(No Model.) 2 Sheets—Sheet 1.

B. W. CHILD.

PAPER FEEDING MACHINE.

No. 567,261. Patented Sept. 8, 1896.

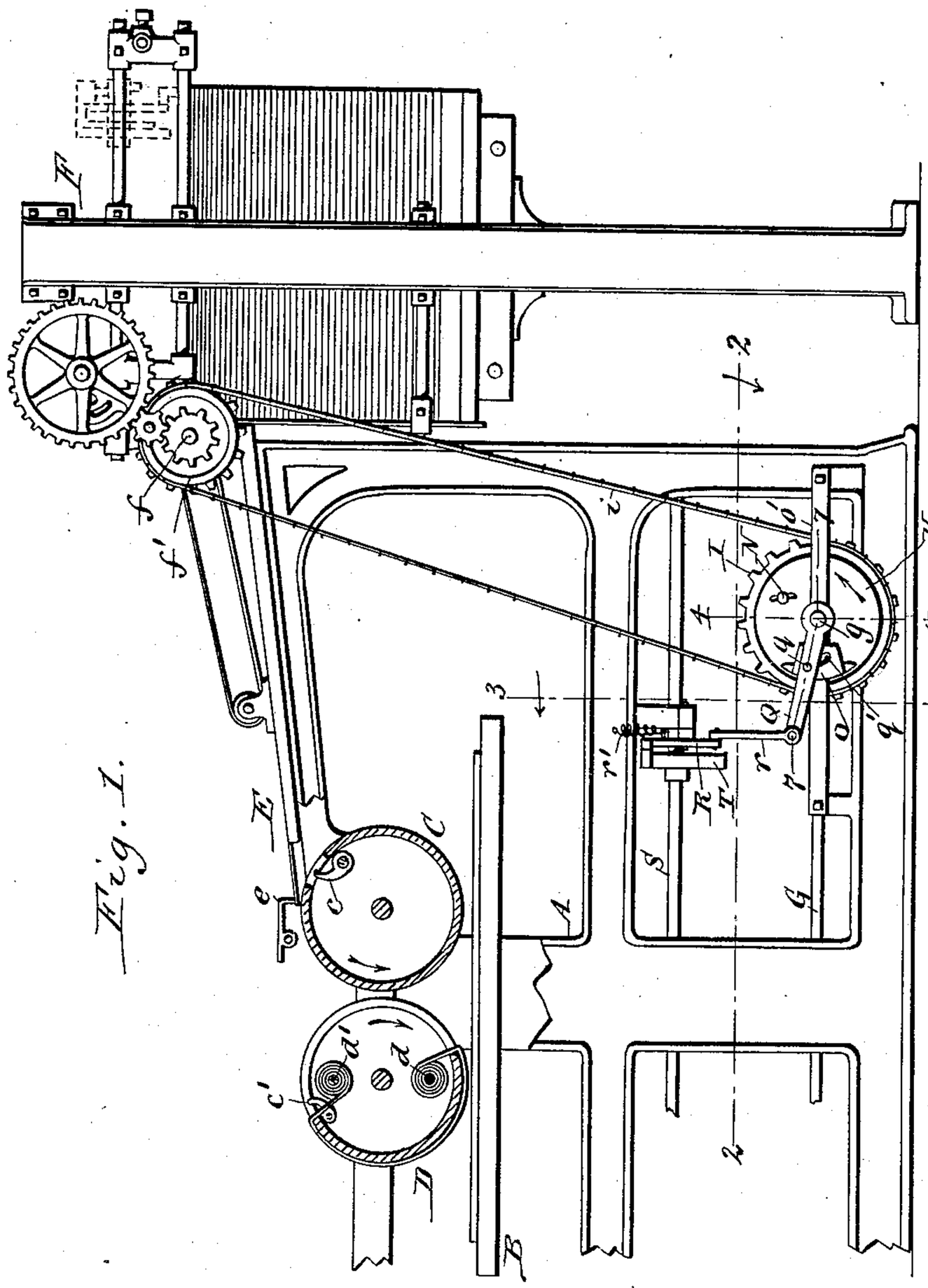

Fig. 1.

