

(No Model.)

2 Sheets—Sheet 1.

J. BROOKS.

INKING MECHANISM FOR PRINTING PRESSES.

No. 455,385.

Patented July 7, 1891.

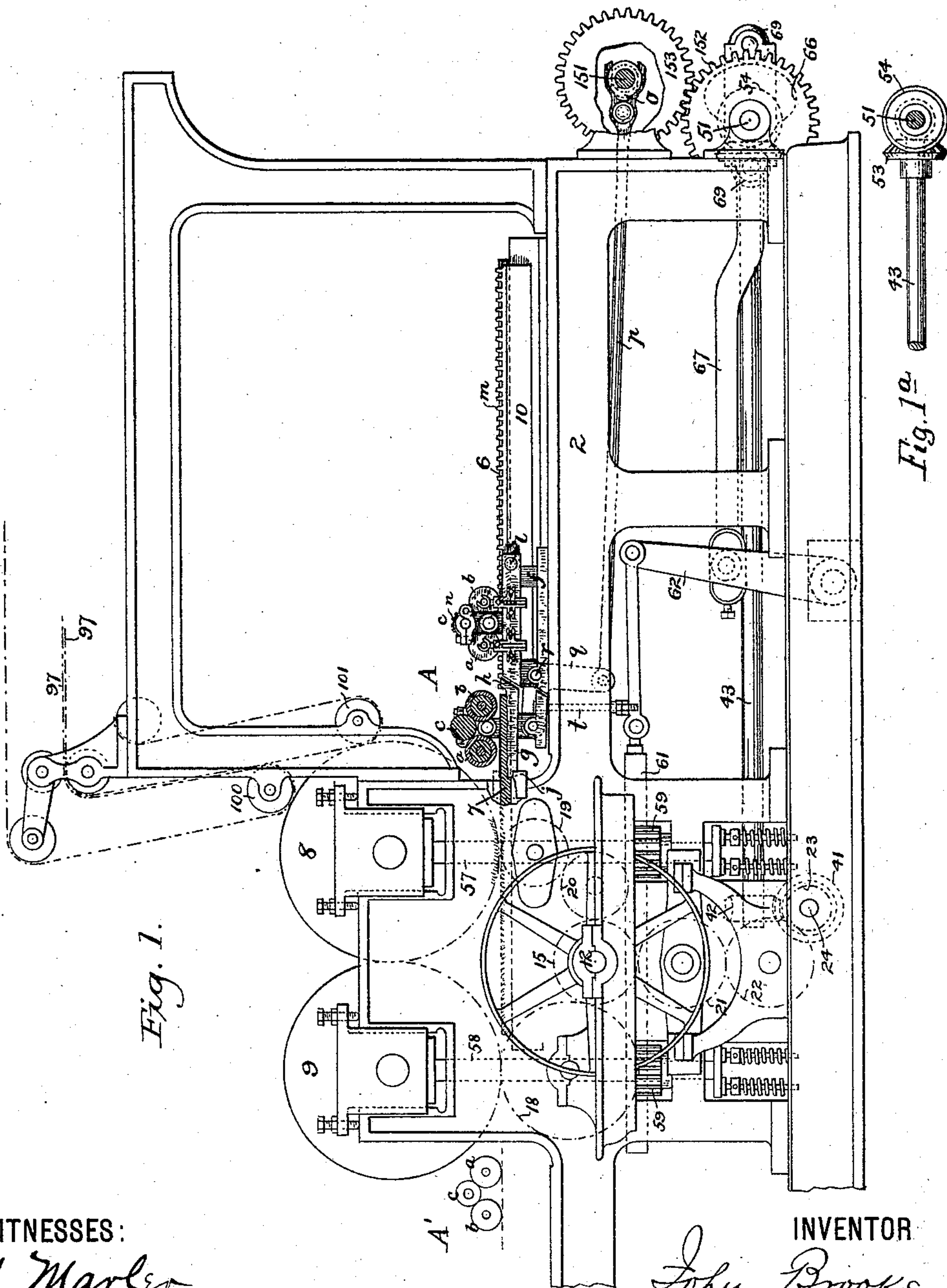


Fig. 1.

