

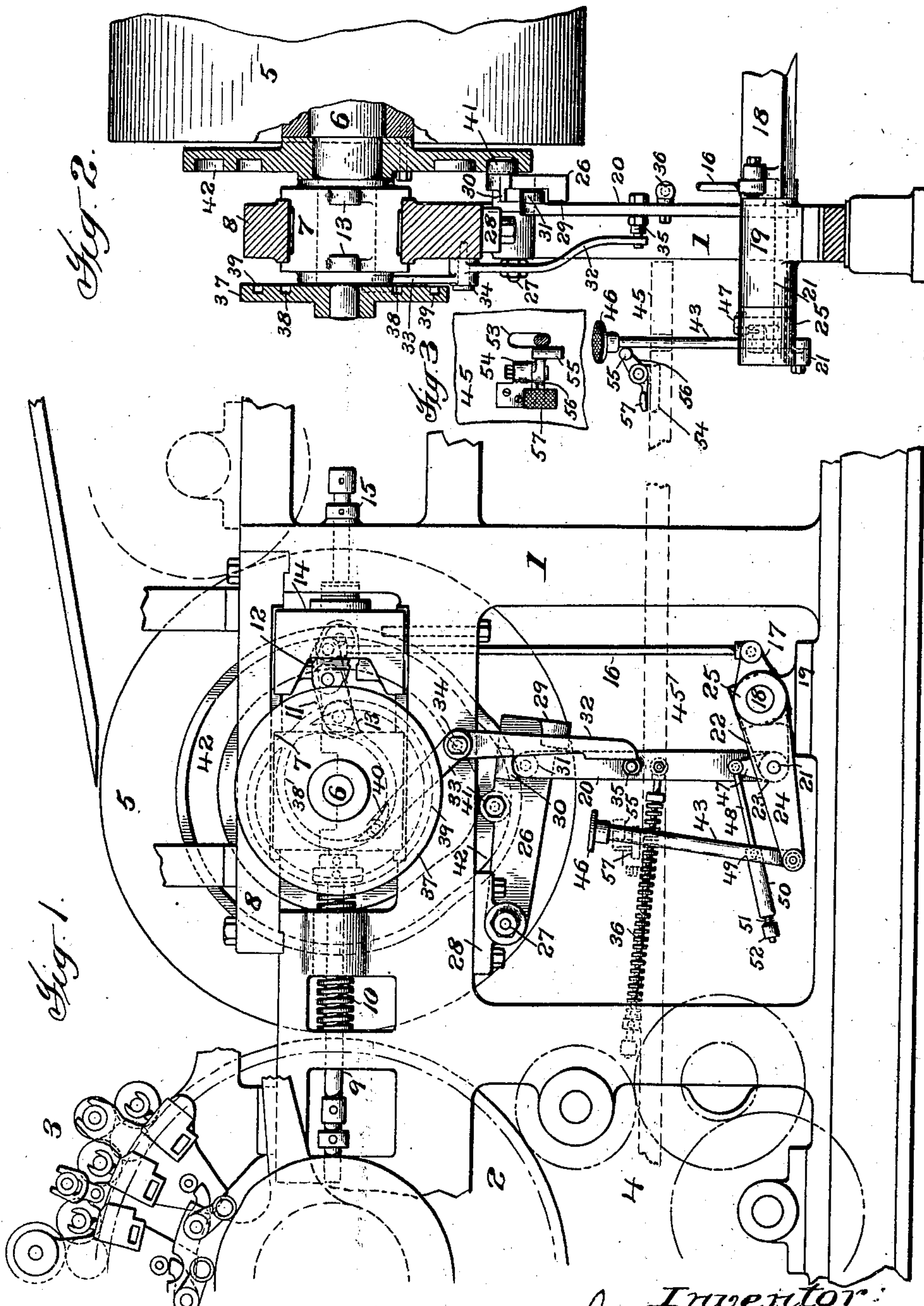
No. 753,947.

PATENTED MAR. 8, 1904.

J. WHITE.
PRINTING MACHINE.
APPLICATION FILED JAN. 7, 1902.

NO MODEL.