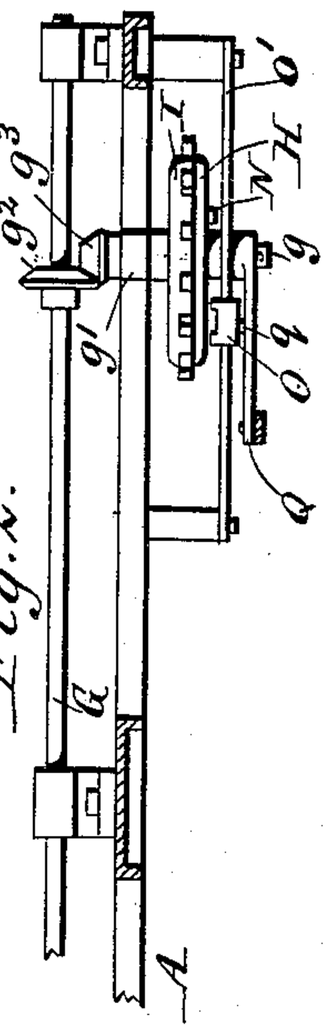

Fig. 2.

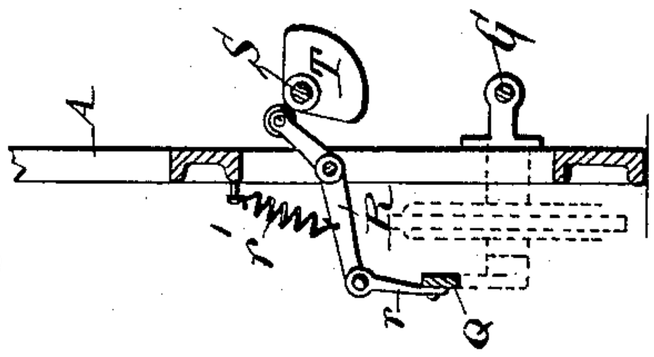

Fig. 3.

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(No Model.) 2 Sheets—Sheet 2.

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PAPER FEEDING MACHINE.

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Fig. 4.

