

No. 676,241.

Patented June 11, 1901.

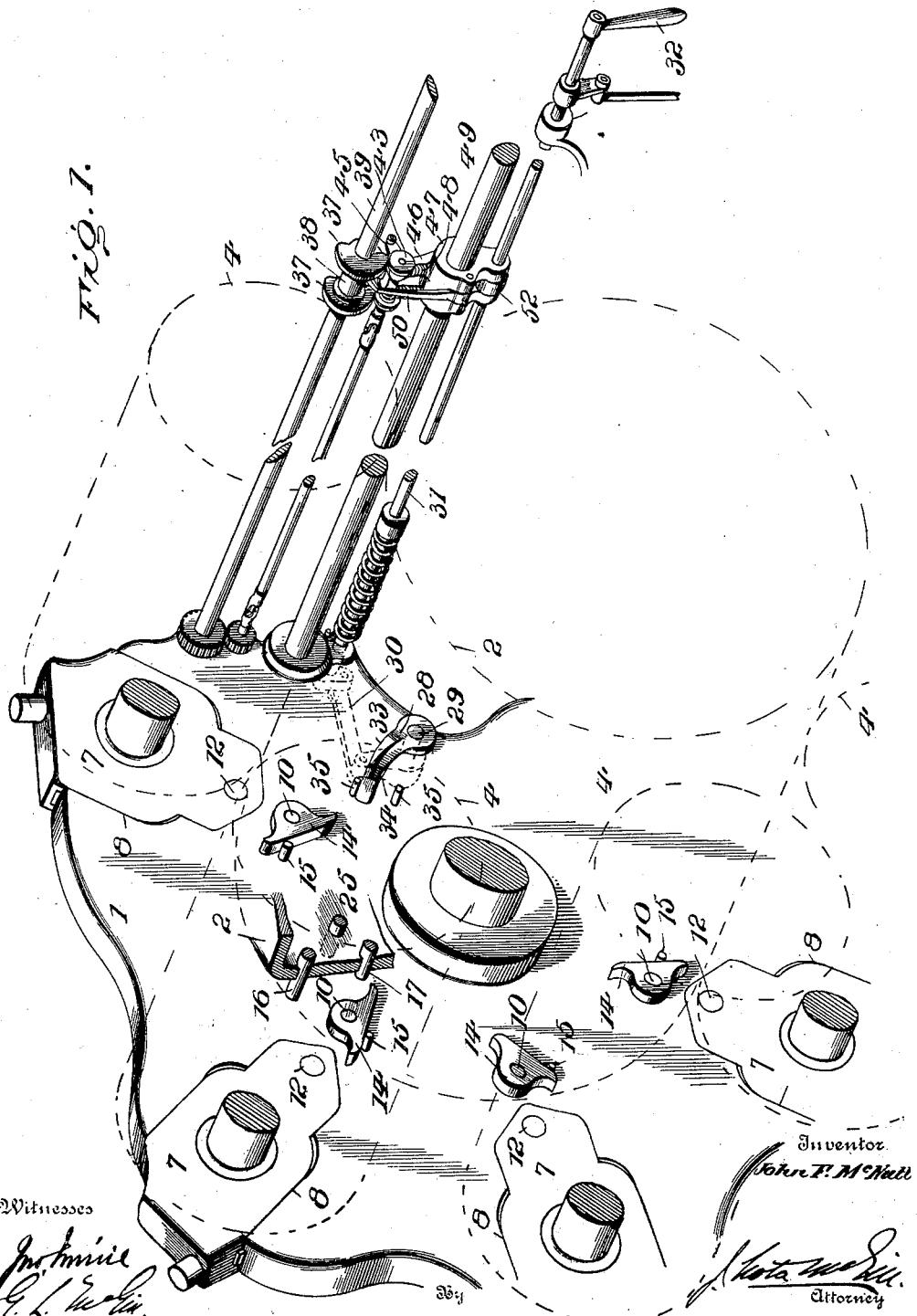
J. F. McNUTT.

