig. 1) in the record strips. It will be noticed that the holes 649 on the left-hand side of the strips are equally spaced, and the holes on the right-hand side have every fifth 55 perforation omitted. The flanges 646 of the drum 645 are provided with spurs 648 equally spaced on the left-hand side, and with every fifth spur omitted on the right-hand side. The object of spacing the holes in the record 60 and the spurs on the drum in this manner,

is to make it necessary to correctly place the record on the carriage.

Detail paper tension roll

It is desired to hold the record strip tightly 70 against the drum as it is being fed through the machine to be analyzed. Loosely mounted on the shaft 610 are two arms 650 (Figs. 4, 5 and 7), which carry a shaft 651 upon which is mounted a roller 652. Pivoted to a stud 75 653 on each of the above mentioned arms 609, is an arm 654 which carries a shaft 655 upon which is mounted a roller 656. A spring 657 is stretched between a stud 658 carried by the arm 650 and a stud 659 carried by the 80 arm 654 and normally draws the arms 650 and 654 toward each other. The drum 645 over which the detail record is fed lies in the path of the two rollers 652 and 656, and therefore the spring 657 holds them tightly 85 against the drum 645.

When it is desired to rock the carriage about its pivot to change the record it is necessary to rock the roller 656 out of the path of the drum 645. It will be remembered 90 that a means is provided for rocking the shaft 610 to disengage the bell crank 607 from the stud 605 to unlock the carriage 590. When the shaft 610 is rocked, the arm 609 by means of the stud 659, rocks the arm 654 in a counter- 95 clockwise direction about the shaft 610 to permit the carriage to be rocked from the machine.

It will be noticed that the slots through which the stud 659 projects is elongated. This elongation is to permit relative motion between arm 609 and the arm 654, and also to permit the spring 657 to hold the roller 656 tightly against the drum 645, as above described. 105

Four plates, two of which are shown at 660 (Fig. 4), are held against the drum 645 and act as strippers to loosen the record from the analyzer drum. This is necessary because 110 since the rollers 652 and 656 cause the record to be tightly held against the drum, it has a tendency to adhere to the drum and be wound thereon.

Detail paper spools

The carriage is provided with two spools 115 which are adapted to be rotated in either direction. The detail record may be placed on either of these spools. The feeding mechanism is controlled in a manner to be herein- 120 after described, so that the record may be fed onto the other spool. The spools are mounted in the carriage in such a manner that they may be removed from the carriage 125 for the purpose of placing the detail record thereon.

Formed on a short shaft 665 (Figs. 1, 2 and 3) carried by the frames 593 and 599 of the carriage, is a hub 666 to which is fast a 130

flange 667. Formed on a shaft 668 slidably mounted in the frame 592 of the carriage is hub 669 having secured thereto a flange 670. Each of the hubs 666 and 669 is provided with notches 671 (Fig. 2) into which flanges 672 of a tube 673 project. The tube 673 is provided with a slot 674 extending its full length to provide a means for attaching the end of the detail record. The end of the detail record is inserted into the slot and then it is given a few turns around the cylinder in a well known manner.

Also carried in the frames 593 and 594 of the carriage is a short shaft 675 which is identical in construction with the shaft 665. Also slidably mounted in the frame 592 is a short shaft 676 (Fig. 1) which is identical with the shaft 668. The shafts 675 and 676 are provided with hubs 666 and 669 identical with those above described for shafts 665 and 668. A tube 673 is supported by the shafts 675 and 676 in identically the same manner as the shafts 665 and 668 support the first mentioned tube 673.

The shafts 668 and 676 are slidably mounted in the frame 592 but are held in their positions by pivoted members 680 (Figs. 1 and 8). The shafts 668 and 676 are notched to permit projections 681 of the pivoted members to engage therewith. The projections 681 are held in engagement with the notches by a spring 682 stretched between studs 683 on the pivoted members.

In order to remove one of the tubes 673 for the purpose of either removing or placing a record thereon, it is necessary to rock one of the members 680 to disengage the projection 681 from the notch in the shaft 668. Each of the shafts 668 and 676 is provided with a knob 684 to permit manual rotation of the shafts or to permit the shafts to be moved laterally in their bearings in the frame 592 to disengage the hubs 669 from the flanges 672 of the tubes 673, thereby permitting the operator to remove the tube from the carriage.