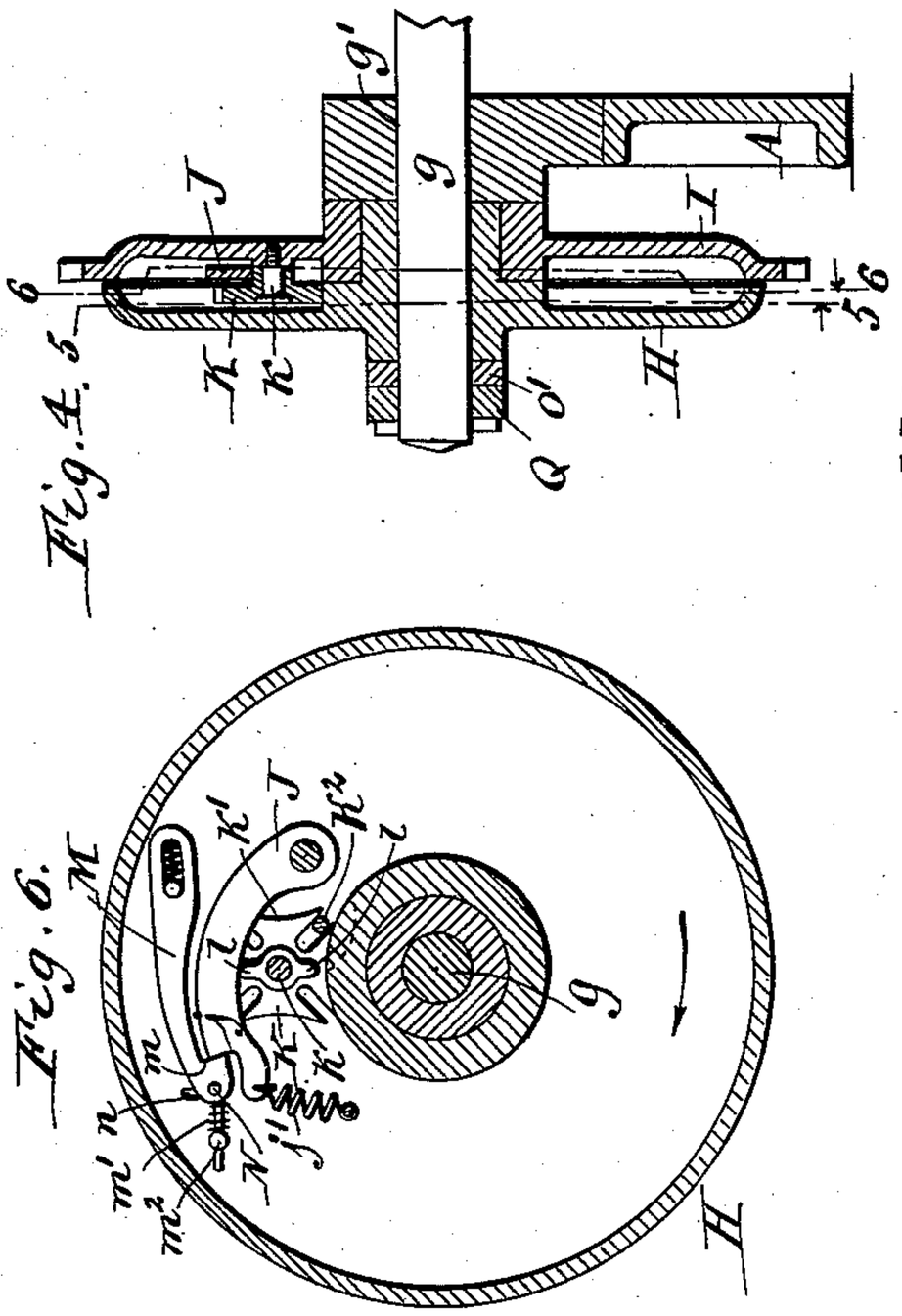

Fig. 6.

Fig. 5.