PRINTING PRESS.

(No Model.)

4 Sheets—Sheet 1.

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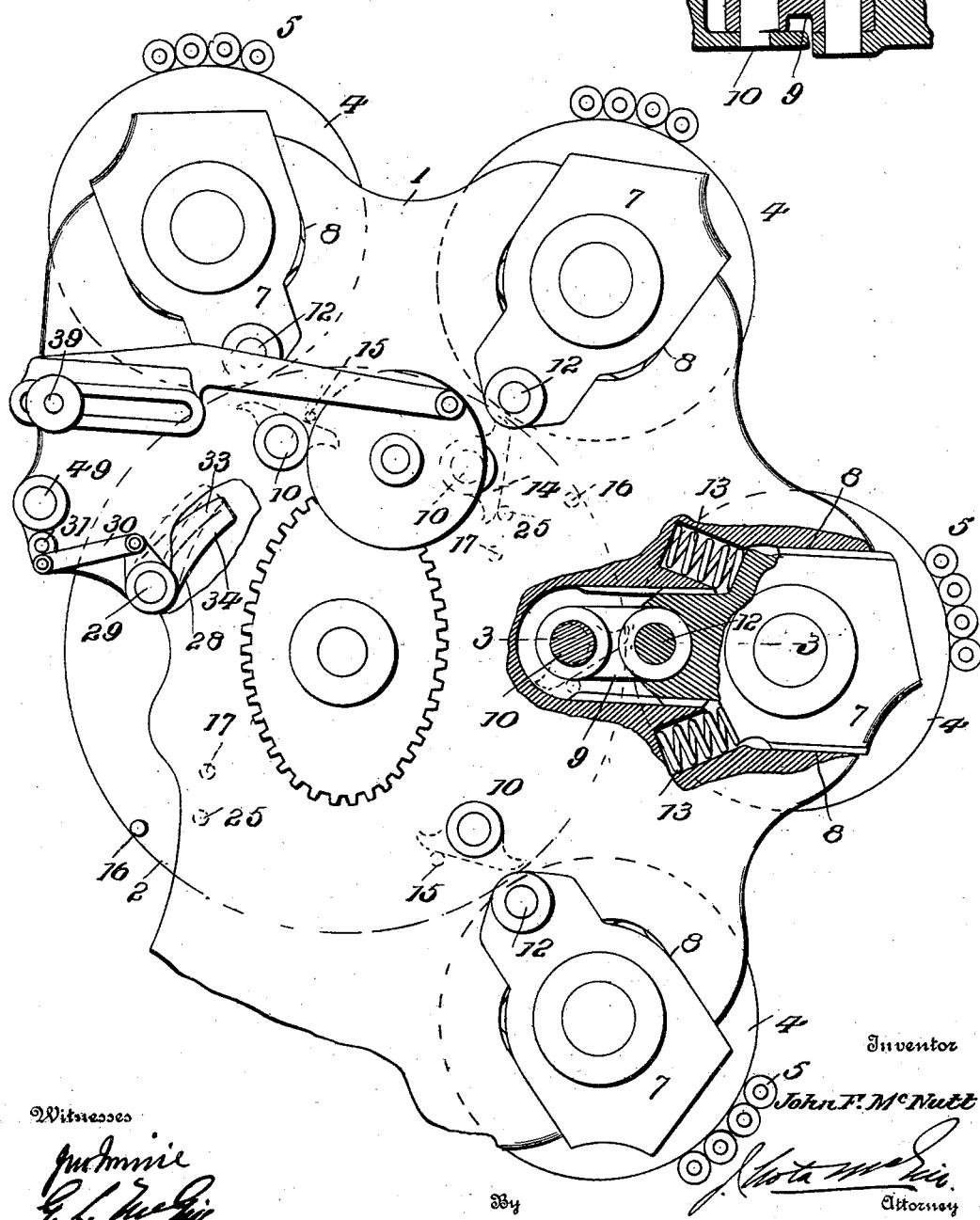
(Application filed July 25, 1900.)

