

H. J. SALMON & J. CAPPER.
 ROTARY PRINTING MACHINE.
 APPLICATION FILED DEC. 17, 1907.

919,471.

Patented Apr. 27, 1909.
 4 SHEETS—SHEET 1.

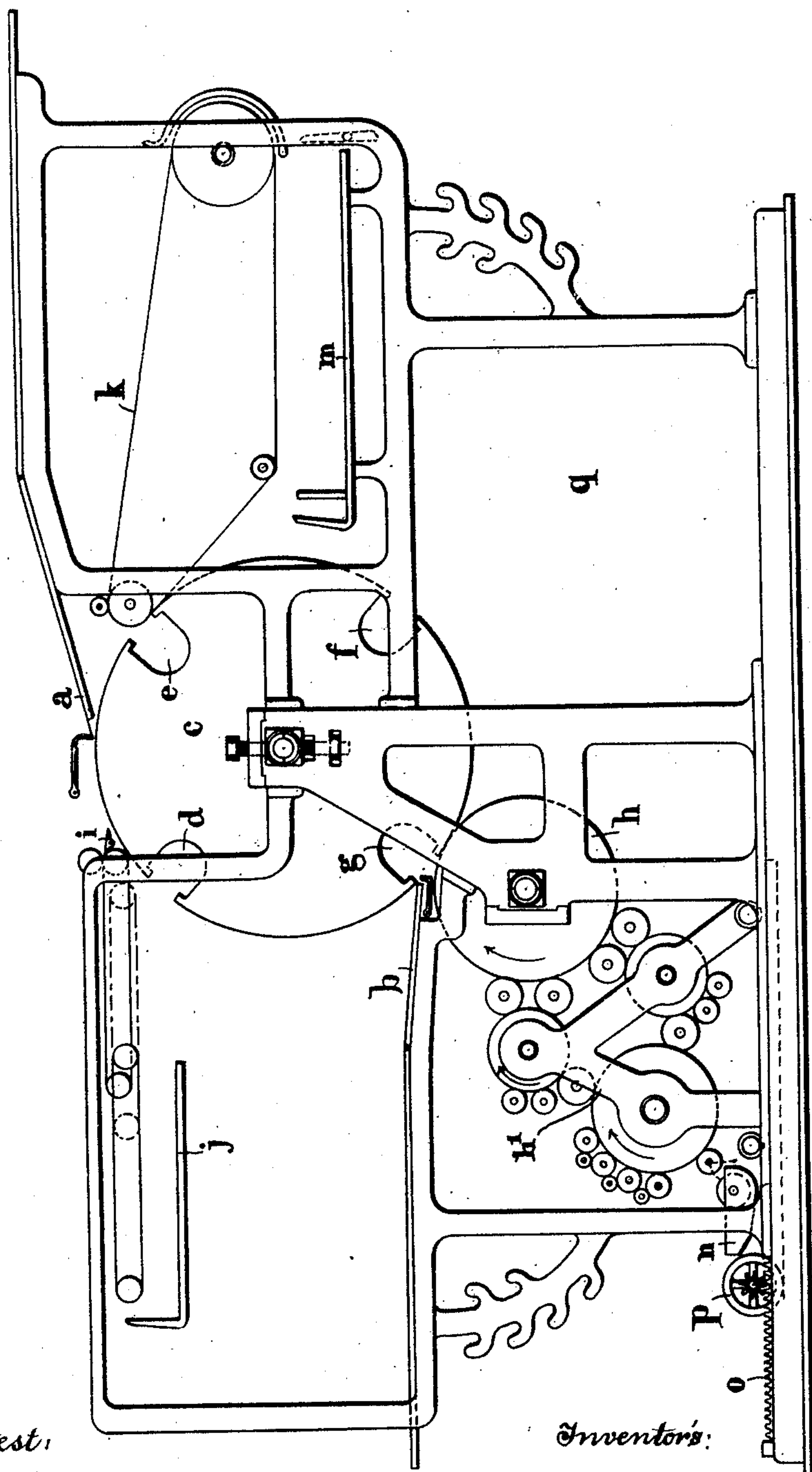


Fig. 1.