Fig. 1a.

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Fig. 3.

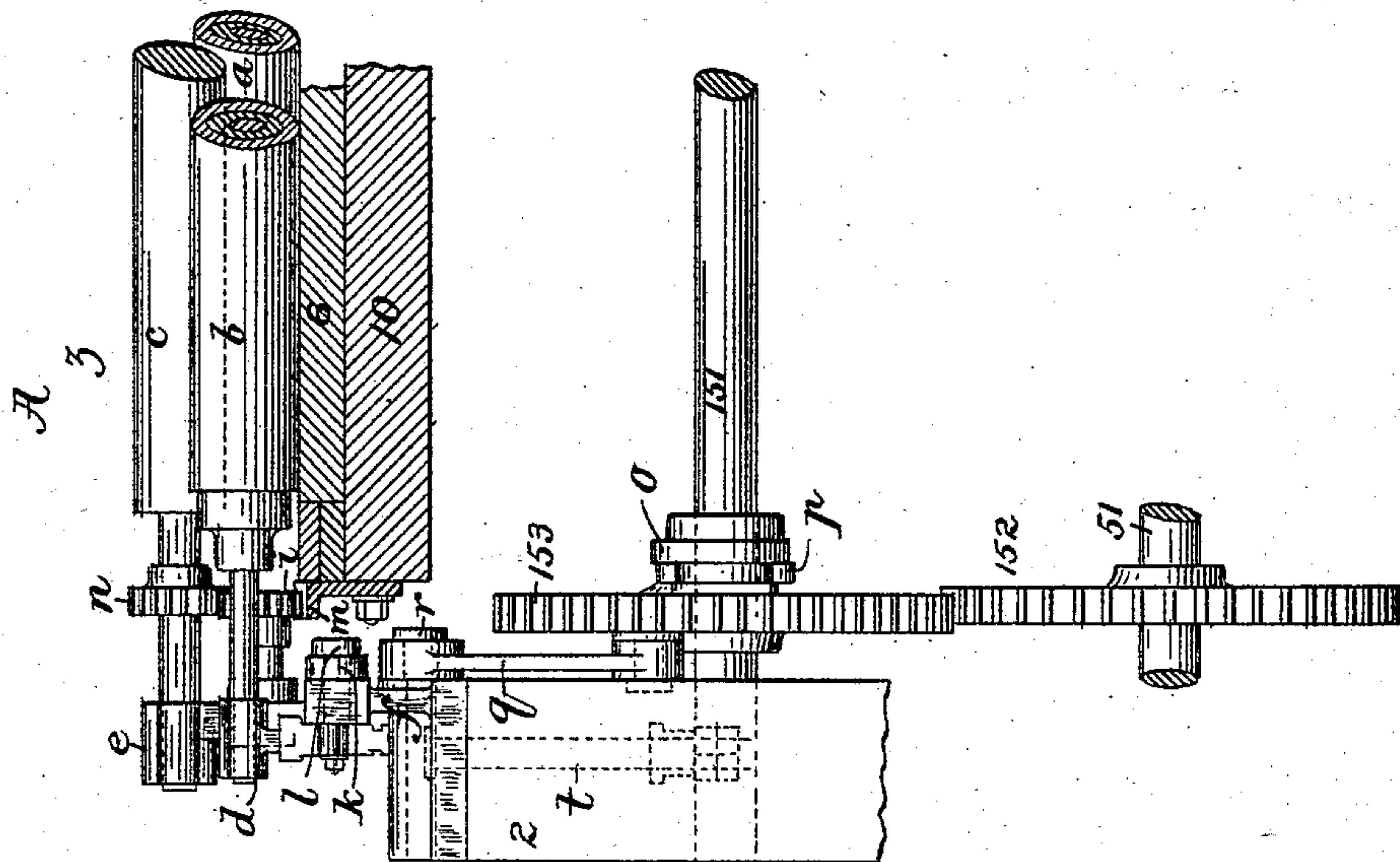


Fig. 2.