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FIG. 3.

FIG. 2.



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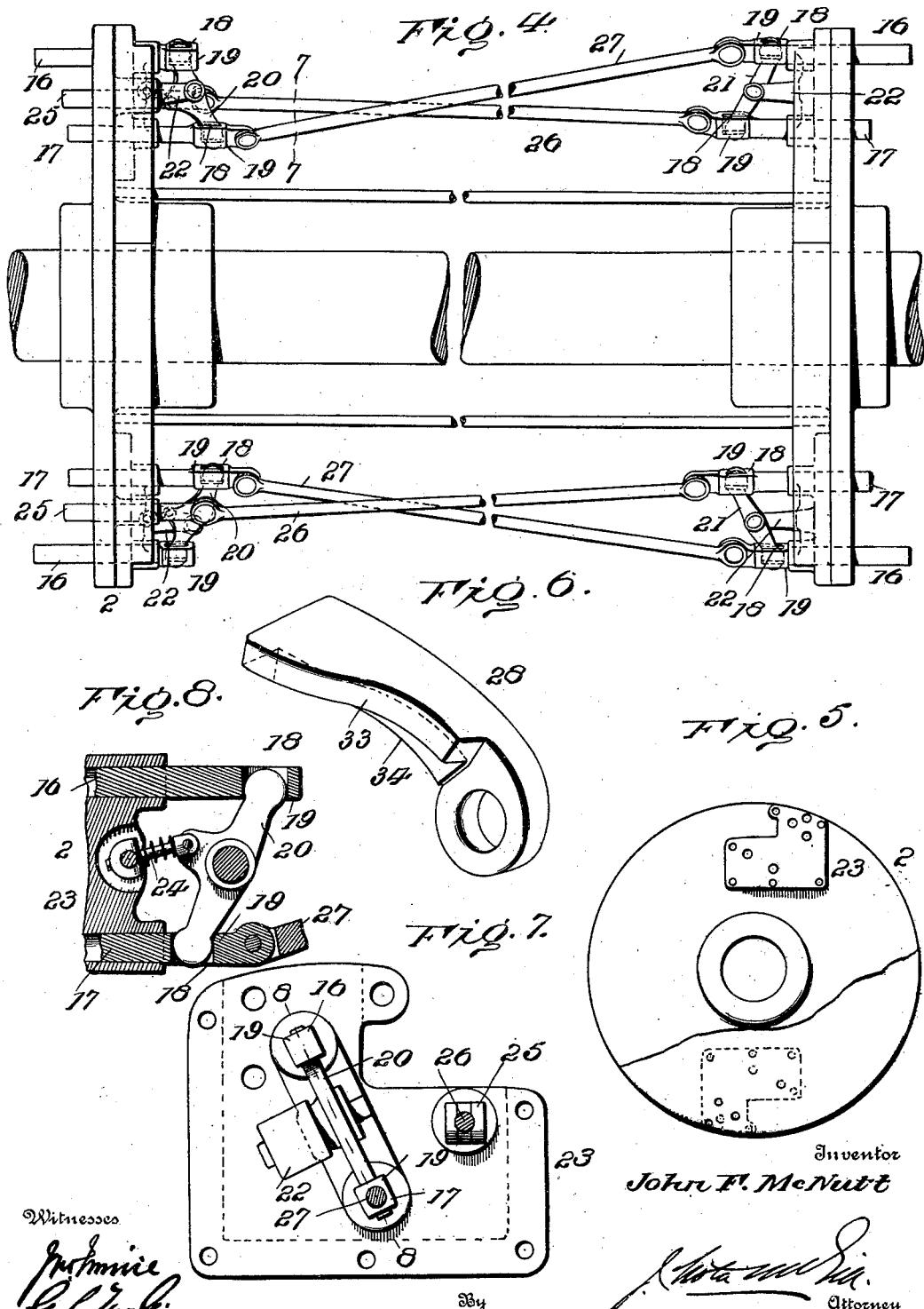
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(No Model.)