2 SHEETS—SHEET 1.



Attest:
O. P. Kehoe
J. H. Brown

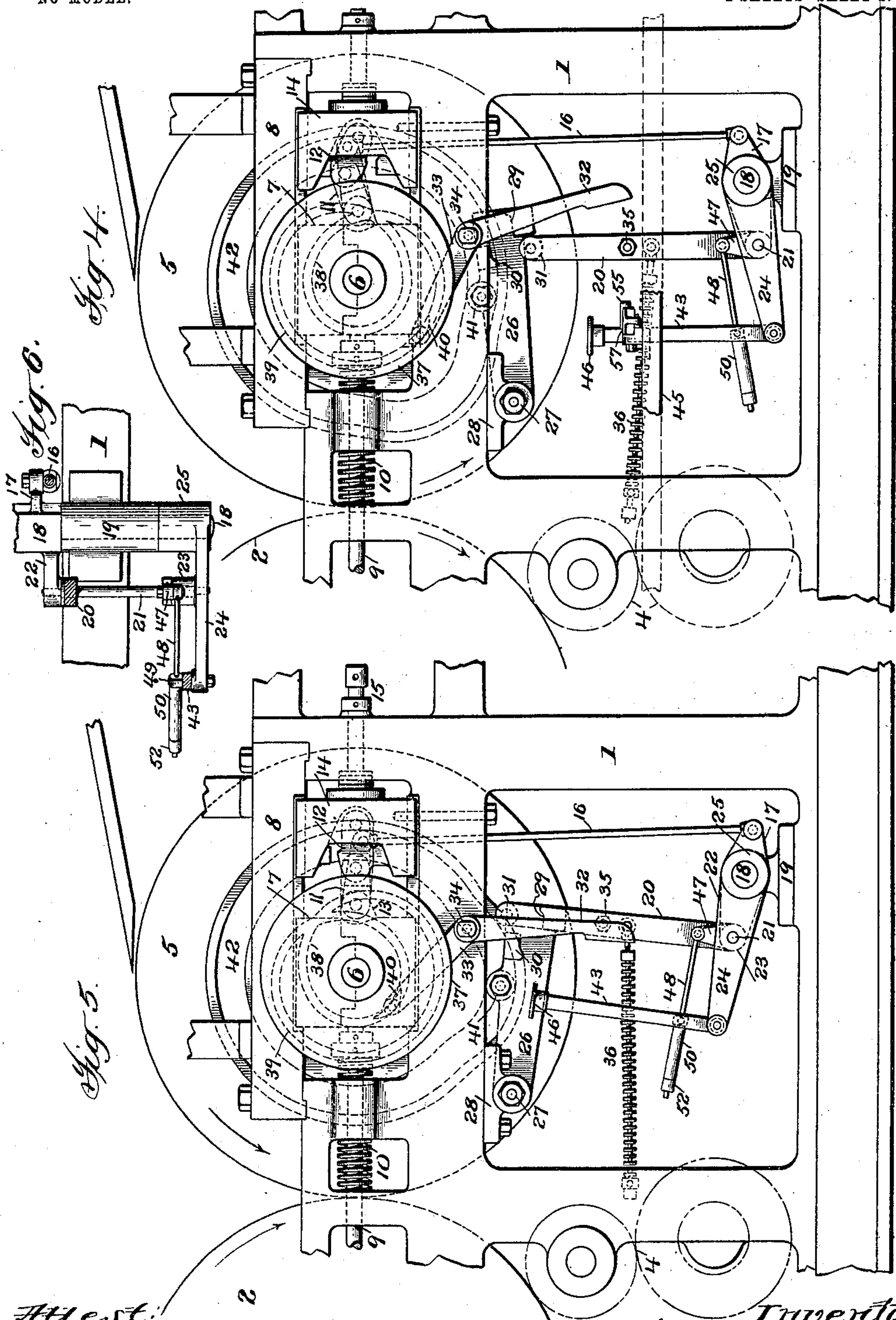
Inventor:
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PRINTING MACHINE.

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2 SHEETS—SHEET 2.



Attest:
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UNITED STATES PATENT OFFICE.

JOSEPH WHITE, OF NEW YORK, N. Y., ASSIGNOR TO ROBERT HOE, OF
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PRINTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 753,947, dated March 8, 1904.

Application filed January 7, 1902. Serial No. 88,719. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH WHITE, a citizen of the United States, residing at New York, county of New York, and State of New York, have invented certain new and useful Improvements in Printing-Machines, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

This invention relates to certain improvements in printing-machines.

In certain classes of printing it is desirable to subject the form between impressions a plurality of times to the operation of the inking mechanism in order to thoroughly distribute and work the ink into the form, this procedure being known as "double rolling." In order to effect this double rolling, it is necessary to keep the impression member out of printing contact with the form-carrying member while this member is being subjected to additional operations of the inking mechanism. It is also desirable in printing-machines to provide mechanism whereby the operator may, without stopping the operation of the machine, suspend the printing operation, either for an indefinite length of time or for one cycle of operations of the machine—as, for instance, when a sheet is missed—and to do this at any time.

In machines of the stop-cylinder type, in which the cylinder has a low side, it is customary to provide for double rolling by arranging a tripping mechanism which holds the cylinder in its stopped position until the form has made the extra reciprocation or reciprocations beneath the form-rollers. In other words, in this class of machines, the double rolling is provided for by prolonging the period during which the cylinder is stopped. The tripping mechanism, or the mechanism which provides for double rolling on stop-cylinder machines, is not, however, applicable to machines—such, for instance, as machines of the two-revolution type or machines of the purely rotary type—in which the relative position of the members of the printing-couple must be varied in order to interrupt the printing contact. It is also desirable that the construction of ma-

chines which are arranged so that the double rolling may be effected by varying the relative position of the members of the couple to interrupt the printing contact should also be of such a character that the couple may be arranged for single rolling—i. e., the machine should be of such a character that it may be used either for single or double rolling, according to the product required.

