

Nov. 26, 1935.

L. H. MORSE

2,021,894

DEVICE FOR ATTACHING PRINTING MEMBERS ON DRUMS

Filed Nov. 24, 1934

2 Sheets-Sheet 1

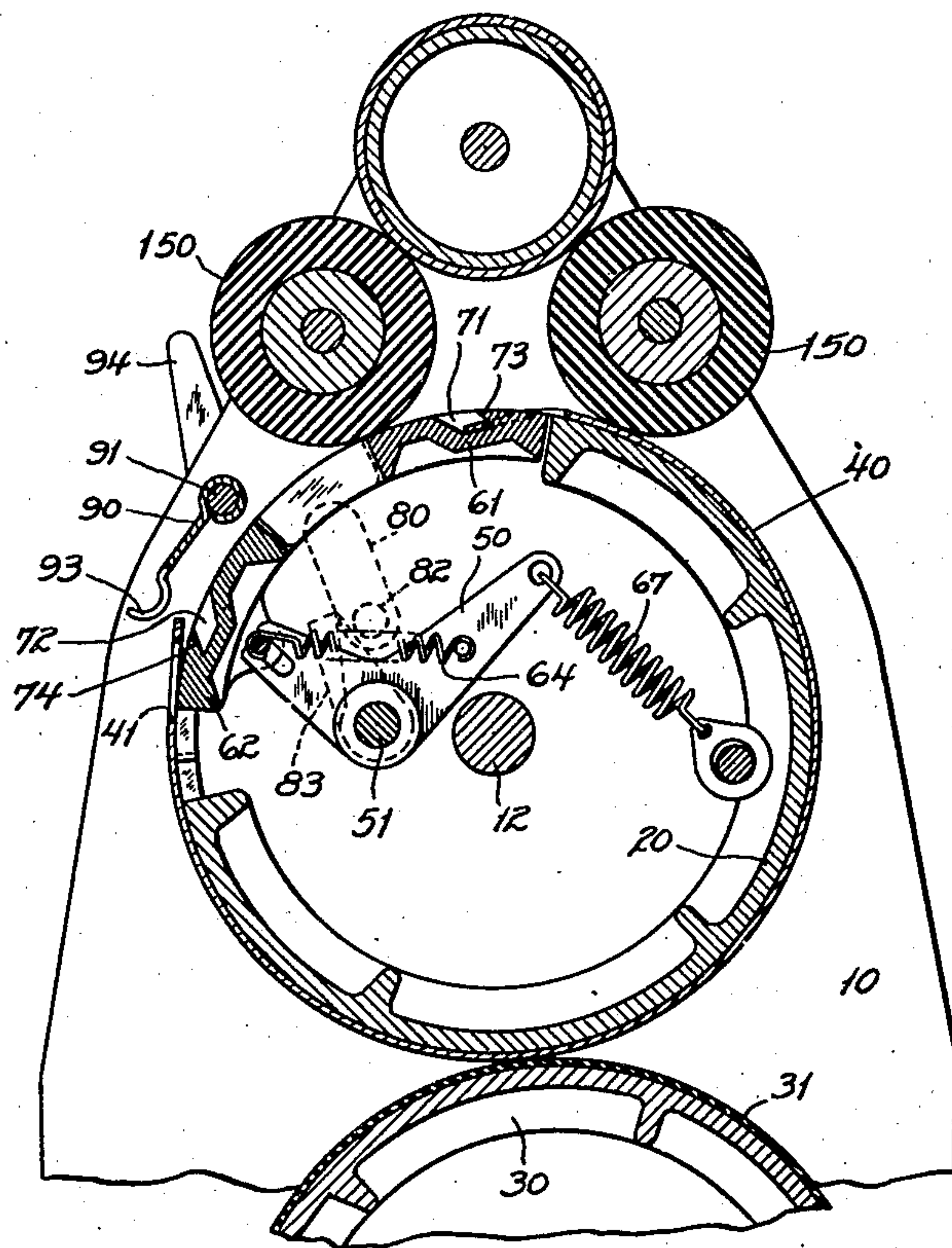


Fig. 2

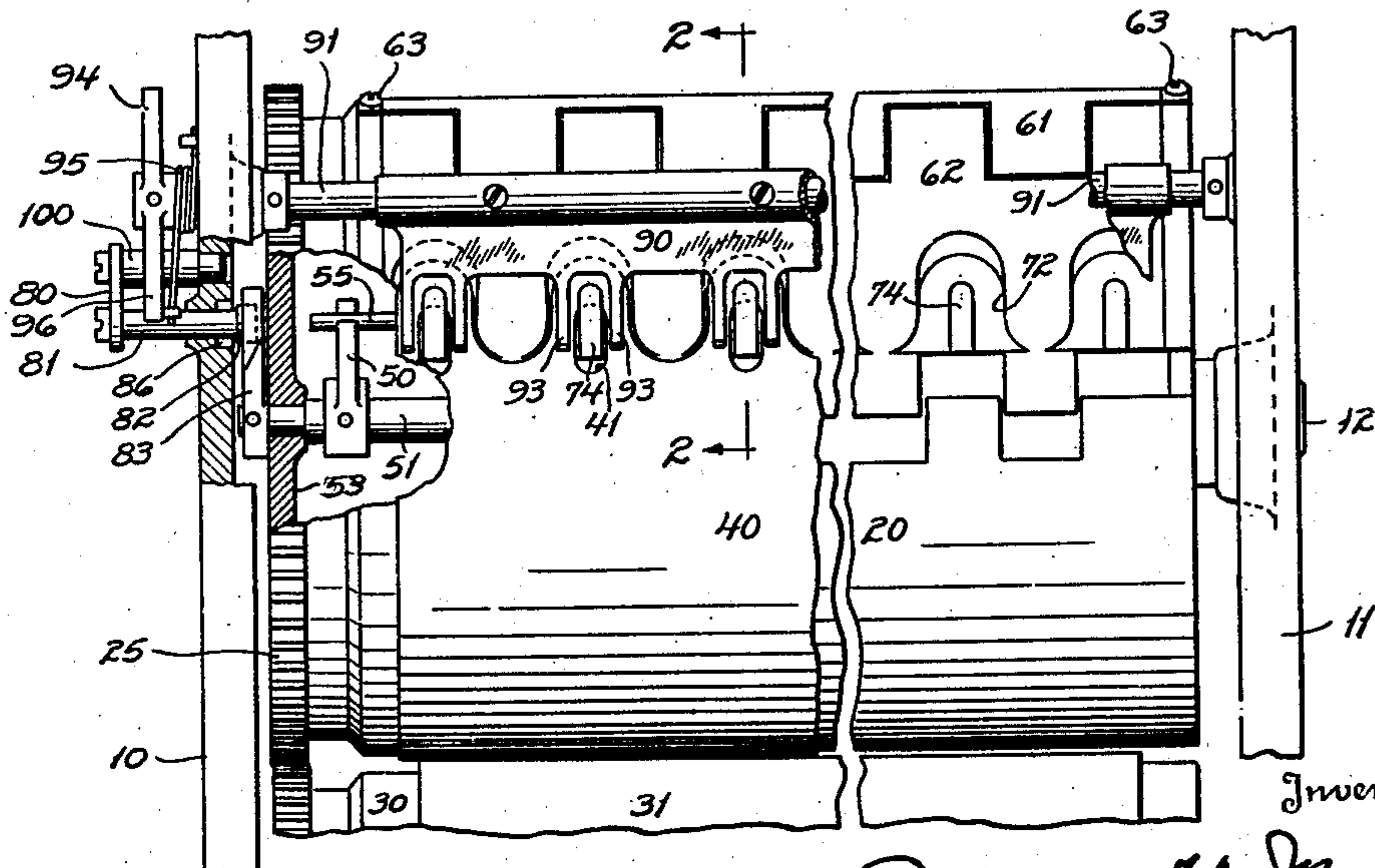


Fig. 1

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2 Sheets-Sheet 2

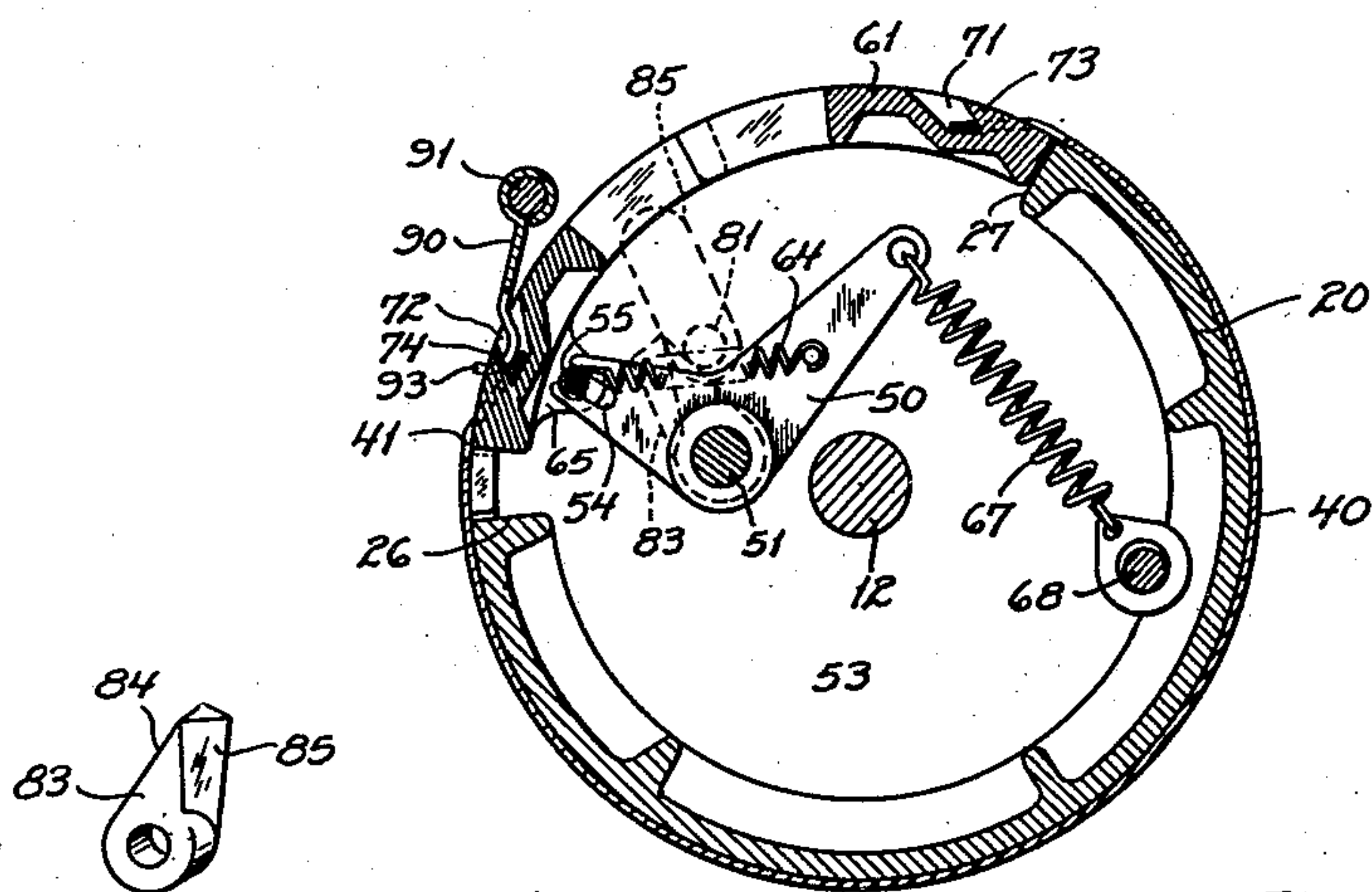


FIG. 3

FIG. 6

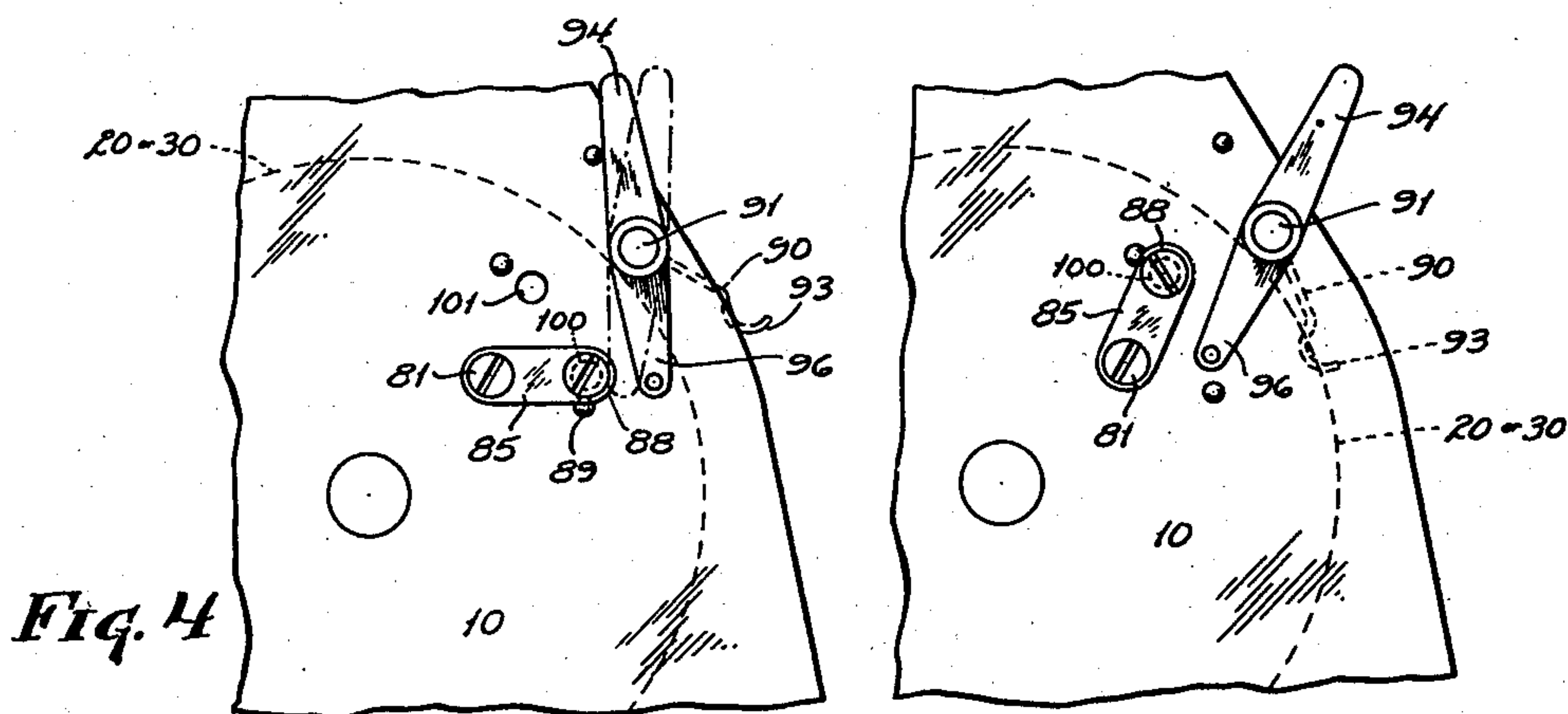


FIG. 4

FIG. 5

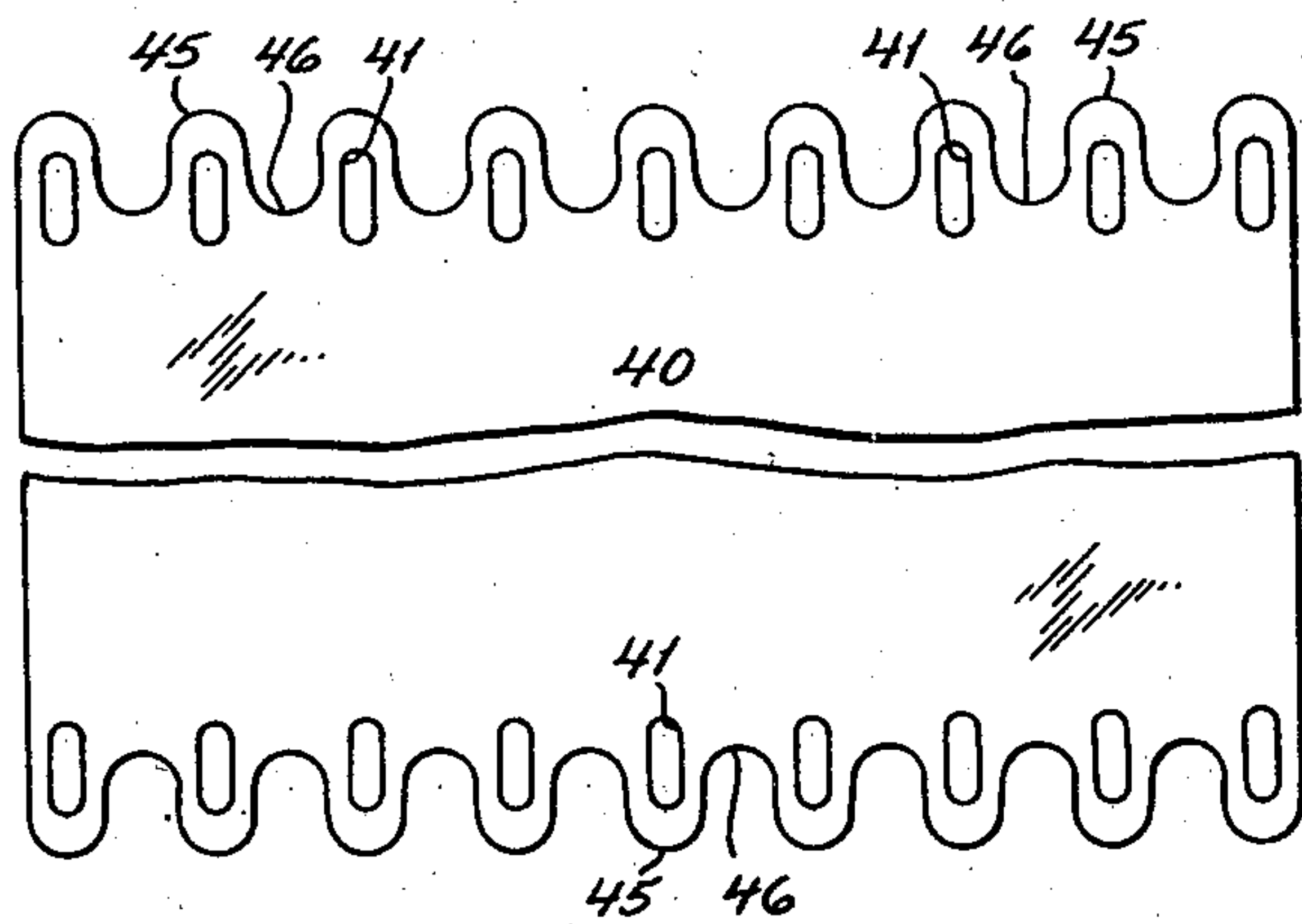


FIG. 7

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UNITED STATES PATENT OFFICE

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DEVICE FOR ATTACHING PRINTING MEMBERS ON DRUMS

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16 Claims. (Cl. 101—415.1)

This invention relates to a rotary printing machine, and more particularly to that type of rotary printing machine which uses a flexible blanket or plate. The invention is especially concerned with the method and apparatus for interchangeably placing the printing form or plate on the form roll, and for placing a rubber offset blanket or sheet on a transfer cylinder. These, therefore, are the general objects of this invention.