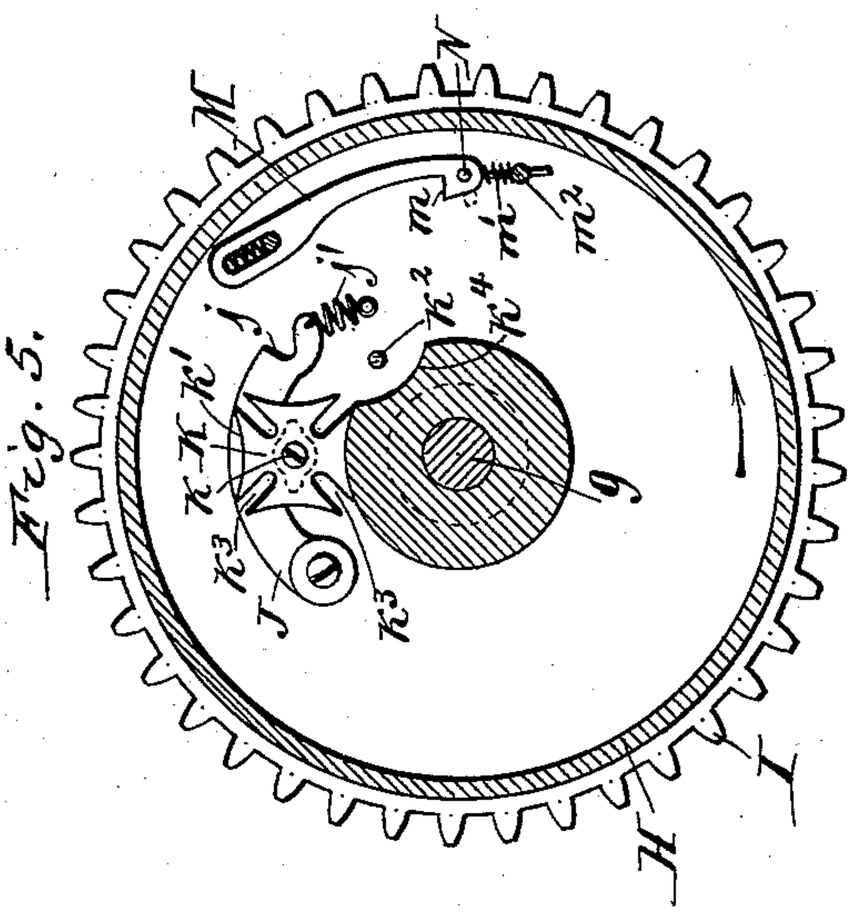

Fig. 8.

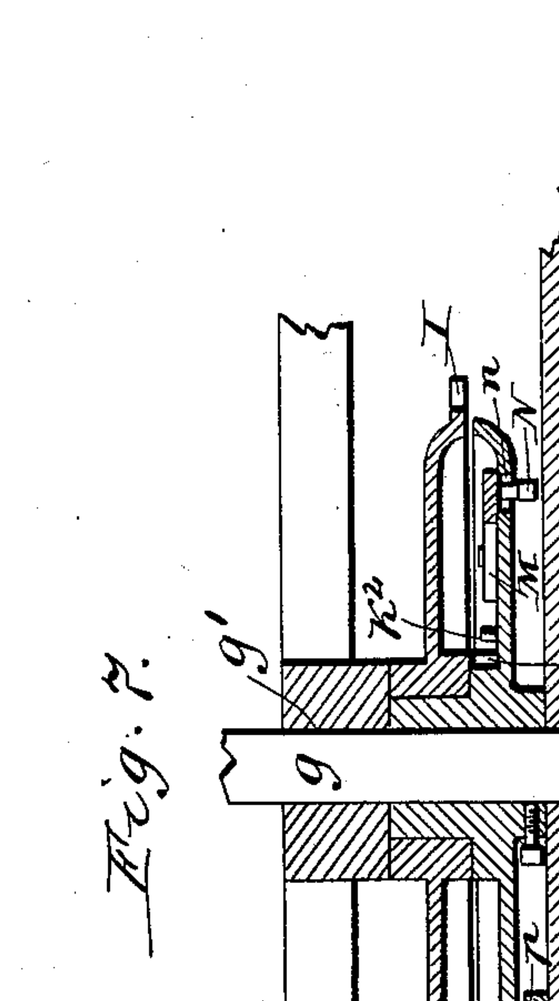

Fig. 9.

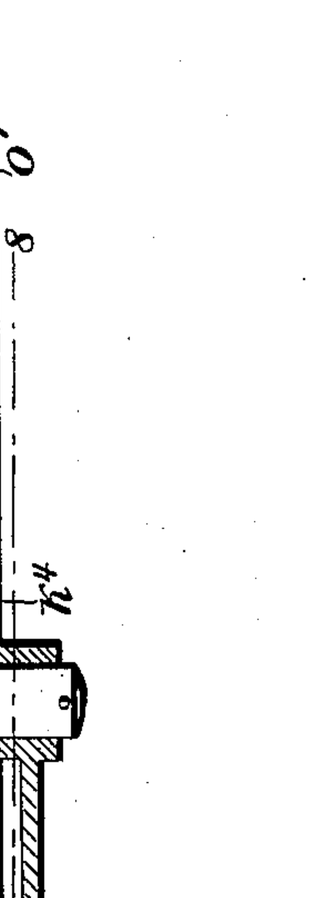

Fig. 7.

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UNITED STATES PATENT OFFICE.

BRAINERD W. CHILD, OF NEW YORK, N. Y., ASSIGNOR TO THE ECONOMIC MACHINE COMPANY, OF SAME PLACE.

PAPER-FEEDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 567,261, dated September 8, 1896.

Application filed September 13, 1895. Serial No. 562,363. (No model.)

To all whom it may concern:

Be it known that I, BRAINERD W. CHILD, a citizen of the United States, residing at New York, in the county and State of New York, have invented a new and useful Improvement in Paper-Feeding Machines, of which the following is a specification.