It is one of the objects of this invention to produce an improved printing-machine in which double rolling is provided for by varying the relative position of the two members of the couple in order to interrupt the printing contact, the printing contact being kept interrupted while the double-rolling operation is carried out.

A further object of the invention is to produce an improved machine which is provided with automatic means for varying the relative position of the members of the couple to interrupt the printing contact and keep it interrupted during the double-rolling operation, the interrupting means being in whole or in part under the control of the operator, so that the printing contact of the couple may be interrupted by the operator at any time.

A further object of the invention is to produce an improved machine which is provided with means for varying the relative position of the members of the couple in order to interrupt the printing contact and keep it interrupted during the double-rolling operation, said machine also including means by which the interrupting means may be rendered inoperative when it is desired to use the machine with single rolling.

With these and other objects in view the invention consists in certain constructions and in certain parts, improvements, and combinations, as will be hereinafter fully described and then specifically pointed out in the claims hereunto appended.

Referring to the accompanying drawings, in which like characters of reference indicate the same parts, Figure 1 is a view of so much of a rotary printing-machine as is necessary to an understanding of the invention. Fig. 2 is an elevation, partly in section, of one end of

one of the members of the printing-couple shown in Fig. 1 and certain of the interrupting devices connected therewith. Fig. 3 is a detail view. Fig. 4 is a view similar to Fig. 1, but showing the various parts in a different position. Fig. 5 is a view of the machine arranged for single rolling. Fig. 6 is a detail view.

Referring to the drawings, the machine which has been selected to illustrate the invention is a machine of the rotary type. The frame of the machine, which may be of any desired construction and configuration, is marked 1. The form-carrying member of the machine consists of a cylinder 2, said cylinder being suitably journaled in the frame. Operating in connection with the form-carrying cylinder 2 is an inking mechanism 3, which is or may be of any well-known type. The driving mechanism of the machine is indicated in part at 4, the cylinder 2 being in this instance the driven member. This driving mechanism is or may be of any well-known character, and a full description and illustration of it is unnecessary. The impression member consists of a cylinder 5, said cylinder being mounted on a shaft 6, which in turn is mounted on boxes 7, supported in the usual manner in the frame 1, these boxes being held in position by means of suitable cap-pieces 8 or in any other desired manner.

In the preferred form of the construction the invention will be embodied in a rotary machine of the character known in the art as a "single-revolution" machine—that is, a machine which is so constructed that it can take and print a sheet on each revolution of the cylinder, distinguished from machines known in the art as "multirevolution-machines"—that is to say, machines which take a sheet on one revolution and then make one or more revolutions during which the sheet is delivered and the cooperating printing members get into position to again effect a printing operation. In machines of the single-revolution type the members of the printing-couple are normally in printing contact, and this contact is undisturbed during the ordinary operations of the machine—that is to say, while a sheet is being printed and delivered. In the multirevolution-machines, however, the printing-cylinders are not normally in contact, but are first thrown into contact to print and then thrown out of contact. In other words, in single-revolution machines the printing-couples will remain in contact indefinitely unless one of the members of the couple be tripped, while in multirevolution-machines the members of the couple are necessarily separated after each printing operation.

In order to provide for the double-rolling operation and also to enable the operator to suspend the operation of the machine when desired without stopping it, means are provided for varying the relative position of the members of the couple in order to move them

out of printing contact. While either or both members of the couple may be moved, if desired, to interrupt the printing contact, in the construction shown the arrangement is such that the sheet-carrying member is moved, and to this end the boxes 7 are slidably mounted in the frame.

The means by which the sliding boxes 7 are moved to interrupt the printing contact may be of any desired construction. As shown, rods 9 are provided, which are suitably mounted in the frame, these rods being caused to press against the boxes by means of springs 10, the arrangement being such that these spring-rods normally tend to force the cylinder 5 away from the cylinder 2. Suitable means are provided for forcing the cylinder 5 into printing contact with the cylinder 2 against the force of the spring-rods, which means may be of any desired construction. As shown, each box 7 has connected to it a pair of toggle-levers, the members of the toggles being marked 11 and 12. The members 11 of the toggles are pivotally mounted in ears 13 on the boxes 7, (see Fig. 2,) and the members 12 are pivotally mounted in blocks 14, which are held in position by means of adjustable stops 15.

It may be here remarked that the two sides of the machine are duplicates so far as the spring-rods, the boxes, the toggles, the blocks, and the stops are concerned, and therefore only one side of the machine is shown. The toggles are so arranged that when they are made the cylinder 5 is forced forward against the tension of the spring-rods and into contact with the form-cylinder 2. When, however, the toggles are broken, the spring-rods force the cylinder out of printing contact, the respective positions being indicated in Figs. 1 and 5.