A more specific object is the provision of a manually operative mechanism for removing and positioning a flexible blanket, such as a printing form of the blank on a printing cylinder in such a manner that it will facilitate operating of the printing mechanism by unskilled workers.

A further object is the provision of a printing blanket tension mechanism for a rotary printing cylinder, which mechanism is mounted on the cylinder, and is arranged to retain the printing form thereon, together with a manually settable mechanism to release the tension mechanism by a reversal of the direction of rotation of the cylinder, such settable mechanism being arranged to be automatically rendered inactive consequent upon the rotating of the printing cylinder in the printing direction.

Another object is the provision of a combed plate adapted to depress parts of the printing plate on either side of the attaching holes thereof into recesses on either sides of attaching hooks of a plate retaining device carried by the printing mechanism.

Other objects of the invention will become apparent from the following description, which refers to a preferred embodiment thereof, as illustrated in the accompanying drawings.

In the drawings, Fig. 1 is a fragmentary front elevation of the invention incorporated in a printing machine, certain parts thereof being broken away to more clearly illustrate the internal construction thereof; Fig. 2 is a vertical section, taken substantially along the lines 2—2 of Fig. 1; Fig. 3 is a fragmentary section, similar to Fig. 2, certain of the parts being in a different position; Fig. 4 is a fragmentary side elevation of the printing mechanism, looking toward the left-hand end of Fig. 1; Fig. 5 is an elevation similar to Fig. 4, but illustrating certain parts in a different position; Fig. 6 is a detail in perspective; Fig. 7 is a plan of a printing form, used in connection with the mechanism illustrated, partially broken away for ease of illustration.