4 Sheets—Sheet 3.



Witnesses:

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UNITED STATES PATENT OFFICE.

JOHN F. MCNUTT, OF WARREN, OHIO.

PRINTING-PRESS.

SPECIFICATION forming part of Letters Patent No. 676,241, dated June 11, 1901.

Application filed July 25, 1900. Serial No. 24,780. (No model.)

To all whom it may concern:

Be it known that I, JOHN F. MCNUTT, of Warren, in the county of Trumbull and State of Ohio, have invented certain new and useful Improvements in Printing-Presses; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

10 This invention contemplates certain new and useful improvements in printing-presses, having reference primarily to that class of presses employing one main cylinder and a series of cylinders arranged in circular relation to and designed to coact with the main cylinder, as in multicolor-printing.

The primary object of the invention is to effect a relative adjustment between the main cylinder and the series of surrounding cylinders, to the end that they may be instantly thrown into or out of position for conjoint operation.

A further object is to automatically and successively effect the throw-off of the several cylinders upon an interruption in or a cessation of the feed-supply; and a further object is to provide an improved tripping device for actuating the throw-off mechanism in the event of any irregularity or interruption in the feed-supply.

The invention will be hereinafter fully set forth, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is 35 a view in perspective, with parts broken away and others omitted, looking inwardly from the rear at one side of the press-frame, the tripping device being shown and portions of the several cylinders indicated in dotted lines.

40 Fig. 2 is an end elevation with parts broken away and other parts omitted. Fig. 3 is a sectional view on line 33, Fig. 2. Fig. 4 shows the main or impression cylinder with its encircling casing removed. Fig. 5 is an end view of the cylinder with parts broken away, the interior mechanism being omitted. Fig.

45 Fig. 6 is a view of the switch. Fig. 7 is a sectional view on line 77, Fig. 4. Fig. 8 is a view on line 88, Fig. 7. Fig. 9 is a front view of the impression-cylinder, showing the tripping device, the latter being somewhat enlarged. Fig. 10 shows the tripping device and feed-

rolls in front elevation. Fig. 11 is a view looking at Fig. 10 on line 1111.

Referring to the drawings, 1 designates the 55 frame of a printing-press.

2 is the main or impression cylinder, suitably journaled in the sides of frame 1 and operated by mechanism not shown. Outside of and partially surrounding the cylinder 2 is 60 a series of circularly-arranged cylinders 4. These latter, which are smaller in diameter than the impression-cylinder, are designed to carry the type forms or plates, and each cylinder is provided with a separate set of ink- 65 rolls 5, as is required in multicolor-printing. These surrounding cylinders are journaled at their ends in boxes 7, each of which is movable in parallel guideways 8 in the sides of frame 1, thereby permitting of the longitudinal adjustment of each of the type-carrying cylinders and in consequence the adjustment of the several cylinders of the series 70 relatively to the main or impression cylinder.

Each box 7 is connected by a link 9 to an adjacent cam-shaft 10, journaled in the sides of the frame, such links being located in end extensions of the housings of the several boxes and formed with an eye in each end to accommodate, respectively, the cam-shaft 10 80 and a pin 12, by which it is loosely held to the inner end of its respective box. The partial turning of the several cam-shafts will throw each of the type-carrying cylinders into or out of working position in relation to the 85 impression-cylinder. Coil-springs 13 act on each box to insure evenness of movement and prevent jarring. On the inner end of each cam-shaft is a tumbler 14, formed with curved ends. Adjacent to each tumbler is a stop 15 90 to limit its movements to a partial rotation.