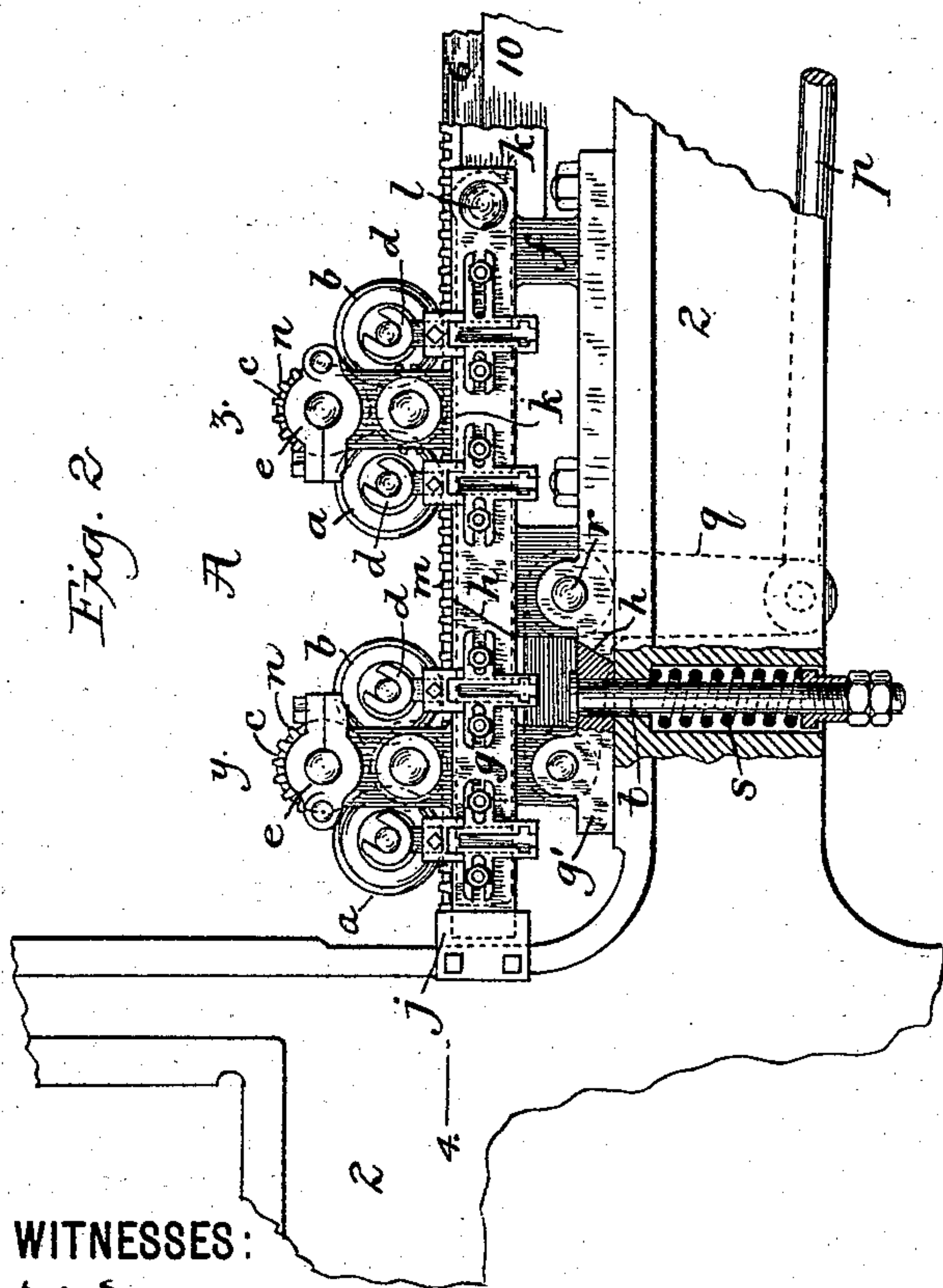
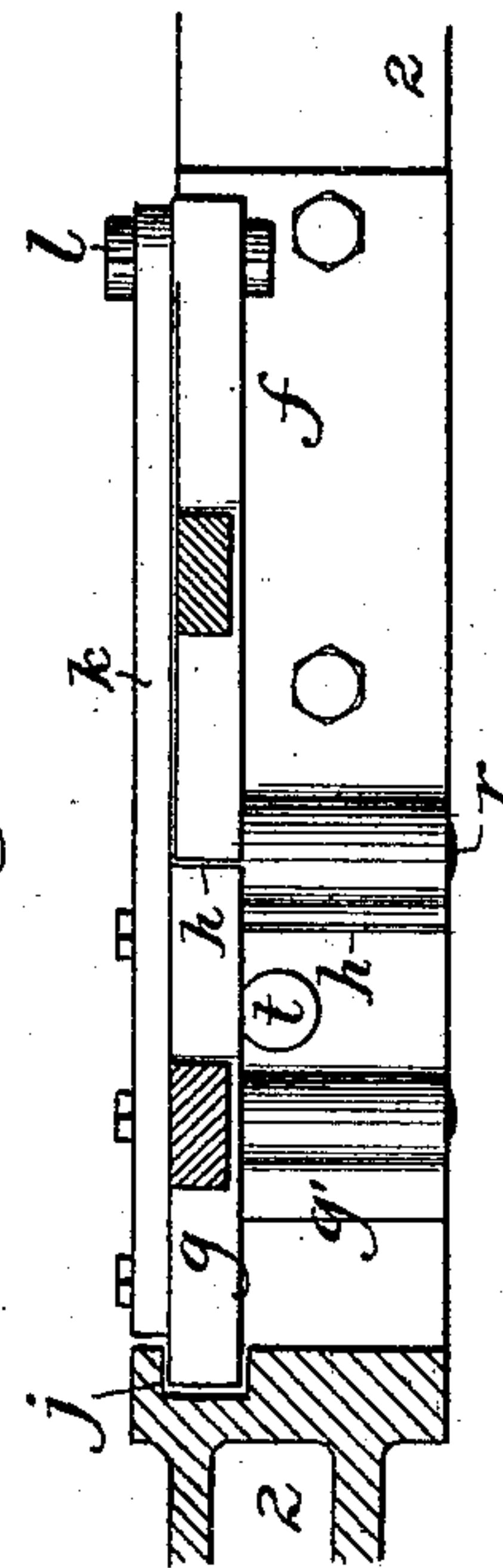