As shown in the drawings, the printing mechanism with which the invention is illustrated, comprises in general a pair of oppositely facing

side frame members 10 and 11, spaced apart by any suitable means, not shown. Mounted between the frame members 10 and 11, on a shaft 12, is a suitable rotatable form cylinder or roller 20. Beneath the form cylinder and rotatably mounted on a suitable shaft (not shown) is a contacting drum or roller 30. A printing plate 40, which may be a planographic plate or other flexible image-carrying member, is held on the drum 20 by means hereinafter more fully described.

The printing press illustrated may be either direct or offset,—that is to say, the roller 30 having an elastic surface 31, may be a platen, and the paper fed along a suitable support between the rollers 20 and 30, or the roller 30 may be a transfer roller and the paper being fed between it and a suitable platen roller, not shown.

Ink may be supplied to the plate 40 by any inking system, the form roller of which is generally indicated at 150, as contacting with the plate 20. One of the rollers of the press is driven as, for instance, the plate roller 20, by means of a gear 25 thereon, which is engaged by a suitable driving means, (not shown). The other parts of the press may rotate by frictional engagement with the plate roller or be drivingly geared thereto, as will be well understood.

In the plate drum 20 is shown a gap or opening of approximately a quarter circumference, bounded by radial surfaces 26 and 27. In this gap is mounted the plate holding device. As shown, the holding device comprises a fixed arcuate member 61 secured to the drum, as by suitable screws 63, and a movable arcuate member 62 mounted to slide circumferentially on the arcuate surfaces of the drum formed by the end members thereof. The two arcuate plates 61 and 62 each have projecting faces especially arranged, the fingers of one member projecting into the spaces of the other, so that the members telescope with each other.