The impression-cylinder 2 carries mechanism for actuating the several tumblers, so as to throw in or out the several type-carrying cylinders. Such mechanism is shown as embracing longitudinally-movable bolts 16 and 17, projecting through the ends of the cylinder into the path of the curved ends of the several tumblers, the engagement of such bolts with the tumblers being controlled according as it is desired to throw off or throw in the several type-carrying cylinders, one bolt being withdrawn when the other is projected so as to engage the tumblers. The

tumbler-actuating mechanism is duplicated at diametrically opposite sides of the impression-cylinder for the reason that two sacks are usually printed in each revolution of the cylinder. The bolts 16 and 17 at their inner ends within the cylinder are formed with slots 18 in box-like portions 19, in which slots of the two sets of bolts fit the ends of levers 20 and 21, fulcrumed on posts 22, projected from plates 23, secured to the end heads of the cylinder. To the lever 20 is secured a spring-pressed rod 24 for holding the parts fixed in the positions into which they are positively moved. Looking at Fig. 4, the two sets of actuating mechanism are operated from the left-hand end—that is, movements at this end are communicated to the bolts at the other or right-hand end of the cylinder. At this operating end, on a line between but to one side of the bolts 16 and 17, is a supplemental bolt 25. This bolt at its inner end is connected by a rod 26 to the inner end of the bolt 17 at the other end of the cylinder, while to the coacting bolt 16 at this end is connected a rod 27, which leads from the bolt 17 at the operating end. When bolt 17 at the left is forced inward, the corresponding bolt 17 at the other end is likewise moved, while the outer bolt 16 at each end is projected outward, as is also the supplemental bolt 25, the movements of the bolts 17 and 25 at the operating end being communicated to the bolts 16 and 17 at the other end through the connecting cross-rods and the levers 20 and 21, the former controlling the movement also of the bolt 16 at the left of the cylinder. When the two bolts 17 at the opposite ends are forced in, the two bolts 16 and the supplemental bolt 25 are forced out, while when the two bolts 17 are projected outwardly the previously-extended bolts 16 and 25 are drawn inward. The first-described position occurs when the press is set for throwing in the series of type-cylinders, while the second-described movement will result in throwing off the impressions—that is, moving the type-cylinders away from the impression-cylinder. 28 is a switch mounted between the impression-cylinder and the press-frame on the inner end of a short shaft 29, carried through the frame and connected by a link 30 to a spring-actuated rod 31. This rod is extended across the frame in front of the impression-cylinder and is provided with a handle 32, by which it is turned to set the switch for throwing in the type-carrying cylinders. The switch is formed with two cam-surfaces 33 and 34, with which will engage the inner bolt 17 or the supplemental bolt 25, according as the switch is positioned to throw the type-carrying cylinders into or out of operation. For the throw-in the switch occupies its lower position—that is, toward the axial center of the impression-cylinder—while for effecting the throw-off the switch is raised toward the periphery of the cylinder. These movements of the switch are limited by stops 35.