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Inventors:

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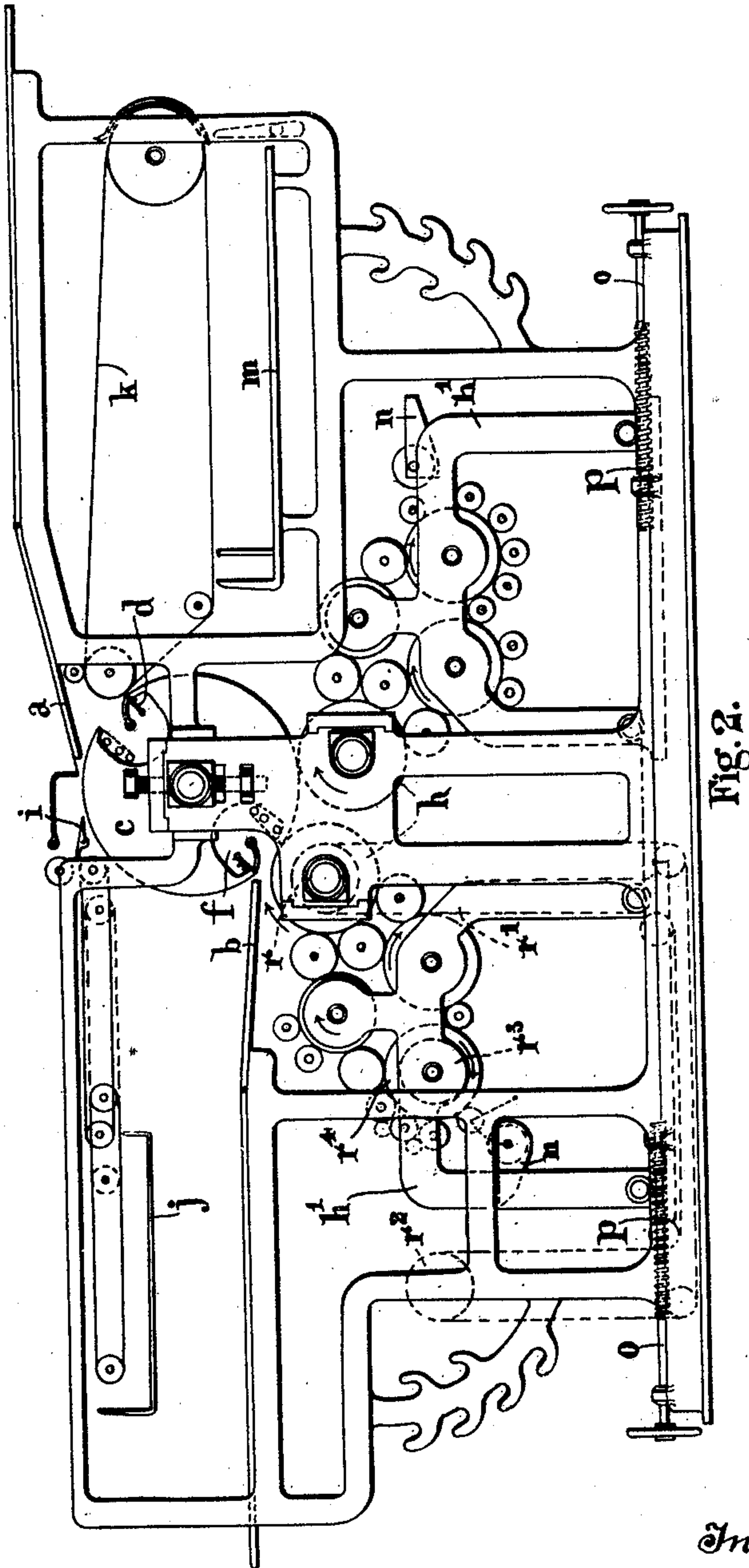


Fig. 2.