Feeding mechanism

As previously stated the record is adapted to be fed in either direction. The object is to provide a simple means of feeding the record repeatedly through the machine for analyzing without the necessity of taking the record out of the carriage and replacing it on the original spool from which it has been fed. In the present machine this is particularly desirable, because only certain transactions of the record are analyzed each time the record is sent through the machine. When the machine is adjusted to select certain transactions, the feeding mechanism is controlled, whereby it feeds all other transactions past the analyzer without stopping. The means for thus controlling the movement of the record will be hereinafter described.

Secured to the shaft 620 is a gear 690 (Figs. 1, 2 and 3) which is adapted to be rotated by mechanism to be presently described. The gear 690 meshes with a gear 691, loosely mounted on a shaft 692. The gear 691 meshes with a pinion 693 secured to a shaft 694 carried by the frames 593 and 599. The pinion 693 meshes with a gear 695 loosely mounted on a shaft 696 journaled in the frames 593 and 599. Also loosely mounted on the shaft 692 is a gear 697 which is adapted to be driven by the gear 691 by means of a clutch to be presently described, when being rotated in one direction. The gear 695 is adapted to drive a gear 698, which is loosely mounted on the shaft 696 by a clutch mechanism, in one direction. The gear 697 meshes with a pinion 699 loosely mounted on the shaft 675 and the gear 698 meshes with a pinion 700 loosely mounted on the shaft 665.

Assuming that the detail record has been placed on the lowermost spool, carried by the shaft 665, as shown in Figs. 1 and 3, and is being fed onto the upper spool carried by the shaft 675, the gear 690 is rotated in a clockwise direction (Fig. 3). Clockwise movement of the gear 690 rotates the gear 691 in a counter-clockwise direction. Secured to the gear 697 is a clutch member 701 which is secured to the shaft 692 by means of a pin 702. The gear 691 is provided with a circular flange 703 into which the clutch member 701 projects. A roller 704 is loosely positioned between the flange 703 and the clutch member 701, and is held in this position by a flat spring 705 mounted on the clutch member 701. The clutch member 701 is so shaped that when the gear 691 is rotated in a counter-clockwise direction, the roller 704 is wedged between the flange 703 and the clutch member 701, and it thereby rotates the gear 697 in a counter-clockwise direction. Counter-clockwise rotation of the gear 697 rotates the pinion 699 in a clockwise direction. The pinion 699 is clutched to a friction plate 706 which is held against another friction plate 707 by means of a spring 708. The spring 708 holds the pinion 699 against another friction plate 709. The friction plates 707 and 709 are both secured to the shaft 675. When the pinion 699 is rotated in a clockwise direction, as above mentioned, the shaft 675 is carried therewith by means of the friction plates 707 and 709.

When the gear 691 is being rotated in a counter-clockwise direction, as just described, the pinion 693 is rotated clockwise and thereby rotates the gear 695 counter-clockwise. The gear 695 is provided with a flange 703, as above described for the gear 691. Secured to the gear 698 is a clutch member 701. Disposed between the flange 703 and the clutch member 701 of the gears 695 and 698 is a roller 704 which is held in position by a spring

705. The gear 698 and the clutch member 701 are rotated with the shaft 696 by means of a pin 702. It will be noticed by referring to Fig. 3, that both clutch members 701 are identical in construction, the only difference being that they are arranged to drive their respective gears in opposite directions. When the gear 695 is being rotated counter-clockwise, the flange 703 on the gear 695 tends to rotate the roller 704 away from the clutch member 701, and therefore the gear 695 rotates independent of the gear 698. However, when the direction of rotation of the gear 690 is reversed to feed the detail record in the opposite direction from that above described, the gear 695 is rotated in a clockwise direction, and therefore, by means of the roller 704, the clutch member 701 rotates the pinion 700 in a counter-clockwise direction. The shaft 665 also has friction plates 706, 707 and 709 mounted thereon, and a spring 708 for holding the plates 706 and the pinion 700 against the friction plates 707 and 709, as above described.