36 is the feed mechanism and tripping device. It comprises two upper feed-rolls 37, having segmental contact peripheries. These 70 rolls are on a sleeve 38, fast on a shaft 39, mounted at its ends in the sides of the press-frame and driven from one end by suitable mechanism. Between two ears 40 of sleeve 38 is pivoted a trip-arm 41, which projects 75 forward of the contact portion of the feed-rolls 37, and by engaging with a stop 42 said arm will in the revolution of the rolls intersect the line of travel of the stock to the press. The lower feed-rolls 43 are fast on a 80 shaft 44, which is supported by two links 45, loosely hung on a cross-pin 45^a, projected laterally from a post 46 of a casting 47. Two coil-springs 48 serve to hold the lower feed-rolls in proper position relative to the upper 85 feed-rolls and allow for any inequality in the thickness of the stock, the upward movement of the links being limited by stops 48^a. The shaft 44 is formed in sections connected together by flexible joints and is driven by 90 the shaft 39 of the upper feed-rolls, said shaft having intermeshing gear-wheels at one end. The casting 47 is fast on a tie-rod 49, held at its ends to the sides of the press-frame. Within this casting is fulcrumed a lever 50, 95 having in its forwardly-projected arm a shoulder 51, which is designed to engage and hold a dog 52 fast on the spring-actuated rod 31 when the latter is turned to position its switch to insure the throwing in of the type-cylinders. The engagement of the lever 50 with the dog 52 is insured by a spring 53 bearing downwardly on its forwardly-projected arm. The upright arm of this trip-lever extends to the line of passage of the stock, so as to be 100 engaged by the trip-arm 41 if the latter be not raised sufficient to clear the end of the lever, as when the stock is not in position at the proper time between the upper and lower feed-rolls. When this occurs, the trip-arm 41 105 will engage trip-lever 50, turning the latter on its fulcrum and freeing the dog 52, whereupon the spring-actuated rod 31 will throw the switch outward into the path of travel of the then extended bolts 25, which upon coming in contact therewith will be forced inwardly, resulting in the withdrawal of the bolts 16 and the forcing out of bolts 17. The latter will then act consecutively on the several tumblers and effect the outward movement of the boxes of the type-cylinders. 110

In practice the operator first sets rod 31 as against the tension of its spring, placing dog 52 in engagement with the trip-lever. The switch being thus thrown inward, the bolts 12 17 will be forced in the cylinder, while the bolts 16 and 25 will be projected outward, and upon the former coming in contact with the tumblers of the type-cylinders will act thereon to throw the latter into working position 13 relatively to the impression-cylinder. The stock is brought up to the feed-rolls by any suitable means, and at the proper time such rolls, which are intermittently operated, will

take up one article and feed it forward to the impression-cylinder. As the article travels forward the trip-arm comes in contact therewith and is thereby turned on its pivot sufficiently far to clear the trip-lever. The parts will continue to retain the position stated as long as the proper feed to the press is maintained; but upon any interruption therein or failure to properly position the stock between the feed-rolls the trip-arm will engage the trip-lever, releasing the switch-shaft, which will throw its switch into its upper position in the path of travel of the supplemental bolts 25. These being forced inward, the bolts 16 will be withdrawn and the bolts 17 forced out, so that they will contact with the several tumblers and effect the successive throw-off of the type-carrying cylinders.

20 By the means described upon failure in the feed-supply the type-cylinders are successively thrown off; but stock passing through the press when such failure occurs will be fully printed before the throw-off of all the type-cylinders is accomplished. Likewise when the action is reversed the successive throw-in of the several type-cylinders is timed to occur with the presence of stock to receive the several imprints—that is, the actuating mechanism occupies such relation to the position of the stock on the impression-cylinder that each of the type-cylinders is thrown into position in time to coact with the impression-cylinder. In this way no impression will be made upon the tympan-sheet, the throw-off or throw-in of each cylinder occurring according as stock is absent or present.

I claim as my invention—

1. A printing-press having a main cylinder, a plurality of cylinders circularly arranged relatively to the main cylinder and means for automatically effecting a relative adjustment of positions between said main cylinder and the plurality of cylinders according as stock is absent or present at the time for its action.

2. A printing-press having a main cylinder, a plurality of cylinders circularly arranged relatively to the main cylinder, means for effecting a relative adjustment of positions between said main cylinder and the plurality of cylinders, and means for automatically operating the former means upon an interruption in the feed-supply.

3. A printing-press having a main cylinder, a plurality of cylinders circularly arranged relatively to the main cylinder, means for effecting a relative adjustment of positions between said main cylinder and the plurality of cylinders, and a tripping device, for effecting the operation of said means, designed to be actuated upon an interruption in the feed-supply.