The means for making and breaking the toggles may be of any suitable construction. As shown, each member 11 has connected to it a rod 16, said rods being also connected to arms 17, which extend from a square shaft 18, which is suitably mounted in bearings 19 on the frame of the machine. As this shaft is rocked, therefore, it will be seen that the toggles will be made and broken.

The means by which the shaft 18 is rocked may be varied widely in construction. These means will, however, include devices which are automatically operated and devices which are under the control of the operator. The automatic devices come into operation once for every cycle of operations of the machine, and the devices under the control of the operator are of such a character that the operator may rock the shaft and separate the members of the couple whenever desired.

The automatic devices referred to include an actuator-bar 20, which is pivotally mounted on a short shaft 21, this shaft being carried by a bearing 22, (see Fig. 6,) which extends

outward from the shaft 18, and by a bearing 23, which is carried on an arm 24, extending from a hub 25, secured to the end of the shaft 18. A driver, which may vary widely in construction, may be provided for this actuator-bar. As shown, it consists of a block 26, pivoted at 27 to a bearing 28, suitably secured to the frame. In the construction shown the driver is arranged to operate the actuator-bar in both directions, so that the toggles may be made and broken by the actuator-bar. The construction by which the driver thus operates the actuator-bar in both directions may be of any suitable character. As shown, however, this driver is provided with shoulders 29 and 30, said shoulders being arranged to contact when the actuator-bar is in proper position with a projection which is in the form of a roller 31, mounted on the actuator-bar. The shoulder 29 when the actuator-bar is in proper position takes under the roller 31 and lifts the bar to make the toggles, while the shoulder 30 when the actuator-bar is in proper position acts on the other side of the roller 31 and forces the bar downward to break the toggles.

In order to properly position the bar to be acted upon by the shoulders on the driver, suitable positioning devices are provided, which may be varied widely. As shown, they include a two-armed lever 32 33, said lever being pivoted at 34 to the frame of the machine. The arm 32 when the lever is suitably operated is arranged to contact with a stud 35, carried on the actuator-bar, this stud being made removable for a purpose which will be hereinafter stated. The actuator-bar has connected to it a spring-rod 36 of ordinary construction, the purpose of which is to move the bar in opposition to the lever 32 33, and the parts are so arranged that when the lever 32 33 is operating on the bar 20, it will be beneath and in position to be operated upon by the shoulder 30 on the driver, while when the bar is free to be moved by the spring-rod it will be positioned so that it will be operated upon by the shoulder 29 of the driver.

The operation of the positioning-lever 32 33 may be produced by any suitable means. These means must, however, be of such a character as to cause the lever to move the bar into position after each printing operation of the couple to allow the members to be separated, so that the printing member may make its extra revolution or revolutions to cause the inking mechanism to operate upon the form a plurality of times, and the construction in general must be such as to hold the members separated while the printing member is making its extra revolution or revolutions. As shown, the positioning-lever 32 33 is arranged to be operated by a suitable cam, and since the machine shown is so constructed that the form-carrying cylinder is given one extra revolution for the purpose of double

rolling this cam is of such a character that it moves the positioning-lever and causes this lever to operate the actuator on every other revolution of the cylinders. In the construction shown this cam consists of a cam-plate 37, having an inner groove 38 and an outer groove 39, these grooves being coincident at one point. The arm 33 of the lever carries a guide-block 40, which is of such a shape that it runs into one groove and then into the other as it comes to the meeting-point of the grooves. When this cam-block is in the inner groove 38, the positioning-lever is swung forward, so that its arm 32 strikes the stud 35 and swings the actuator-bar 20. When, however, this block is in the outer groove, the positioning-lever is moved back into the position shown in Fig. 4, the spring-rod 36, when it is free to act, operating to throw the actuator-bar into position so that it will be operated upon by the shoulder 29.

The driver 26 may be operated in any suitable manner. As shown, it is provided with a stud 41, which runs in the groove of a closed cam 42, mounted on the cylinder-shaft 6, so that the driver is given a reciprocation for each revolution of the cylinder 5.

With the construction so far described it is obvious that the cam 37, through the guide-block 40, will operate the positioning-lever on every other revolution of the cylinder 5. As the parts are shown in Fig. 1 the guide-block is running in the inner groove 38 and the positioning-lever has been operated to shift the position of the bar 20, so that the roller 31 is moved under the shoulder 30. As shown in this figure, the driver 26 has just been operated by the cam 42 and the shoulder 30 has forced the actuator-bar downward, thus rocking the shaft 25 and through the agency of the rod 16 has broken the toggles. As the cylinder continues its movement the guide-block will at the meeting-point of the grooves run out of the groove 38 into the groove 39, thus causing the positioning-lever to swing back so that its arm 32 will be out of contact with the stud 35. This position of the lever is shown in Fig. 4. The spring-rod 36 if free to act upon the actuator-bar 20, as it normally will be, will now push the actuator-bar over against the shoulder 29, and as soon as the cam 42 has moved the driver 26 downward the roller 31 will be given a further movement by the spring, thus positioning it above the shoulder 29. The driver is now given an upward movement by its cam, thus rocking the actuator-bar and the shaft 25 and making the toggles. The cylinders will therefore be in printing contact on one revolution and out of contact on the next revolution, so that the form-carrier will pass twice under the rolls of the inking mechanism 3, thus double rolling the form.