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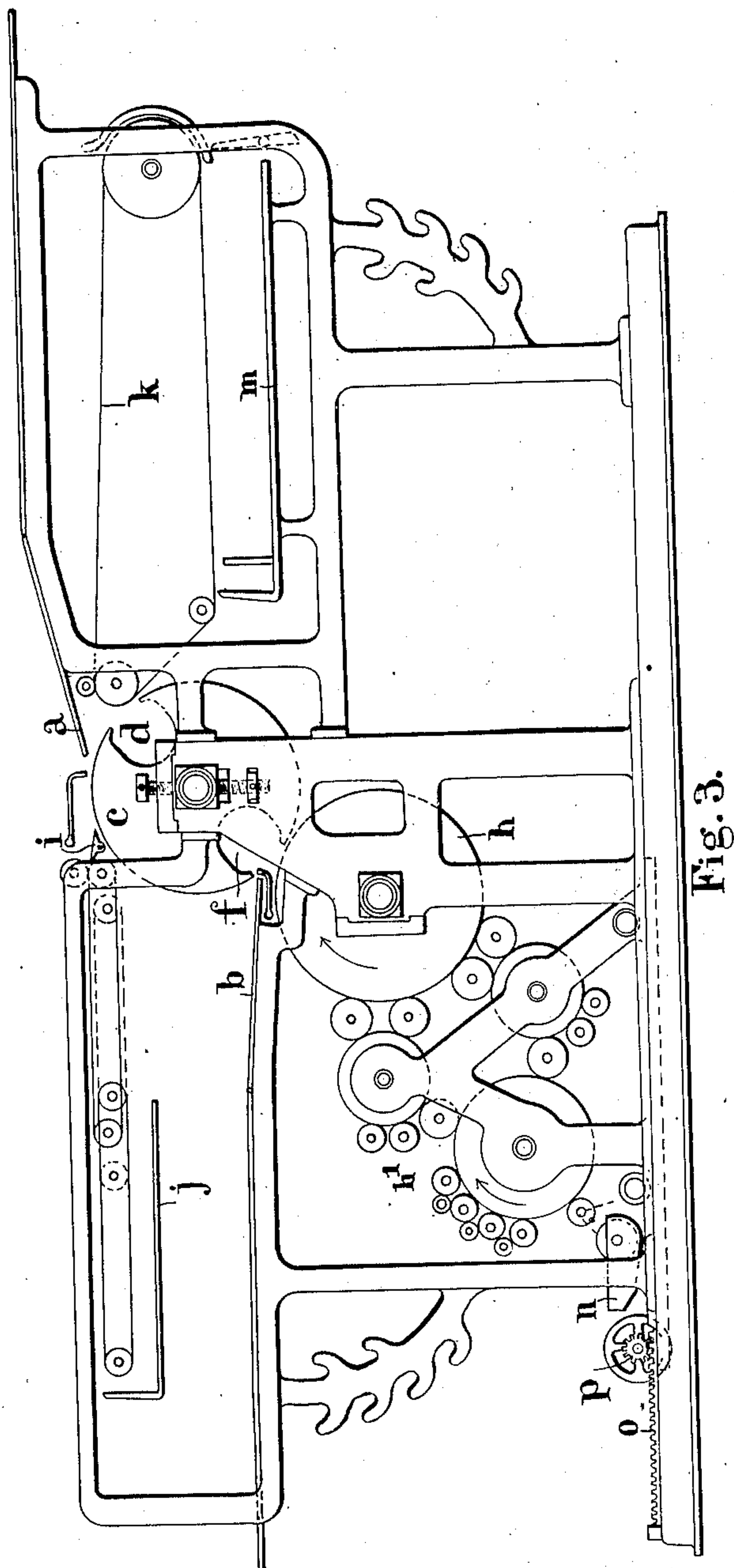


Fig. 3.

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4 SHEETS—SHEET 4.