Fig. 4.



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UNITED STATES PATENT OFFICE.

JOHN BROOKS, OF PLAINFIELD, NEW JERSEY.

INKING MECHANISM FOR PRINTING-PRESSES.

SPECIFICATION forming part of Letters Patent No. 455,385, dated July 7, 1891.

Application filed October 9, 1890. Serial No. 367,476. (No model.)

To all whom it may concern:

Be it known that I, JOHN BROOKS, a citizen of the United States, residing at Plainfield, county of Union, and State of New Jersey, have invented certain new and useful Improvements in Inking Mechanism for Printing-Presses, of which the following is a specification.

This invention relates generally to cylinder printing-presses, and more particularly to that class of such presses known as "double-cylinder" or "perfecting" presses—that is to say, wherein the sheet is printed upon both sides or perfected by means of two impression-cylinders and a form-bed carrying two forms, one for each side of the sheet. In this class of presses, with one exception, it is common to employ two sets of ink-distributing rolls set immediately in advance of each cylinder, so that the forms in the reciprocation of the bed are inked in both the to-and-fro movement thereof, the first form, coacting with the first impression-cylinder, being inked by the two sets of rolls adjacent thereto, and the second form, coacting with the second impression-cylinder, being likewise inked by the other two sets of rolls adjacent to that cylinder. In this operation the bed is required to be reciprocated a distance in either direction to effect the complete printing of the sheet and so that the foremost form shall pass in contact with the two sets of ink-rolls; and hitherto the succeeding form has also passed in contact with one of said sets of rolls. This results in unduly inking one portion of each form, so that that portion necessarily prints heavier than the rest of the form. Besides this defect in the resulting impression, the partial inking of the succeeding form is especially disadvantageous where two different kinds or qualities of ink are used, one kind or quality for one form inked by the two sets of ink-rolls arranged upon one side of the cylinders and another kind or quality for the other form inked by the other two sets of rolls arranged upon the opposite side of the cylinders. In the one method of curing this defect it has been proposed to mount the movable ink-rolls in pivoted bearings, with which coact lifting-cams arranged on the side of the form-bed. The present invention, however, to obviate this partial ink-