It is desirable that the means for changing the position of the cylinders be always under

the control of the operator, so that the operator may separate the cylinders at any time—as, for instance, when a sheet is missed in feeding or for other reasons. The mechanism by which this is accomplished may be varied widely in construction. As shown, the lever 24 has connected to it a controller-bar 43, said controller-bar extending up through the feeder's platform 45 (see Fig. 4 and dotted lines in the other figures) and terminating in a foot-plate 46. It is apparent that the operator can at any time except when the parts are in the position shown in Fig. 1, when the toggles are already broken by stepping on the foot-plate 46 break the toggles and separate the cylinders. When the operator has thus actuated the controller-bar, it is desirable that the actuator-bar 20 be moved, so that it will not until the operator again desires to have the toggles made be operated by the shoulder 29, in which case the bar would be immediately lifted and the toggles made. To this end therefore a connection is made between the controller-bar and the actuator-bar. In the construction shown the shaft 21, to which the actuator-bar 20 is secured, has extending upward from it an arm 47, to which is connected a link 48. This link 48 passes through a puppet 49, carried on the controller-bar 43, and on the other side of the puppet the link is provided with a socket 50, which is loose thereon, and located in this socket is a spring 51, the spring bearing against a collar 52 on the end of the link. The feeder's platform 45 is provided with a slot 53, (see Fig. 3,) through which the controller-bar passes and in which the bar is allowed to have a limited movement. Alongside this slot is located a bracket 54, to which is pivoted a latch 55, said latch being located at one end of a lever 56, the other end of the lever being provided with a foot-plate 57. As long as the automatic mechanism for moving the cylinder is operating the controller-bar 43 moves up and down idly, being held against one end of the slot, as shown in Fig. 3, by the action of the spring 51, which is comparatively weak. The operator places his foot on the controller-lever and through it operates the toggle-breaking mechanism, which pushes the controller-bar to the other end of the slot 53, and the latch 55 drops in behind the controller, as shown in Fig. 4. This downward and side-wise movement of the controller compresses the spring 51 and throws the actuator-bar into the position shown in Fig. 4, in which position it is locked, because the latch prevents the spring-rod 36 from pushing the bar 20 into position where the roller 31 would be in the path of the shoulder 29. Furthermore, when the operator desires to allow the automatic mechanism which controls the position of the cylinder to again come into operation he steps on the latch, and this allows the spring

36 to act on the actuator-bar, unless it is in the position shown in Fig. 5, and push it over, so that on the next revolution of the cylinder the roll 31 will be above and the actuator-bar lifted by the shoulder 29.

It is apparent that the controller can also be used as a setting mechanism. The operator can at any time push the controller over, so that the latch will fall behind it without pushing it down. This movement of the controller will swing the actuator-bar into the position where on the next revolution of the cylinder the roll 31 will be struck by the shoulder 30, which through the mechanism already described breaks the toggles. The latch, however, prevents the return of the actuator-bar, so that in this case the machine will remain tripped until the operator again steps on the latch.

When it is desired to use the machine for single-rolling printing, the stud 35 is removed from the actuator-bar. The positioning-lever will now operate idly, and the actuator-bar will not, therefore, be moved into the path of the shoulder 30. The cylinder will therefore remain in contact on every revolution. The position of the parts when the stud 35 is removed is indicated in Fig. 5.

The invention has been shown as embodied in a machine of a rotary type. This is a machine in which both the impression and form-carrying members of the couple are cylinders. It is to be understood, however, that some features of the invention may be used with machines other than those of the rotary type. While the construction described is an efficient one for carrying out the invention, it is to be understood that the invention may be embodied in constructions which are widely different from the one shown. The invention is not, therefore, to be limited to the specific construction which has been described in the foregoing specification.

What is claimed is—

1. The combination with the form-carrying and impression members of a rotating single-revolution printing-couple the members of which are normally in contact and the inking mechanism, of means for moving one of said members to interrupt their printing contact, automatic devices for operating said means, and devices under the control of the operator for also operating said means, substantially as described.

2. The combination with the form-carrying and impression members of a rotating single-revolution printing-couple the members of which are normally in contact and the inking mechanism, of means for moving the impression member away from the form-carrying member so as to interrupt the printing contact and keep it interrupted while the form-carrying member makes a revolution, automatic devices for operating said moving

means, and devices under the control of the operator for also operating said moving means, substantially as described.