From the above description it can be seen that no matter in what direction the gear 690 is rotated, the clutch members adapt themselves to drive their respective pinions to feed the record material in either direction; that is, if the gear 690 is being rotated in a clockwise direction, the upper clutch member on the shaft 692 rotates the shaft 675 in a clockwise direction to feed the record on the spool which is connected to this shaft. When the gear 690 is rotated in a counter-clockwise direction, the lower clutch member 701 rotates the shaft 696 to drive the pinion 700 in a counter-clockwise direction to feed the record material on the spool that is connected to the shaft at 665.

The object of providing the shafts 665 and 675 with friction drive as above described, is to provide a means for taking care of the variable amount of feed required for feeding the record on the spool as the diameter of the record on the spool increases. The amount of movement of the gear 690 for feeding the record material for one transaction is fixed, but the angular rotation of the shafts 665 and 675 varies with the diameter of the paper on the spool. When the spool, as illustrated herein, is completely filled, the angular movement of the shaft 675 necessary to take up the amount of feed required for one transaction is 42°. When the spool is emptied the angular movement required is 180°. The ratio of the gears 690 and 691 and pinion 699 is such that one step of movement of the gear 690 rotates the pinion 699, 180°. It can, therefore, be seen that the pinion 699 has a fixed angular movement for each transaction, whereas the angular movement of the roll itself will vary from 42° to 180°, and therefore, a maximum slippage of 138° is required.

When the record is being wound upon the

spool 675, it is being unwound from the spool on the shaft 665, and vice versa. The unwinding of the paper from the spool is accomplished by the drum 645 and the spurs 648 thereon. It can therefore be seen that when the paper is being fed by the drum, it is being pulled from one of the spools. In order to prevent the paper from unwinding too rapidly, a means is provided whereby a braking effect is applied on the spool that is being unwound. It will be remembered that the pinion 700 for the shaft 665 meshes with the gear 698. The gear 698 has a hollow hub 715 (Fig. 2). The shaft 696 has a shoulder 716 against which a spring 717 exerts pressure. The other end of the spring 717 exerts pressure against the inside of the hollow hub 715 of the gear 698. From this it can be seen that friction is set up between the right-hand end of the shaft 696 and the frame 599 of the record carriage, and between the hub 715 of the gear 698 and the frame 593 of the record carriage. The friction set up by the spring 717 is sufficient to prevent the record from unwinding from the spool too rapidly.

The shaft 692 for the upper spool is provided with a similar spring 717 which sets up friction to act as a brake for the upper spool when the record is being unwound from that spool.

Detail record feed control

As before mentioned, a mechanism is provided for controlling the direction in which the detail record is to be fed. Secured to the shaft "S", which shaft is described in the parent case, Serial No. 134,025, as the "short cycle" shaft, is a gear 718 (Figs. 9 and 12) which is mounted on a hub 719 together with a disk 720. Mounted between the gear 718 and the disk 720 are five studs 721 which are adapted to engage notches 722 on a Geneva plate 723 secured to a shaft 724. Also secured to the shaft 724 is a clutch member 725 (Figs. 10, 11 and 12). Loosely mounted on the shaft 724 are two beveled gears 726 and 727 which are spaced from each other by a sleeve 728 and upon the shaft by a sleeve 729. Disposed between the beveled gears 726 and 727, and meshing therewith, is a beveled pinion 730 carried by a bracket 731 mounted on the side frame 196. Secured to the beveled gear 727 is a gear 732 in mesh with the above mentioned gear 690, when the record carriage is rocked into position for having the record analyzed.

With the clutch member 725 in the position shown in Fig. 11, the shaft 724 receives a clockwise rotation (Fig. 9) by means of the shaft "S", the studs 721 and the Geneva plate 723 secured thereto. The clutch drives the beveled gear 726 in a clockwise direction, and by means of the beveled pinion 730 rotates the beveled gear 727 and gear 732 in a counter-

clockwise direction to rotate the gear 690 in the record carriage in a clockwise direction, as above described.