This invention relates to a clutch mechanism which is interposed between a printing-press provided with mechanism whereby the tympan-sheet is periodically shifted and a paper-feeding machine whereby sheets of paper are fed to the press, and which clutch mechanism is so constructed that the paper-feeder is automatically stopped while the tympan-sheet is being shifted and again started when the tympan-sheet has been shifted and the printing-press is in condition to resume printing. Such a clutch mechanism interposed between such a tympan-sheet-shifting mechanism and a paper-feeding machine is described and shown in Letters Patent No. 541,265, dated June 18, 1895, granted to E. H. Cottrell, to which reference is made for a full description of such tympan-sheet-shifting mechanism.

The object of my invention is to produce an efficient and reliable clutch mechanism for controlling the paper-feeder automatically from the shaft of the tympan-sheet-shifting mechanism.

In the accompanying drawings, consisting of two sheets, Figure 1 is a fragmentary side elevation of a perfecting printing-press and an automatic paper-feeder provided with my improvements. Fig. 2 is a horizontal section thereof in line 2 2, Fig. 1. Fig. 3 is a vertical section in line 3 3, Fig. 1. Fig. 4 is a vertical section, on an enlarged scale, in line 4 4, Fig. 1. Fig. 5 is a vertical section in line 5 5, Fig. 4, showing the pawls uncoupled. Fig. 6 is a similar section in line 6 6, Fig. 4, looking in the opposite direction and showing the pawls coupled. Fig. 7 is a horizontal section, on an enlarged scale, in line 7 7, Fig. 1. Fig. 8 is a fragmentary vertical section of the shifting block and adjacent parts, taken in line 8 8, Fig. 7. Fig. 9 is a fragmentary elevation of the shifting block and its supporting-bar, viewed from the inner side thereof.

Like letters of reference refer to like parts in the several figures.

A represents the main frame of a perfecting printing-press; B, the reciprocating type-supporting bed; C D, the first and second impression-cylinders, provided with grippers *c c'* and capable of moving alternately toward and from the type-bed; E, the feed-board, and *e* the front drop-guides.

D represents the tympan-sheet which covers the face of the second impression-cylinder and which is automatically unwound at intervals from a roller *d* and wound upon a roller *d'*, arranged within the cylinder. When the grippers of the first cylinder have grasped the sheet, this cylinder is lowered upon the type-bed, whereby the sheet is carried around this cylinder in contact with the forwardly-moving bed and the second cylinder is raised and makes an idle revolution. After the first cylinder has made one complete revolution it transfers the sheet to the second cylinder and the latter is lowered for pressing the sheet against the backwardly-moving bed and the first cylinder is raised and makes an idle revolution. When the shifting of the tympan-sheet takes place, both impression-cylinders are held in an elevated position out of engagement with the bed and the cylinders make two idle revolutions, during which time the front drop-guides are not raised and the grippers of the first cylinder are held open, so that no sheets are fed to this cylinder.

F represents an automatic paper-feeder of any suitable construction whereby the sheets of paper are successively fed from a pile to the front drop-guides. This feeder is provided with a driving-shaft *f*, having a sprocket-wheel *f'* at one end, which receives motion from the printing-press for driving the feeder. In order to arrest the operation of the paper-feeder, so that no sheets are fed to the press while the latter is not printing, and in order to start the feeder again in proper register with the press, a registering-clutch is interposed between the paper-feeder and the shaft of the press from which the feeder is driven. This clutch is constructed preferably as shown and described in Letters Pat-

ent of the United States No. 511,390, dated December 26, 1893, and is composed substantially of the following parts, which operate as hereinafter described:

G represents one of the continuously-rotating longitudinal shafts of the printing-press, and g a transverse shaft journaled in a bearing g' on the main frame and driven from the longitudinal shaft by gear-wheels g^2 g^3.

H is a carrying-disk which is secured to the outer end of the transverse shaft, and I is a sprocket-wheel mounted loosely upon the hub of the carrying-disk and connected with the sprocket-wheel of the feeder-shaft by a chain belt i.