3. The combination with the form-carrying and impression members of a printing-couple which are normally in contact and the inking mechanism, of automatic means for moving one of said members away from the other member to interrupt the printing contact, said means operating to keep the members separated while the form-carrying member completes a movement corresponding to the printing movement, and means for interrupting the action of said automatic means in order to keep the members separated, substantially as described.

4. The combination with the form-carrying and impression members of a printing-couple which are normally in contact and the inking mechanism, of automatic means for moving one of said members away from the other member to interrupt the printing contact, said means operating to keep the members separated while the form-carrying member completes a movement corresponding to the printing movement, and means under the control of the operator for interrupting the action of said automatic means in order to keep the members separated, substantially as described.

5. The combination with the form-carrying and impression cylinders of a rotating single-revolution printing-couple the members of which are normally in contact and the inking mechanism, of automatic means for moving the impression-cylinder toward and away from the form-carrying cylinder, said means operating to keep the cylinders out of printing contact while the form-carrying cylinder makes a revolution, and means for interrupting the action of said automatic means in order to keep the cylinders separated, substantially as described.

6. The combination with the form-carrying and impression cylinders of a rotating single-revolution printing-couple the members of which are normally in contact and the inking mechanism, of automatic means for moving the impression-cylinder toward and away from the form-carrying cylinder, said means operating to keep the cylinders out of printing contact while the form-carrying cylinder makes a revolution, and means under the control of the operator for interrupting the action of said automatic means in order to keep the cylinders separated, substantially as described.

7. The combination with the form-carrying and impression members of a printing-couple and the inking mechanism, of means for moving one of said members into and out of printing contact, means including an actuating member for causing the operation of said moving means, an operating mechanism capacitated to produce the movement of the actuating member in both directions, an auto-

matic positioning device for said member, and means under the control of the operator for actuating the moving means, substantially as described.

8. The combination with the form and impression cylinders of a rotating printing-couple said cylinders being normally in contact and the inking mechanism, of cylinder-moving means operating to move one of the cylinders into and out of printing contact with the other, means including an actuating member for causing the operation of said moving means, an operating mechanism capacitated to produce the movement of the member in both directions, and an automatic positioning device for said member, substantially as described.

9. The combination with the form and impression cylinders of a rotating printing-couple and the inking mechanism, of a cylinder-moving means operating to move one of the cylinders into and out of printing contact with the other, means including an actuating member for causing the operation of said moving means, an operating mechanism capacitated to produce the movement of the member in both directions, an automatic positioning device for said member, and means under the control of the operator for actuating the cylinder-moving means, substantially as described.

10. The combination with the form-carrying and impression members of a printing-couple said members being normally in contact and the inking mechanism, of means for moving one of the members into and out of printing contact, means including an actuating member for causing the operation of said moving means, an operating mechanism, an automatic positioning device for the actuating member, and a controller for the actuating member, substantially as described.

11. The combination with the form-carrying and impression members of a printing-couple said members being normally in contact and the inking mechanism, of means for moving one of the members into and out of printing contact, means including an actuating member for causing the operation of said moving means, an operating mechanism, an automatic positioning device for the actuating member, a controller for the actuating member, and a locking device for said controller, substantially as described.

12. The combination with the form and impression cylinders of a printing-couple said cylinders being normally in contact and the inking mechanism, of means for moving one of the cylinders into and out of printing contact with the other cylinder, means including an actuating member for causing the operation of said moving means, an operating mechanism, an automatic positioning device for the actuating member, and a controller for the actuating member, substantially as described.

13. The combination with the form and im-

pression cylinders of a printing-couple said cylinders being normally in contact and the inking mechanism, of means for moving one of the cylinders into and out of printing contact with the other cylinder, means including an actuating member for causing the operation of said moving means, an operating mechanism, an automatic positioning device for the actuating member, a controller for the actuating member, and a locking device for said controller, substantially as described.

14. The combination with the members of a printing-couple and the inking mechanism, of means for moving one of the members toward and away from the other, means including an actuating member for causing the operation of said moving means, an operating mechanism, an automatically-operated positioning device, a controller for the actuating member, and connections whereby the controller operates the moving means, substantially as described.

15. The combination with the members of a printing-couple and the inking mechanism, of means for moving one of the members toward and away from the other, means including an actuating member for causing the operation of said moving means, an operating mechanism, an automatically-operated positioning device, a controller for the actuating member, connections whereby the controller operates the moving means, and a locking device for said controller, substantially as described.

16. The combination with the form and impression cylinders of a printing-couple and the inking mechanism, of means for moving one of the cylinders toward and away from the other, means including an actuating member for causing the operation of said moving means, an operating mechanism, an automatically-operated positioning device, a controller for the actuating member, and connections whereby the controller operates the moving means, substantially as described.