The member 62 is suitably retained in its position by a spring 64, (Fig. 2) connected to an ear 65 depending inwardly from the member 62 and at the other end to one arm of a bell crank 50, hereinafter to be more fully described. This member 62 is given a tendency to move toward the member 61, as, for instance, by springs 67, anchored at one end to a rod 68 carried by the end members of the drum and at the other end to one arm of the bell crank 50, which is rigidly secured to a rock shaft 51 rotatably journaled in the end walls 53 of the drum. The other end of the bell crank 50 is provided with a slot 54, which engages a pin or bar 55 carried by the lug

65 in the member 62, hereinbefore mentioned, the arrangement being such that the springs 64 and 67 act to normally retain the member 62 in contact with the drum and move it circumferentially toward the relatively stationary member 61.

Each of the members 61 and 62 is formed adjacent its outer end with a series of external pockets 71 and 72, and in each pocket the member has a projecting lug or pin 73 or 74. These pins are adapted to occupy holes 41 formed in the tongued ends of the printing plate 40. Accordingly, the movement of the fastening member 62, under the influence of the spring 67, draws the plate 40 snugly about the printing press and retains it in position thereon.

According to the present invention, the movable member 62 is shiftable away from the stationary member 61, against the action of the spring 67, which engages the arms of the bell crank 50, by a reversal of the rotation of the printing drum, that is, by rotating the printing drum in a non-printing direction. A manually settable member 80 is provided to control this operation.

As shown in Fig. 1, the member 80 comprises a plunger 81, slidably mounted in the end frame member 10 and movable towards and away from the end wall 53 of the cylinder 20. When the plunger 81 is moved to an innermost position, that is, in the extreme position toward the printing cylinder 20, an enlarged head 82 thereof projects into the pass of a lever 83, which is rigidly secured to the rock shaft 51, carrying the bell crank 50, heretofore mentioned. When the cylinder is rotated in a clockwise or non-printing direction, that is, opposite the direction indicated in the arrow in Fig. 2, the edge 84 of the lever 83, (Figs. 1 and 6) will strike the head 82 of the plunger, causing the shaft 51 to be rocked in a counterclockwise direction, thereby moving the plate-retaining member 62 away from the stationary member 61, against the action of the spring 67. This relieves the tension on the printing plate 40, enabling it to be readily removed from the pins or lugs 74 on the movable retaining member 62. The drum is rotated further in a non-printing direction, until the printing plate is entirely stripped or removed from the cylinder. The rotation and rocking of the lever 83 permits it to pass the plunger 81 without damage to the parts.

When the printing drum is rotated in a counterclockwise direction, following the depression of the plunger 81, a bevelled surface 85 of the lever 84 will strike the head 82 of the plunger and cause it to be cammed outwardly, away from the printing drum, into a suitable recess 86 in the side frame member 10, thereby preventing any damage to the parts, should for any reason the printing cylinder be turned in a counterclockwise or printing direction before manually withdrawing the plunger 80.

When a new plate is to be mounted, the openings 41 at the upper end of the plate are first placed over the pins 73 of the stationary retaining member 61 and the printing drum rotated in the printing direction, until the pins 74 in the movable member 62 have reached the level of the openings 41 at the other end of the printing plate. The printing cylinder is now rotated a slight distance in a non-printing or clockwise direction, moving the movable retaining member 62 into registration with the openings 41, which are then placed over the pins 74 of such spring-actuated member and are there pressed into the depression 72 surrounding the base of the pins.

To facilitate the positioning of the printing plates on the pins or hooks 74, there is provided a swingable tined comb plate 90. This comb plate 90 is secured to a rock shaft 91, which is swingably mounted in the frame members 10 and 11 in front of the cylinder 20 and slightly above the axis thereof. The lowermost end of the plate 90 is provided with a series of notches which form tines 93 arranged in pairs, as shown in Fig. 1, to coact with the printing plate at either side of each retaining pin or lug 74. The rock shaft 91 extends through the left-hand wall or frame member 10, and is provided on its outer end with a lever 94. A suitable spring 95 acts between the lower end of the lever and the stationary frame member 10, to normally swing the tines of the plate away from the drum 20, and its associated parts.

When the operator has aligned the opening 41 of the plate with the lugs 74 of the movable securing member 62, as heretofore explained, he grasps the upper end of the lever 94 and rocks it together with the comb plate against the action of the spring 95, forcing the tines 93 thereof against the printing plate, thereby forcing the ends in the recesses 72 of the securing member 62.