ing of the succeeding form, consists in mounting one set of each of the two sets of ink-rolls movable with respect to their plane of contact with the forms and independent of the form-bed, so that the rolls of both sets may ink the foremost form, as usual; but the movable set will be raised at the proper time to be wholly out of inking contact with the succeeding form as it passes beneath them in the to-and-fro reciprocation of the bed.

As a better understanding thereof will be had by a detailed description of a practical embodiment of the invention, such description will now be given, reference being had to the accompanying drawings, illustrating the same, in which—

Figure 1 is a side elevation of so much of a double-cylinder printing-press as is necessary to illustrate the improvement as applied thereto, certain parts being in section for perspicuity's sake. Fig. 1^a is a detached view of the means for driving the cross-shaft from the longitudinal shaft. Fig. 2 is an enlarged elevation of the two sets of ink-distributing rolls as arranged upon one side of the impression-cylinders. Fig. 3 is an end elevation of the same, showing a portion only of the machine and the bed in section. Fig. 4 is a sectional plan view on the line 4 of Fig. 2 of the two ink-roll frames, the rolls and their bearings being omitted.

It is to be understood that, as usual in this class of presses, there are two sets of ink-distributing rolls A A' arranged upon opposite sides of the impression-cylinders, and as the construction and operation of each of said two sets of rolls are the same only the two sets A are fully illustrated, and will be hereinafter described, the other two sets A' upon the opposite side of the impression-cylinders being merely indicated by the outline of the inner set of the two. A description, therefore, of the two sets A will suffice for both.

The particular type and construction of press illustrated are those fully set forth in United States Letters Patent No. 413,491, granted to me October 22, 1889, and like parts of the press of said patent, so far as there is any need to illustrate and describe them herein, will be lettered, numbered, and designated the same.

The machine as illustrated herein and in

said patent consists of the first and second impression-cylinders 8 9, respectively, suitably mounted in the side frames 2 of the machine. With these impression-cylinders there
 5 coacts a reciprocating bed 10, having two forms 6 7 secured thereto. The impression-cylinders are each driven from a driving-pin-
 10 ion 15, secured to the shaft 12, the first impression-cylinder through intermediate gears 20 and 19 and the second impression-cylinder through the intermediate gear 18. These im-
 pression-cylinders are alternately raised and lowered into and from the plane of impression by means of a pair of pinion-nuts 59, which
 15 engage, respectively, with the vertical rods 57 and 58, extending upward to the under side of the boxes of each cylinder. The pinions of the nuts 59 are rotated through the recip-
 20 rotation of a rack 61, that is moved by the rotation of a cam 66, mounted upon a cross-shaft 51 at one end of the machine through
 rolls 69 at one end of a connecting-rod 67, the opposite end of which is connected to a lever
 25 62, that is in turn connected with said reciprocating rack 61. Suitable motion is im-
 parted to said cross-shaft 51 and the cam 66 from the driving-pinion 51 through interme-
 diates 21, 22, and 23, the latter of which is fast to a cross-shaft 24, that is provided with
 30 a worm 41, in engagement with the worm-wheel 42 on the end of the longitudinal shaft 43. The opposite end of this longitudinal shaft 43 is provided with a bevel-gear 53, (see
 detached view, Fig. 1^a.) that in turn meshes
 35 with a similar wheel 54 upon the cross-shaft 51, the connection being such that said cross-shaft makes one turn to two turns of the cyl-
 40 inders. The sheets of paper may be fed to the first impression-cylinder 8 in any of the usual
 modes, either from a feed-board or from a receiving-cylinder, or, as shown, by a series of
 tapes 97, that are mounted, as shown in said patent, and return over the pulley 100 and 101.
 The sheets thus presented to the impression-
 45 cylinder will be taken by said cylinder in the usual manner, so that they will be brought
 in contact with the form 6 of the reciprocating bed and will be transferred to and be
 taken by the second impression-cylinder and
 50 be by it brought in contact with the second form 7 of the reciprocating bed, and be thence
 delivered in any of the usual modes, either by tapes to a fly or to a delivery-cylinder and
 thence to a fly or a folding machine or directly
 55 to a folding-machine, neither of which is herein shown.