17. The combination with the form and impression cylinders of a printing-couple and the inking mechanism, of means for moving one of the cylinders toward and away from the other, means including an actuating member for causing the operation of said moving means, an operating mechanism, an automatically-operated positioning device, a controller for the actuating member, connections whereby the controller operates the moving means, and a locking device for said controller, substantially as described.

18. The combination with a form-carrier and impression-cylinder which are normally in contact, of cylinder-moving means, an operating mechanism capacitated to produce a movement of the cylinder in both directions, means including a movable actuator between the operating mechanism and the moving means, and a constantly-rotating member for operating the actuator, substantially as described.

19. The combination with a form-carrier and impression-cylinder which are normally in contact, of cylinder-moving means, an operating mechanism capacitated to produce a movement of the cylinder in both directions, means including a movable actuator between the operating mechanism and the moving means, a constantly-rotating member for operating the actuator, and a controller for the movable actuator, substantially as described.

20. The combination with a form-carrier and impression-cylinder which are normally in contact, of cylinder-moving means, an operating mechanism capacitated to produce a movement of the cylinder in both directions, means including a movable actuator between the operating mechanism and the moving means, a constantly-rotating member for operating the actuator, a controller for the movable actuator, and a locking device for said controller, substantially as described.

21. The combination with a form-carrier and impression-cylinder, of cylinder-moving means, an operating mechanism capacitated to produce a movement of the cylinder in both directions, means including a movable actuator between the operating mechanism and the moving means, a constantly-rotating member for operating the actuator, a controller for the movable actuator, and connections whereby the controller operates the cylinder-moving means, substantially as described.

22. The combination with a form-carrier and impression-cylinder, of cylinder-moving means, an operating mechanism capacitated to produce a movement of the cylinder in both directions, means including a movable actuator between the operating mechanism and the moving means, a constantly-rotating member for operating the actuator, a controller for the movable actuator, connections whereby the controller operates the cylinder-moving means, and a locking device for said controller, substantially as described.

23. The combination with a form-carrier and an inking mechanism, of an impression-cylinder, means for moving the cylinder toward and away from the form-carrier, means including a movable actuator for operating the cylinder-moving means, a driver provided with means for moving the actuator in opposite directions, and an automatically-operated positioning device for moving the actuator so that it may be operated alternately in opposite directions by the driver, substantially as described.

24. The combination with a form-carrier and an inking mechanism, of an impression-cylinder, means for moving the cylinder toward and away from the form-carrier, means including a movable actuator for operating the cylinder-moving means, a driver provided with means for moving the actuator in opposite directions, an automatically-operated positioning device for moving the actuator so that it may be operated alternately in opposite directions by

the driver, a controller, and connections between the controller and the movable actuator, substantially as described.

25. The combination with a form-carrier and an inking mechanism, of an impression-cylinder, means for moving the cylinder toward and away from the form-carrier, means including a movable actuator for operating the cylinder-moving means, a driver provided with means for moving the actuator in opposite directions, an automatically-operated positioning device for moving the actuator so that it may be operated alternately in opposite directions by the driver, a controller, connections between the controller and the movable actuator, and a locking device for said controller, substantially as described.

26. The combination with a form-carrier and an inking mechanism, of an impression-cylinder, means for moving the cylinder toward and away from the form-carrier, means including a movable actuator for operating the cylinder-moving means, a driver provided with means for moving the actuator in opposite directions, an automatically-operated positioning device for moving the actuator so that it may be operated alternately in opposite directions by the driver, a controller, connections between the controller and the movable actuator, and connections between the controller and the cylinder-moving means, substantially as described.

27. The combination with a form-carrier and an inking mechanism, of an impression-cylinder, means for moving the cylinder toward and away from the form-carrier, means including a movable actuator for operating the cylinder-moving means, a driver provided with means for moving the actuator in opposite directions, an automatically-operated positioning device for moving the actuator so that it may be operated alternately in opposite directions by the driver, a controller, connections between the controller and the movable actuator, connections between the controller and the cylinder-moving means, and a locking device for said controller, substantially as described.

28. The combination with a form-carrier and an inking mechanism, of an impression-cylinder, means for moving the cylinder toward and away from the form-carrier, a pivotally-mounted actuator, connections between the actuator and the cylinder-moving means, a driver provided with means for moving the actuator in opposite directions, a cam-controlled positioning-lever for operating the actuator, a controller, and connections between the controller and the actuator, substantially as described.

29. The combination with a form-carrier and an inking mechanism, of an impression-cylinder, means for moving the cylinder toward and away from the form-carrier, a pivotally-mounted actuator, connections between the actuator and the cylinder-moving means, a

driver provided with means for moving the actuator in opposite directions, a cam-controlled positioning-lever for operating the actuator, a controller, connections between the controller and the actuator, and a locking device for said controller, substantially as described.

30. The combination with a form-carrier and an inking mechanism, of an impression-cylinder, means for moving the cylinder toward and away from the form-carrier, a pivotally-mounted actuator, connections between the actuator and the cylinder-moving means, a driver provided with means for moving the actuator in opposite directions, a cam-controlled positioning-lever for operating the actuator, a controller, connections between the controller and the actuator, and connections between the controller and the cylinder-moving means, substantially as described.