It will be noted from Figs. 1 and 6 that the printing plate is especially adapted for use in the present invention, and is provided with a serpentine end, comprising a series of outwardly projecting tongues 45 separated by correspondingly formed recesses 46, the arrangement of the tongues 45 being such that they readily seat in respective recesses 71 and 72 in correspondingly shaped portions of the plate members 61 and 62. The tines 93 are so shaped and spaced that a pair of tines coact with each tongue of the printing plate, between the opening 41 therein and the sides of the tongue. This readily facilitates the positioning of the plate on the lugs 74. It will be noted that the openings 41 are for the most part in the tongues of the plate. Hence, the positioning of the plate on the drum is facilitated to the extent that each tongue is independently flexible. Therefore, when the plate is being positioned on the drum, the tendency of the plate to warp is practically eliminated.

The fork plate 90 is interlocked with the plunger 80, which controls the tensioning of the movable retaining member 62. This interlock is so arranged as to prevent the operator from swinging the comb plate 90 to inadvertently cause the tines thereof to coact with the printing plate. To this end, the outermost end of the plunger 81 has rigidly secured thereto a lever 85, the other end of which carries a pin 100. When the link 85 is in its normal position, that is, in the position shown in Fig. 4, the nose 82 of the plunger 81 is drawn into the recess 86 in the frame and out of the path of travel of the lever 83 of the printing plate tensioning mechanism, and the end 88 of the link 85 is in position to prevent any substantial movement of the lever 94 which operates the comb plate 90. The lower end 96 of such lever engaging the pin 100, carried by the link 85, before the plate 90 has been moved a distance sufficient to cause it to engage the printing plate, the printing drum or any part thereof.

When the printing blanket or plate is being positioned on the drum, the link 85 is first moved from the position shown in Fig. 4 to the position shown in Fig. 5, and the end of the plunger 81 cooperates with the lever 83 to relieve the

tension on the securing member 62, as heretofore described. When in this position, the end 88 of the link has been moved to such an extent that the operator may readily rock the lever 94 from the position shown in Fig. 4 to the position shown in Fig. 5, in which latter position the tines 93 of the plate 90 project into the opening 72 in the retaining member 62. A suitable opening 101 in the frame 10 is engaged by the pin 100 and acts to retain the link 85 in its uppermost position. Any inadvertent displacement or movement of the member 90 is prevented by reason of the fact that as soon as the machine is rotated in a printing direction, the plunger 81 will be forced outwardly, carrying the pin 100 out of contact with the recess 101, and permitting the member 85 to rock by gravity into contact with a pin 89 carried by the frame member 10, in which position the pin 100 coacts with the arm 96 of the lever 94 to prevent its movement.

From the foregoing description, it will be seen that this invention provides a mechanism for facilitating the positioning of a flexible printing blanket or form on a cylinder of a printing press and enables such blankets to be readily changed by unskilled operators, without liability of damage to either the printing blanket, the printing mechanism or the person of the operator. I have described the invention as adapted for use in applying a printing plate to its drum. However, in some instances the offset surface 31 comprises a comparatively thin rubber or composition blanket shaped similarly to the plate heretofore described and retained in position on the drum in much the same manner. In such instances, I may conveniently use my invention to apply the offset blanket to its drum.

I claim:

1. In a rotary printing or duplicating machine, a roll having means for anchoring thereon a printing plate or blanket, and a pressure device independent of the roll for forcing the end of such plate or blanket into cooperation with the anchoring device in position to receive it.

2. In a rotary printing or duplicating machine, a roll having means for anchoring thereon a printing plate or blanket, an external manually operable pressure device for forcing the end of such plate or blanket into cooperation with the anchoring device in position to receive it.

3. In a rotary printing or duplicating machine, a roll having means for anchoring thereon a printing plate or blanket, a device for forcing the end of such plate or blanket into cooperation with the anchoring device in position to receive it, and means to prevent the operation of the pressure device when the machine is in normal printing operation.

4. In a rotary printing or duplicating machine, a roller having means for anchoring thereon a printing plate or blanket, and a movable comb having tines to engage and force the end of such plate or blanket into cooperation with the anchoring device in position to receive it.

5. In a rotary printing machine, the combination of a frame, a drum mounted in the frame and having projections adapted to engage openings in a plate embracing the drum, and a device pivotally mounted on the frame and adapted to be moved to bear against the plate to force it into engagement with said projections.