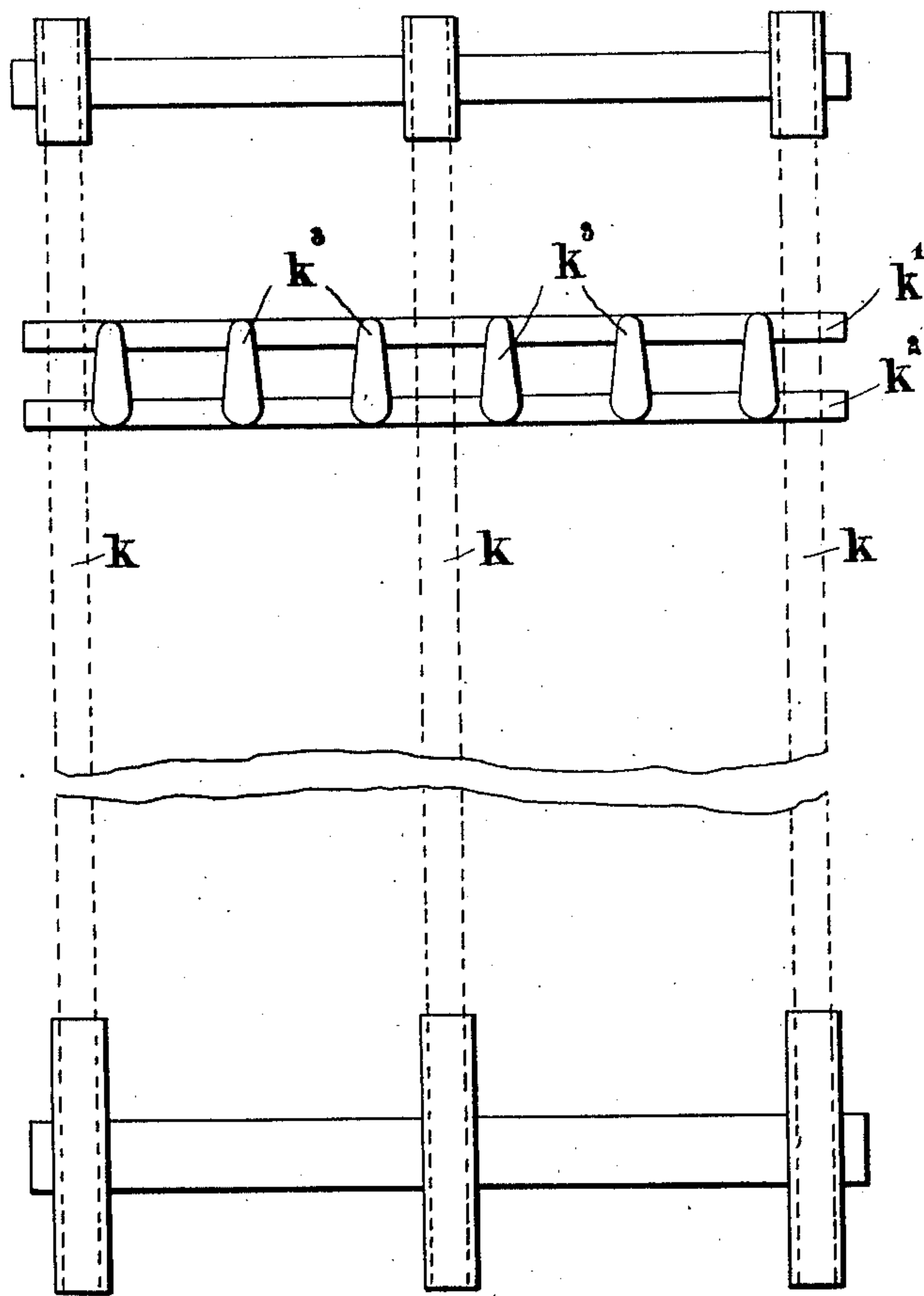


Fig. 4.

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UNITED STATES PATENT OFFICE.

HERBERT JAMES SALMON AND JOHN CAPPER, OF STOCKPORT, ENGLAND.

ROTARY PRINTING-MACHINE.

No. 919,471.

Specification of Letters Patent.

Patented April 27, 1909.

Application filed December 17, 1907. Serial No. 406,940.

To all whom it may concern:

Be it known that we, HERBERT JAMES SALMON and JOHN CAPPER, subjects of the King of Great Britain and Ireland, residing at 5 Woodley Iron Works, near Stockport, in the county of Chester, England, have invented certain new and useful Improvements in Rotary Printing-Machines, of which the following is a specification.