31. The combination with a form-carrier and an inking mechanism, of an impression-cylinder, means for moving the cylinder toward and away from the form-carrier, a pivotally-mounted actuator, connections between the actuator and the cylinder-moving means, a driver provided with means for moving the actuator in opposite directions, a cam-controlled positioning-lever for operating the actuator, a controller, connections between the controller and the actuator, connections between the controller and the cylinder-moving means, and a locking device for said controller, substantially as described.

32. The combination with a form-carrier and an inking mechanism, of an impression-cylinder, cylinder-moving means including a rock-shaft and suitable connections, a driver, a movable actuator, connections between the actuator and the rock-shaft, means whereby the driver operates the actuator to rock the shaft in either direction, means including a positioning-lever for determining in which direction the actuator shall be moved by the driver, a controller and connections between the controller and the actuator whereby the controller determines the position of the actuator independent of the positioning-lever, substantially as described.

33. The combination with a form-carrier and an inking mechanism, of an impression-cylinder, cylinder-moving means including a rock-shaft and suitable connections, a driver, a movable actuator, connections between the actuator and the rock-shaft, means whereby the driver operates the actuator to rock the shaft in either direction, means including a positioning-lever for determining in which direction the actuator shall be moved by the driver, a controller, connections between the controller and the actuator whereby the controller determines the position of the actuator independent of the positioning-lever, and a locking device for said controller, substantially as described.

34. The combination with a form-carrier and an inking mechanism, of an impression-cylinder, cylinder-moving means including a rock-shaft and suitable connections, a driver, a movable actuator, connections between the actuator and the rock-shaft, means whereby the driver operates the actuator to rock the shaft in either direction, means including a positioning-lever for determining in which direction the actuator shall be moved by the driver, a controller, connections between the controller and the actuator whereby the controller determines the position of the actuator independent of the positioning-lever, and connections between the controller and the rock-shaft whereby the controller may operate the cylinder-moving means, substantially as described.

35. The combination with a form-carrier and an inking mechanism, of an impression-cylinder, cylinder-moving means including a rock-shaft and suitable connections, a driver, a movable actuator, connections between the actuator and the rock-shaft, means whereby the driver operates the actuator to rock the shaft in either direction, means including a positioning-lever for determining in which direction the actuator shall be moved by the driver, a controller, connections between the controller and the actuator whereby the controller determines the position of the actuator independent of the positioning-lever, connections between the controller and the rock-shaft whereby the controller may operate the cylinder-moving means, and a locking device for said controller, substantially as described.

36. The combination with a form-carrier and an inking mechanism, of an impression-cylinder, cylinder-moving means including a rock-shaft and suitable connections, a movable actuator-bar, connections between said bar and the rock-shaft, a lever having oppositely-disposed shoulders for moving the bar in opposite directions, a cam-controlled positioning-lever for moving the bar into position to be struck by one of the shoulders, a spring for moving it into position to be struck by the other shoulder, a controller, and connections between the controller and the actuator-bar, substantially as described.

37. The combination with a form-carrier and an inking mechanism, of an impression-cylinder, cylinder-moving means including a rock-shaft and suitable connections, a movable ac-

tuator-bar, connections between said bar and the rock-shaft, a lever having oppositely-disposed shoulders for moving the bar in opposite directions, a cam-controlled positioning-lever for moving the bar into position to be struck by one of the shoulders, a spring for moving it into position to be struck by the other shoulder, a controller, connections between the controller and the actuator-bar, and a locking device for the controller, substantially as described.

38. The combination with a form-carrier and an inking mechanism, of an impression-cylinder, cylinder-moving means including a rock-shaft and suitable connections, a movable actuator-bar, connections between said bar and the rock-shaft, a lever having oppositely-disposed shoulders for moving the bar in opposite directions, a cam-controlled positioning-lever for moving the bar into position to be struck by one of the shoulders, a spring for moving it into position to be struck by the other shoulder, a controller, connections between the controller and the actuator-bar, connections between the controller and the rock-shaft, and a locking device for the controller, substantially as described.

39. The combination with the form-carrier and an inking mechanism, of an impression-cylinder, cylinder-moving means including a rock-shaft and suitable connections, an actuator-bar, connections between said bar and the rock-shaft, a driver-lever having oppositely-disposed shoulders for moving the actuator-bar in opposite directions, a cam moving with the impression-cylinder for operating the driver-lever, positioning devices including a cam moving with the impression-cylinder and a positioning-lever, a controller-bar, connections between said bar and the actuator-bar whereby the controller-bar may be moved independently of the positioning devices, and connections between the controller-bar and the rock-shaft, and a locking device for the controller-bar, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

JOSEPH WHITE.

Witnesses:

F. W. H. CRANE,
W. F. MORGAN.