4. The combination, in a printing-press, having an impression-cylinder, of a series of type-cylinders arranged in circular relation to said impression-cylinder, mechanism controlling the position of each type-cylinder rela-

tive to the impression-cylinder, and means for successively operating said mechanism for effecting the throw-off or throw-in of each of said type-cylinders according as stock is absent or present at the time for its action.

5. The combination, in a printing-press, of two cylinders, means for effecting a relative adjustment of positions between said cylinders, means carried by one cylinder for operating the adjusting means and shiftable means for actuating the operating means.

6. The combination, in a printing-press, of two cylinders, means for effecting a relative adjustment of positions between said cylinders, means for operating the adjusting means movable synchronously with one of said cylinders, and means for automatically actuating said operating means upon an interruption of the feed-supply.

7. The combination, in a printing-press, of two cylinders, means for effecting a relative adjustment of positions between said cylinders, means carried by one cylinder for operating the adjusting means, and means for automatically actuating said operating means upon an interruption of the feed-supply.

8. The combination, in a printing-press having an impression-cylinder, of a series of type-cylinders arranged in circular relation to said impression-cylinder, throw-off mechanism for each of said type-cylinders, and means carried by the impression-cylinder for actuating the throw-off mechanism of the several type-cylinders according as stock is absent or present at the time for its action, substantially as set forth.

9. The combination, in a printing-press having an impression-cylinder, of a series of type-cylinders arranged in circular relation to said impression-cylinder, throw-off mechanism for each of said type-cylinders, means carried by the impression-cylinder for actuating the throw-off mechanism of the several type-cylinders, and trip mechanism for operating said means upon an interruption in the feed-supply, substantially as set forth.

10. The combination, in a printing-press, of an impression-cylinder, a plurality of type-cylinders arranged in circular relation to the impression-cylinder, movable bearings for each of the plurality of cylinders, means for moving said bearings for throwing said cylinders in or out of operative position relatively to the impression-cylinder, and means carried by the latter for operating the former means according as stock is absent or present at the time for its action.

11. The combination, in a printing-press, of an impression-cylinder, a plurality of type-cylinders arranged in circular relation to the impression-cylinder, movable bearings for each of the type-cylinders, cam-shafts to which the bearings are connected, tumblers on said cam-shafts, and means carried by the impression-cylinder for engaging said tumblers, as set forth.

12. The combination, in a printing-press, of

an impression-cylinder, a plurality of type-cylinders arranged in circular relation to the impression-cylinder, movable bearings for each of the type-cylinders, links connected to said bearings, cam-shafts engaging said links, tumblers on said cam-shafts, and means carried by the impression-cylinder for operating said tumblers.

13. The combination, in a printing-press, of an impression-cylinder, a plurality of type-cylinders arranged in circular relation to the impression-cylinder, throw-off mechanism for each of the type-cylinders, means carried by the impression-cylinder for successively actuating the throw-off mechanism of each type-cylinder, and a tripping device for controlling said actuating means, as set forth.

14. The combination, in a printing-press, of an impression-cylinder, a plurality of type-cylinders arranged in circular relation to the impression-cylinder, movable bearings for each of the type-cylinders, cam-shafts to which said bearings are connected, tumblers on said cam-shafts, shiftable projections carried by the impression-cylinder for engaging said tumblers, and means for controlling said projections, substantially as set forth.

15. The combination, in a printing-press, of an impression-cylinder, a plurality of type-cylinders arranged in circular relation to the impression-cylinder, throw-off mechanism for each of the type-cylinders comprising shafts having tumblers, shiftable bolts carried by the impression-cylinder designed to alternately engage the said tumblers, and means for simultaneously projecting one bolt and withdrawing a second bolt, substantially as set forth.

16. The combination, in a printing-press, of an impression-cylinder, a plurality of type-cylinders arranged in circular relation to the impression-cylinder, throw-off mechanism for each of the type-cylinders comprising shafts having tumblers, and means carried by the impression-cylinder for alternately moving each tumbler in opposite directions comprising, shiftable bolts projected through the ends of the cylinder, connections between the bolts at opposite ends, and means for actuating said bolts, substantially as set forth.