J represents an inner clutch-pawl pivoted to the sprocket-wheel and provided with an external shoulder or hook j. The free end of this pawl is held yieldingly in its innermost position by a spring j', connecting the same with the sprocket-wheel.

K represents a star-wheel whereby this pawl is automatically moved outward, and which is mounted on an arbor k, secured to the sprocket-wheel. The star-wheel is provided in its periphery with four equidistant concave faces k', which are adapted to engage, one at a time, against the convex peripheral surface of the hub of the carrying-disk.

k^2 is a trip-pin arranged on the carrying-disk and adapted to engage with one of four radial notches k^3, formed in the star-wheel between its concave faces, whereby the star-wheel is turned, when the carrying-disk turns, independently of the press sprocket-wheel. The star-wheel is held against rotation on its arbor during an entire revolution of the carrying-disk by one of the concave faces of the star-wheel engaging with the convex surface of the hub of the carrying-disk. At the end of each revolution of the carrying-disk its trip-pin engages in one of the radial notches in the star-wheel and turns the same the distance of one face. The periphery of the carrying-disk hub is provided opposite the trip-pin with a recess k^4, which permits the star-wheel to turn when the trip-pin engages therewith. In its innermost position the inner pawl J rests against the hub of the star-wheel, whereby the inward movement of this pawl is limited.

l represents two trip-lugs formed radially on diametrically opposite sides of the star-wheel hub and adapted to engage against the inner pawl and move the same outwardly. In the position of the parts represented in Fig. 5 neither trip-lug is in engagement with the clutch-pawl and the latter is in its innermost position. Upon revolving the star-wheel one of its trip-lugs moves the pawl outwardly, as represented in Fig. 6.

M represents an outer clutch-pawl which is adapted to engage with the inner pawl J and couple the press sprocket-wheel to the carrying-disk and press-shaft. The outer clutch-pawl is provided with a shoulder or hook m, which is adapted to engage with the hook of the inner pawl and is pivoted on the carrying-disk. In the operative or innermost position of the outer pawl its hook is arranged in the path in which the hook of the inner pawl travels, when the latter is moved outwardly, which causes the outer pawl to engage with the inner pawl and so causes the carrying-disk to rotate the sprocket-wheel. The hook of the outer pawl is yieldingly held in or out of engagement with the hook of the inner pawl by a spring m', bearing with its ends against the pawl, and a post m^2.

N represents a shifting-pin which is secured to the outer pawl and which passes outwardly through a slot n in the carrying-disk. When the outer pawl is withdrawn, as shown in Fig. 5, the press sprocket-wheel is uncoupled from the carrying-disk and the press can be operated without operating the paper-feeder. When the press-shaft is rotated under these conditions, the trip-pin turns the star-wheel and the latter moves the inner pawl outward into its operative position during each alternate revolution of the press-shaft. The outward movement of the inner pawl is so timed that this movement takes places only when the mechanism of the press and feeder are in register. When it is desired to connect the paper-feeder with the printing-press, the outer pawl is released and moved inwardly. If the outer driving-pawl is moved inwardly while the inner driven pawl is retracted, the outer pawl will make one idle revolution, but during the next revolution the inner pawl will be moved outwardly into the path of the revolving outer pawl and engage with the same, thereby causing the printing-press and paper-feeder to work in unison and in proper register with each other. The outer actuating-pawl of this registering-clutch is automatically moved into and out of engagement with the inner pawl by mechanism which is connected with the tympan-shifting mechanism and which is constructed as follows:

O represents a shifting block whereby the outer clutch-pawl is moved into or out of engagement with the inner pawl. This block is arranged adjacent to the outer side of the carrying-disk and slides radially with reference to the carrying-disk on a guide-bar o', which is connected with the main frame. The inner side of the sliding block is provided with an inner cam p and an outer cam p', which face each other and which are adapted to engage alternately with the shifting-pin of the outer pawl. Upon shifting the sliding block outwardly, so that the inner cam stands in the path of the shifting-pin, the latter, while rotating with the carrying-disk, is moved outwardly and disengages the outer pawl from the inner pawl, thereby uncoupling the press and feeder. The carrying-disk continues to rotate idly with the outer pawl until the sliding block is shifted inwardly and its outer cam is brought into the path of the shifting-pin, which causes the

latter to engage with the outer cam and shifts the outer pawl inwardly into engagement with the inner pawl, thereby coupling the press and feeder.