10 This invention relates to rotary machines for printing upon one side of sheets of paper or the like, and has for its object to produce such a machine capable of dealing with a larger quantity of work with but one impres- 15 sion cylinder than is at present possible with the usual flat type bed machine employed for this purpose. Heretofore it has been proposed, with this object in view, to feed simultaneously two or more sheets of paper to one 20 impression cylinder provided with two or more sets of grippers, and to employ plate cylinders of the same diameter as, or of less diameter than, the impression cylinder for printing one or more times for each revolu- 25 tion of the latter.

Our invention comprises the improved combinations and arrangements of parts hereinafter described and claimed.

Referring to the two accompanying sheets 30 of explanatory drawings;—Figure 1 is an elevation representing a printing machine having our invention applied thereto and capable of giving two impressions, which may be different in character, twice in each revolution 35 of the impression cylinder. Fig. 2 similarly represents the application of our invention to a printing machine for giving two similar impressions, in two colors, in each revolution of the impression cylinder. Fig. 3 illustrates a 40 further application of the invention, the printing machine in this case being capable of giving two impressions, which may be different in character, in each revolution of the impression cylinder. Fig. 4 is a detail view 45 to be hereinafter referred to.

The same reference letters in the different views indicate the same or similar parts.

50 In the arrangement shown at Fig. 1, we arrange feed boards *a*, *b* respectively at the upper and lower sides of the impression cylinder *c* and provide such cylinder with four sets of clips or grippers fitted at *d*, *e*, *f* and *g*, respectively, for taking hold of the sheets of paper delivered by such feed boards *a* and

b in the usual manner. The clips or grippers 55 are disposed at equal intervals around the circumference of the impression cylinder *c*, as shown, two of said grippers as at *d* and *f*, which are on opposite sides of the impression cylinder *c*, being arranged to take the sheets 60 from one feed board as *a*, and the other two as at *e* and *g* to take them from the other feed board *b*. The grippers are not shown in this figure but they are illustrated at *d* and *f* in Fig. 2. The type or plate cylinder *h* is of 65 half the diameter of the impression cylinder *c*, so that it will print twice for each revolution of the impression cylinder. The cylinder *h*, may carry stereo, electro-type or other printing plates, or may support turtles 70 carrying wood blocks, type or linotype slugs; or it may carry zinc or other suitable metal plates which will be used in combination with the damping and inking rollers usual for the class of work with which they 75 deal. In the example illustrated, the cylinder *h*, may have two different forms on its circumferential surface, and in this case the alternate sections of the impression cylinder *c* will receive their impressions from one form and 80 the other sections from the other form. The sheets fed to the impression cylinder *c*, from the feed board *b* are delivered from the former beyond the upper feed board *a* (measured in the direction of rotation of the im- 85 pression cylinder), the usual switches or like parts *i* being brought into contact with such cylinder for directing the sheets away therefrom and on to the tapes, sticks or other delivery devices from which they will 90 pass on to the board *j*. But the sheets fed to the impression cylinder from the feed board *a* will be caught by suitable clips or grippers on the endless band *k* and delivered on to the board *m*. Said bands *k* may comprise, as 95 shown in Fig. 4, a number of chains carrying bars as *k*¹, *k*², the latter carrying fingers or clips *k*³ adapted to press against the surface of *k*¹ and so hold the end of a sheet of paper between them. The bars *k*² will be rotated 100 by any ordinary mechanism as usually employed for this purpose. It will be seen that when the type or plate cylinder *h* is arranged to give two impressions of different character for each of its revolutions, all the sheets with 105 the same impression will be delivered to the same delivery board, for similar impressions, as before described, will be given on alter-

nate sections of the cylinder *c*, and only alternate sheets are delivered to the same delivery board. The cylinder *h* has the usual inking and distributing rollers receiving their ink from the duct *n* by the vibratory roller as shown. The inking rollers are preferably supported in a suitable carriage *h'* and arranged for movement relatively to the type or plate cylinder *h*, by means, for example, as the rack and pinion *o*, *p*.

In the machine as illustrated at Fig. 1, it will be seen that a large space is left at the part *q*, for enabling a person to readily obtain access to the impression and type or plate cylinders.