The two sets of ink-distributing rolls A are adapted in the present machine to coact wholly with one of the forms—as, for instance, the
 60 form 6, with which the first impression-cylinder 8 coacts. The rolls of each of these sets are of the usual number and mounted in the usual way. Thus each set *y* and *z* consist of
 a pair of ink-rolls *a b*, adapted to revolve in
 65 contact with the form as it moves to and fro under them and an intermediate roll *c* above
 the rolls *a b* and in surface contact with both

of them. The rolls *a b* are held in open jour-
 nals *d*, and the rolls *c* in a closed journal *e*. Positive motion is imparted to the upper roll, 70
 and thence by frictional contact to the rolls
a b by means of an intermediate driving-pin-
 ion *i*, that meshes with the horizontal rack *m*,
 secured to the side of the bed, and with a pin-
 ion *n*, fast to the shaft of the roll *c*. The sev- 75
 eral rolls *a b c* of the set *z*—the outer set—are
 mounted and supported in a fixed frame *f*,
 securely bolted to the top of the side frame 2,
 so that the ink-rolls *a b* are in constant posi-
 tion to bear upon the form as it reciprocates 80
 to and fro under them. The rolls of the set
y—the inner set—are mounted in a movable
 frame *g*, adapted to be raised sufficiently so
 as to take the rolls *a b* out of the plane of
 contact with the form, so that as the succeed- 85
 ing form (which in this side of the press is the
 form 7) in passing under them will not be
 inked thereby.

The movable frame *g* consists of two hori-
 zontal portions *g* and *g'*, the latter or lower 90
 portion of which is in position to rest upon
 the top of the side frame and both portions
 in alignment with similar portions of the
 frame *f* of the outer set *z*. The abutting ends
 of each of the portions of the frames are 95
 beveled on a line *h* to increase said abutting
 surface and to hold the movable frame more
 rigid. The opposite or inner end of one por-
 tion of the frame—namely, its upper hori-
 zontal portion—is let into a guide *j*, formed or 100
 secured to a vertical portion of the side frames,
 so that that end is positively guided in the
 vertical movements thereof. The movable
 frame *g* is pivotally connected to the fixed
 frame *f* by means of a bar *k*, extending from 105
 the rear side of the frame *g* to the outer end
 of the frame *f* by a bolt *l*, the bar *k*, thus
 extending the length of the fixed frame, and
 substantially in contact therewith, thereby
 bracing and steadying the movable frame lat- 110
 erally, and its pivot being located at the
 farthest end of the fixed frame increases
 the arc of movement of the movable frame,
 whereby its two ink-rolls *a b* are raised about
 an equal distance above the form. Suit- 115
 able and timely motion is imparted to the
 frame *g* and the ink-rolls supported thereby
 through connections with the cross-shaft 151,
 mounted in suitable bearings at the end of
 the machine-frame and above the cross-shaft 120
 51, the said two cross-shafts being provided
 with intermeshing gear-wheels 152 153, by
 which the shaft 151 is rotated in unison with
 the shaft 51. The shaft 151 carries a cam *o*, act-
 ing upon a roll carried by the outer end of a 125
 rod *p*, the inner end of which is connected to
 one arm of a bell-crank *q*, that is mounted to
 rock upon a stud *r*, held by the fixed frame
f, the opposite end of which bell-crank is con-
 nected with the movable frame *g*. The roll 130
 of the connecting-rod *p* is held to duty against
 the cam, and the movable frame is brought to
 its seat upon the top of the side frame after
 each action of the cam by means of a spring

s, coiled around a pin *t*, extending from the lower portion *g'* of the movable frame down through an opening in the side frame and provided at its lower end with suitable check-nuts for regulating the tension of the spring.