6. In a rotary printing machine, a frame, a removable printing plate provided with projections at the ends thereof, a rotary drum mounted in the frame provided with guiding depressions

substantially corresponding with the projections on the printing plate, and a movable member carried by said frame and adapted to engage the projections of the printing plate to facilitate the mounting of the plate on the drum.

7. In a rotary printing machine, a frame, a removable printing plate provided with projections at the ends thereof, a rotary drum mounted in the frame with guiding depressions substantially corresponding with the projections on the printing plate, and a movable comb plate mounted on said frame and adapted to engage the projections of the printing plate to facilitate the mounting of the plate on the drum.

8. In a rotary printing machine, a removable metallic printing plate provided with perforated serpentine projections at the ends thereof, a rotary drum having hooks to engage said perforations, said drum also being provided with guiding depressions substantially corresponding with the projections on the printing plate, and a movable comb plate having tines adapted to engage the projections of the printing plate between the edges of the perforations and the edges of the projections to facilitate the mounting of the plate on the drum.

9. In a rotary printing machine, a frame, a drum rotatably mounted in the frame, means on the drum for anchoring a printing plate or blanket by engaging perforated projections at the end of the plate or blanket, said means including hooks on the drum for entering the perforations in the plate or blanket, said drum having guiding recesses corresponding to the projections on the plate or blanket, and rockable means mounted on said frame to engage the projections of the plate or blanket and force them into the recesses in the drum.

10. In a rotary printing machine, a frame, a drum rotatably mounted in the frame, means on the drum for anchoring a printing plate or blanket by engaging perforated projections at the end of the blanket, said means including hooks on the drum for entering the perforations in the blanket, said drum having a guiding means for the end of the blanket or plate, and rockable means mounted on said frame to engage the projections of the plate and force them into the recess in the drum, and means to prevent the operation of said last-named means during the normal operation of the printing machine.

11. In a rotary printing machine including a frame, a drum rotatably mounted therein, a device for anchoring one end of a printing plate or blanket to the drum, said device comprising a member mounted for sliding movement in an arcuate path on the drum, said member having means to engage one end of a printing plate or blanket, a lever pivotally connected to said member, a movable stop carried by the frame and adapted to be positioned in the path of said lever to cause a shifting of said member, and means to automatically move the stop to an inactive position consequent upon the rotation of the drum in a printing direction.

12. In a rotary printing machine including a frame, a drum rotatably mounted therein, a device for anchoring one end of a printing plate to the drum, said device comprising a member mounted for sliding movement in an arcuate path on the drum, said member having means to engage one end of a printing plate, a rock shaft carried by the drum, a lever carried by said shaft and pivotally connected to said member, a second lever carried by said shaft exterior of the

drum, a movable stop carried by the frame adapted to be positioned in the path of said second-named lever to cause a shifting of said member, and means to automatically move the stop to an inactive position consequent upon the rotation of the drum in a printing direction.

13. In a rotary printing machine including a frame having a drum rotatably mounted therein, an anchoring device for one end of a printing plate, said device comprising a member mounted for sliding movement in an arcuate path on the drum, said member having means to engage one end of a printing plate, a lever pivotally connected to said member, a movable stop carried by the frame and positioned in the path of said lever to cause a shifting of said member, and means to automatically move the stop to an inactive position consequent upon the rotation of the drum in a printing direction, said means including a cam operatively connected to said lever.

14. A rotary printing or duplicating machine, comprising a form roll having means for anchoring thereon a printing plate, said means comprising an anchorage device carried by the roll, a device for forcing the end of the plate into cooperation with the anchoring device when the anchoring device is in a position to receive it, said anchoring device comprising a member movably mounted on the form roll, tension means to shift said member to tension the plate on the drum, a movable stop to shift the anchoring device against the action of the tensioning device.

15. A rotary printing or duplicating machine, comprising a form roll having means for anchoring thereon a printing plate, said means comprising an anchoring device carried by the roll, a movable device for forcing the end of the plate into cooperation with the anchoring device when the anchoring device is in a position to receive it, said anchoring device comprising a member movably mounted on the form roll, tension means to shift said member to tension the plate, a movable stop to shift the anchoring device against the action of the tensioning device, and wherein said movable device is retained inoperative by said stop during the normal operation of the printing machine.

16. A rotary printing or duplicating machine, comprising a form roll having means for anchoring thereon a printing plate, said means comprising an anchoring device carried by the roll, a manually operable device for forcing the end of the plate into cooperation with the anchoring device when the anchoring device is in a position to receive it, said anchoring device comprising a member mounted on the form roll for movement in an arcuate path, tension means to shift said member to tension the plate, a movable stop to shift the anchoring device against the action of the tensioning device, and wherein said manually operable device is retained inoperative by said stop during the normal operation of the printing machine.

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