In the machine as illustrated at Fig. 2, the impression cylinder *c* is fitted with only two sets of grippers *d*, *f*, one as *d* receiving sheets from the feed board *a*, and the other *f*, receiving sheets from the feed board *b*. Two type or plate cylinders *h* are employed for printing in two colors in the well known manner, each cylinder receiving ink from a duct *n* through the usual vibratory, distributing and inking rollers, as shown. The cylinders *h* are of half the diameter of the impression cylinder and therefore give an impression twice in each revolution of the latter cylinder. The carriages carrying the inking rollers can be moved relatively to the cylinders *h* by means of the screw and nut device illustrated. We may if desired dispense with one of the cylinders *h* in this machine when printing in one color only.

The machine as illustrated in Fig. 3 has a type or plate cylinder *h* of the same diameter as the impression cylinder *c*. The cylinder *h* has two sets of type or plates which may be different in character and the cylinder *c* has two impression surfaces. The delivery arrangements are the same as shown in Figs. 1 and 2.

In the machines shown at Figs. 1 and 3, we may if desired employ two cylinders *h* with their inking rollers for printing in two colors.

The switches or like parts *i* in all the machines or arrangements illustrated are brought into contact with and removed from the surface of the impression cylinder *c* at the proper times by any usual and suitably arranged mechanism.

The sheets to be printed may be placed in the grippers on the impression cylinder *c* by hand or by automatic feeders of any usual and suitable construction. For example, we may employ a roll feed with cutting rollers for delivering sheets of a certain size at one feed board and an automatic sheet feeder at the other feed board. Or we may employ a roll feed and a hand feed, or an automatic sheet feed and a hand feed, or any other combinations of such feeding means.

If desired arrangements may be made for driving the inking apparatus when it is out

of gear with the cylinder *h*. For example as indicated in dotted lines in Fig. 2 wherein *r* is an intermediate spur wheel or pulley carried loosely on the shaft of the cylinder *h* but capable of being driven from such shaft by a clutch or like device when required. Said wheel or pulley *r* drives a band or chain *r'* which rotates a pulley or spur wheel *r''* capable of engaging the spur wheel *r''* on the roller *r'* when the carriage *h'* is moved away from the cylinder *h*. By this means the inking and distributing rollers and the printing cylinder *h* are driven in unison without making contact with one another and thus the ink is distributed on the rollers ready for engagement with the cylinder *h*.

By the use of our invention we can with one impression cylinder more effectively accomplish a greater amount of work in a given time than is at present possible with flat type bed machines which are usually employed for separate sheet printing.

Having now described our invention, what we claim as new and desire to secure by Letters Patent is;—

1. In rotary sheet printing machines, the combination consisting of a single impression cylinder, a plurality of grippers on said impression cylinder, means for feeding a plurality of sheets to said cylinder during each revolution from two points respectively above and below the cylinder axis, separate delivery means alternating and corresponding with said feeding means, a printing cylinder, and inking and distributing rollers for said printing cylinder, substantially as described.

2. In rotary sheet printing machines, the combination consisting of a single impression cylinder, a plurality of grippers on said impression cylinder, means for feeding a plurality of sheets to said cylinder during each revolution from two points respectively above and below the cylinder axis, separate delivery means alternating and corresponding with said feeding means, one of said delivery means turning the sheets while delivering same, a plurality of divisions on said printing cylinder corresponding with the divisions formed by the said grippers on said impression cylinder, substantially as described.

3. In rotary sheet printing machines, the combination consisting of a single impression cylinder, a plurality of grippers on said impression cylinder, means for feeding a plurality of sheets to said cylinder during each revolution from two points respectively above and below the cylinder axis, separate delivery means alternating and corresponding with said feeding means and each delivering the sheets with their printed side uppermost, a plurality of printing cylinders

for printing in more than one color, inking
and distributing rollers for said printing cyl-
inders, carriages for said rollers and means
for driving said inking and distributing
5 rollers when out of engagement with said
printing cylinders, substantially as de-
scribed.

In testimony whereof, we affix our signa-
tures in presence of two witnesses.

HERBERT JAMES SALMON.

JOHN CAPPER.

Witnesses:

VIVIAN ARTHUR HUGHES,
CHARLES CONRAD.