Of course it is to be understood that the frames *f* and *g* are duplicated upon the opposite end of the rolls on the other side of the machine-frame, and that the cam *o* will be duplicated at the other end of the shaft 151, so that the mate to the movable frame *g* and the ink-rolls will be raised and lowered bodily and equally at both ends to and from their plane of contact with the form.

In the operation of the inking mechanism described the reciprocating bed is shown in Fig. 1 in its outward position, the form 7 just having completed the printing of the second side of the sheet in conjunction with the second impression-cylinder 9. As soon as the foremost form 6 passes beyond the inner set of ink-rolls *y* the cam *o* will operate to lift said ink-rolls and their frames bodily from the position shown in Fig. 2 into the position shown in Fig. 1, so that the foremost portion of the succeeding form 7 will not be inked thereby, and upon the return reciprocation of the bed as soon as this end of the succeeding form 7 passes beyond the inner set of rolls *y* they will drop bodily, so as to be in the plane of contact with the form 6, as in Fig. 2, when the operations will be repeated upon the opposite side of the impression-cylinders, the two sets of rolls of the set *A'* moving in contact with the form 7 and the inner set being raised as soon as the then forward end of the succeeding form 6 reaches them, so that it will not be inked thereby. The mechanism for automatically raising the inner set of ink-rolls of the two sets *A'* may be a duplicate of that shown for raising the inner set *y* of the two sets of rolls *A*.

It is to be remarked that the extent to which the rolls of the movable set are raised need not be sufficient to take the teeth of the intermediate pinion *i* out of gear with the teeth of the bed-rack *m*, and that while two independent sets of ink-rolls are employed with each form, one of the sets being movable out of inking contact with the other form, both of said sets may obviously be movable for the same purpose, or the movable set may be the only set used.

From the foregoing it will be understood that the sets of rolls upon one side of the impression-cylinders ink one form only, the inner set of the two sets being raised to avoid inking the other form and returned again to its normal position to complete the inking of the first form, and that this operation occurs with both of the two sets of rolls employed in the machine. By this operation the resulting impression is more perfect, and it is practicable to use two kinds or qualities of ink, one kind or quality for each form, without danger of one being partially applied to the other form.

What is claimed is—

1. The combination, in a double-cylinder press, of a reciprocating bed carrying two forms, and two sets of ink-rolls for each form, one set fixed and the other set movable independently of the bed bodily out of inking contact with the other form, substantially as described.

2. The combination, with the frame of a fixed set of ink-rolls, of a second frame for a second set of ink-rolls, having an extending bar pivoted to the outer end of the other frame and steadied laterally thereby, a cam, and a bell-crank connected to the second frame for raising it, substantially as described.

3. The combination of the fixed set of ink-rolls and a second set of ink-rolls mounted in a frame movable with respect to the fixed set, the abutting end of their frames being inclined and the opposite end of the movable frame let into a guide, substantially as described.

4. The combination of the fixed set of ink-rolls, a second set of ink-rolls mounted in a frame movable with respect to the fixed set, the abutting ends of their frames being inclined, a bell-crank pivoted to the frame of the fixed set of rolls and connected to move the movable set of rolls, a spring, and pins for the same depending directly from the movable frame, substantially as described.

In witness whereof I have hereunto set my hand, this 23d day of September, A. D. 1890, in presence of two witnesses.

JOHN BROOKS.

Witnesses:

FRANK H. SMITH,

JOHN H. VAN WINKLE.