17. The combination, in a printing-press having an impression-cylinder, of a series of type-cylinders, throw-off mechanism for each type-cylinder comprising shafts and tumblers thereon, and means carried by the impression-cylinder for actuating the throw-off mechanism of the several type-cylinders comprising bolts at the ends of the cylinder for engaging the tumblers, levers engaging said bolts; a supplemental bolt at the operating end of the impression-cylinder, connections between the latter and an adjacent bolt with the bolts at the other end of the cylinder, and a switch with which the supplemental bolt and said adjacent bolt are designed to engage, substantially as set forth.

18. The combination, in a printing-press

having an impression-cylinder, of a series of type-cylinders, throw-off mechanism for each type-cylinder comprising shafts and tumblers thereon, and means carried by the impression-cylinder for actuating the throw-off mechanism of the several type-cylinders comprising bolts at the ends of the cylinder for engaging the tumblers, levers engaging said bolts, a supplemental bolt at the operating end of the impression-cylinder, a rod connecting said supplemental bolt to one of the bolts at the other end, and a second rod connecting the other bolt at this latter end with one of the bolts at the operating end, and a switch with which the latter bolt and the supplemental bolt are designed to engage, substantially as set forth.

19. In a printing-press, the combination with an impression-cylinder and a plurality of type-carrying cylinders having shiftable bearings, of means for moving said bearings, a switch for actuating said means, a trip for normally holding said switch, a rotary shaft and an arm carried thereby designed to engage said trip upon an interruption in the feed-supply, substantially as set forth.

20. The combination, in a printing-press, of an impression-cylinder, a plurality of type-cylinders arranged in circular relation to the impression-cylinder, throw-off mechanism for each of said type-cylinders, means for operating the throw-off mechanism comprising a spring-actuated rod, a trip-lever normally holding said rod, and means for actuating said trip-lever upon any interruption in the feed-supply, substantially as set forth.

21. In a printing-press having an impression-cylinder and one or more type-cylinders, throw-off mechanism for each of the latter, feeding and tripping mechanism comprising two sets of feed-rolls, a trip-lever projected into the path of travel of the feed-supply, and a trip-arm carried by one set of feed-rolls for engaging with said trip-lever upon an interruption in the feed-supply, substantially as set forth.

22. In a printing-press having an impression-cylinder and one or more type-cylinders, throw-off mechanism for each of the latter, means for actuating the throw-off mechanism, a switch controlling said means, a spring-actuated rod carrying said switch, a trip-lever normally holding said rod, a trip-arm for engaging said trip-lever, feed-rolls, and means for moving said trip-arm across the path of travel of the feed-supply, said trip-arm being normally held out of engagement with the trip-lever by the stock being fed to the press.

23. In a printing-press having an impression-cylinder and one or more type-cylinders, throw-off mechanism for each of the latter, means for actuating the throw-off mechanism, a switch controlling said means, a spring-actuated rod carrying said switch, a trip-lever normally holding said rod, a trip-arm for engaging said trip-lever, upper and lower feed-rolls, said trip-arm being carried by said up-

per feed-rolls, and means for operating said feed-rolls, substantially as set forth.

24. The combination, in a printing-press having throw-off mechanism and means for operating the same, a switch, a spring-actuated rod carrying the latter, a dog on said rod, a stationary casting, a trip-lever mounted thereon having a shoulder engaging said dog, the upper end of said lever being extended to the line of feed to the press, upper and lower feed-rolls, a trip-arm carried by said upper feed-rolls and designed to engage said trip-

lever, and a stop to limit the movement of said trip-arm, the trip-arm being held out of engagement with the trip-lever by the stock 15 being fed to the press, substantially as set forth.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

JOHN F. McNUTT.

Witnesses:

W. H. SMILEY,
W. J. BURT.