Q is a rock-arm whereby the shifting block is actuated, and which is pivoted on the outer end of the transverse shaft *g*. This arm is provided with a pin *q* on one side, which engages in an oblique slot *q'* in the outer side of the shifting block, so that upon rocking said arm the shifting block will be moved toward or from the axis of the carrying-disk.

R is a rock-lever pivoted on the main frame and connected by a link *r* with the cam-arm. The rock-arm is turned for coupling the press and feeder by a spring *r'*, secured with its ends to the main frame and the outer arm of the rock-lever.

S represents an intermittently-rotating trip-shaft which is arranged horizontally in the main frame of the press, and which is connected with the tympan-sheet-shifting mechanism in such manner that the rotation of this trip-shaft causes the tympan-sheet-shifting mechanism to be actuated, while the tympan-sheet-shifting mechanism is at rest when the trip-shaft is at rest. This trip-shaft is part of the usual and well-known mechanism by which the tympan-sheet-shifting mechanism is actuated and connected with the front guides and other parts of the press, and is made use of here as a convenient part which moves intermittently in unison with the tympan-sheet-shifting mechanism. The mechanism by which this trip-shaft is connected with the tympan-sheet-shifting mechanism may be of any well-known and suitable construction, for instance as shown and described in said Letters Patent No. 541,265.

T represents a cam secured to this trip-shaft and engaging with the inner arm of the rock-lever for controlling the registering-clutch. The trip-shaft makes a complete revolution during the shifting operation of the tympan-sheet and then remains at rest until the tympan-sheet is again shifted. When the shaft is at rest, the retreating portion of the cam is in contact with the rock-lever (shown in Fig. 3) and the clutch is coupled and the feeder is running in register with the press. When the trip-shaft is rotated during the shifting operation of the tympan-sheet, the salient portion of the cam is brought into engagement with the rock-lever whereby the clutch-pawls are uncoupled and the paper-feeder is stopped. The parts remain in this position while the rock-lever rides over the salient face of the cam and until the receding face of the cam again reaches the rock-lever, when the resulting movement of the rock-lever again throws the pawls into engagement and permits the paper-feeder to be set in operation by the clutch at the proper time.

I claim as my invention—

1. The combination with a printing-press provided with a trip-shaft which controls the tympan-sheet-shifting mechanism, and a paper-feeder, of a clutch arranged in the driving mechanism of the feeder and provided with a shifting-pin for coupling or uncoupling said clutch, a shifting block provided with cams whereby the shifting-pin is operated, and a trip mechanism connecting said trip-shaft with the shifting block, substantially as set forth.

2. The combination with a printing-press provided with a trip-shaft which controls the tympan-sheet-shifting mechanism, and a paper-feeder, of a clutch arranged in the driving mechanism of the feeder and provided with a shifting-pin for coupling or uncoupling said clutch, a shifting block provided with cams whereby the shifting-pin is operated and with an oblique slot, a rock-arm provided with a pin engaging with said slot, and a trip mechanism connecting said trip-shaft with the rock-arm, substantially as set forth.

3. The combination with a printing-press provided with a trip-shaft which controls the tympan-sheet-shifting mechanism, and a paper-feeder, of a clutch arranged in the driving mechanism of the feeder and provided with a shifting-pin for coupling or uncoupling said clutch, a shifting block provided with cams whereby the shifting-pin is operated and with an oblique slot, a rock-arm provided with a pin engaging with said slot, a rock-lever having one of its arms connected with the rock-arm, and a cam operated from said trip-shaft and engaging with the other arm of the rock-lever, substantially as set forth.

Witness my hand this 30th day of August, 1895.

BRAINERD W. CHILD.

Witnesses:

THEO. L. POPP,

E. C. FULLER.