A means is provided for reversing the direction of rotation of the gear 732 and thereby reversing the rotation of the gear 690. The shaft 724 has a reduced portion 733 (Fig. 11) at its right-hand end, and has a screw member 735 loosely mounted thereon. The member 735 has a pinion 736 made integral therewith, both of which are held against lateral movement on the shaft 724 by means of a collar 734 secured to the shaft and the shoulder formed by the portion 733. Secured to the frame 196 is a bracket 737 which is threaded to receive the screw member 735. Meshing with the pinion 736 is a wide gear 738 mounted on a short stud 739 carried by the frame 196. The gear 738 is made wider than the pinion 736 to permit the pinion and the shaft 724 to be shifted laterally in a manner to be hereinafter described. Meshing with the gear 738 is a gear 740 (Figs. 10 and 12) which is secured to a shaft 741 carried by the frames 195 and 196. Secured to the shaft 741 is a knob 742 which projects through the cabinet 710 of the machine. The knob 742 is provided with a pointer 743 to enable the operator to determine in what position the knob is set.

When it is desired to reverse the direction of feed of the detail record, the operator must turn the knob 742 counter-clockwise, 180° (Fig. 9), until a shoulder 744 on a disk 745 secured to the shaft 741, engages a stop 746 on an arm 747 pivoted on the shaft 450. The stop 746 is held in the path of the shoulder 744 by means of a spring 748 stretched between a stud 749 on the arm 747 and a stud 750 carried by the frame 196.

When the knob is turned in a counter-clockwise direction, as just mentioned, the gear 740 rotates the gear 738 clockwise, which rotates the pinion 736 in a counter-clockwise direction. The pinion 736 thereupon is moved to the right (Fig. 11) by the screw member 735 and the threaded bracket 736 to shift the shaft 724 toward the right. This shifting movement of the shaft 724 disengages the clutch member 725 from the beveled gear 726 and engages it with the beveled gear 727. The studs 721 located between the gear 718 and the plate 720, are long enough to permit the Geneva plate 723 to shift with the shaft. With the clutch member 725 engaging the beveled gear 727 and the shaft 724 given a clockwise rotation as above mentioned, the beveled gear 727 and the gear 732 are rotated clockwise. This rotates the gear 690 in the paper carriage in a counter-clockwise direction, which is the reverse of that above described.

If it is desired to again reverse the direction of the feed, the operator must turn the knob 732 in a clockwise direction until a shoulder

751 engages a stop 746 in the arm 747. This brings the mechanism back to the position shown in Fig. 9.

In order that the perforations on the record strip will always be in proper alinement for analyzation, the shaft 620 (Fig. 6) to which the analyzer drum 645 is secured, carries a disk 1055 provided with notches 1056. Once during each analyzing cycle of operation an aliner arm 1050 secured to the shaft 606 is adapted to engage one of the notches 1056 to properly aline the perforations when the analyzer contacts shown in the upper part of Fig. 12 are brought into contact with the record sheet to analyze the same.

While the form of mechanism herein shown and described is admirably adapted to fulfill the objects primarily stated, it is to be understood that it is not intended to confine the invention to the one form or 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 as new, is:

1. In a machine of the class described, the combination of feeding means for feeding record material a given amount for each cycle of operation, a spool adapted to have record material wound thereon or unwound therefrom, driving means having a given amount of movement for each cycle of movement for turning said spool when winding material thereon, a friction drive between said driving means and spool to allow the driving means to operate after record material which has been fed by the feeding means has been wound on said spool, and another friction means to prevent said driving means from turning said spool when record material is being unwound therefrom by said feeding means.

2. In a machine of the class described, the combination of feeding means for feeding record material a given amount for each cycle of operation, a spool adapted to have record material wound thereon or unwound therefrom, driving means having a given amount of movement for each cycle of movement for turning said spool when winding material thereon, a friction drive between said driving means and spool to allow the driving means to operate after record material which has been fed by the feeding means has been wound on said spool, and means for preventing said driving means from turning said spool when record material is being unwound therefrom by said feeding means.

3. In a machine of the class described, the combination of means for feeding record material a given amount for each cycle of operation, spools adapted to have record material wound thereon and therefrom, a common driving means for said spools adapted to

drive said spools in either direction, and means for clutching said driving means to said spools for winding the record thereon, one element of said clutching means acting
5 as a brake for said spools when unwinding the record material therefrom.

In testimony whereof I affix my signature.

MAXIMILIAN M. GOLDBERG.

10

15

20

25

30

35

40

45

50

55

60