

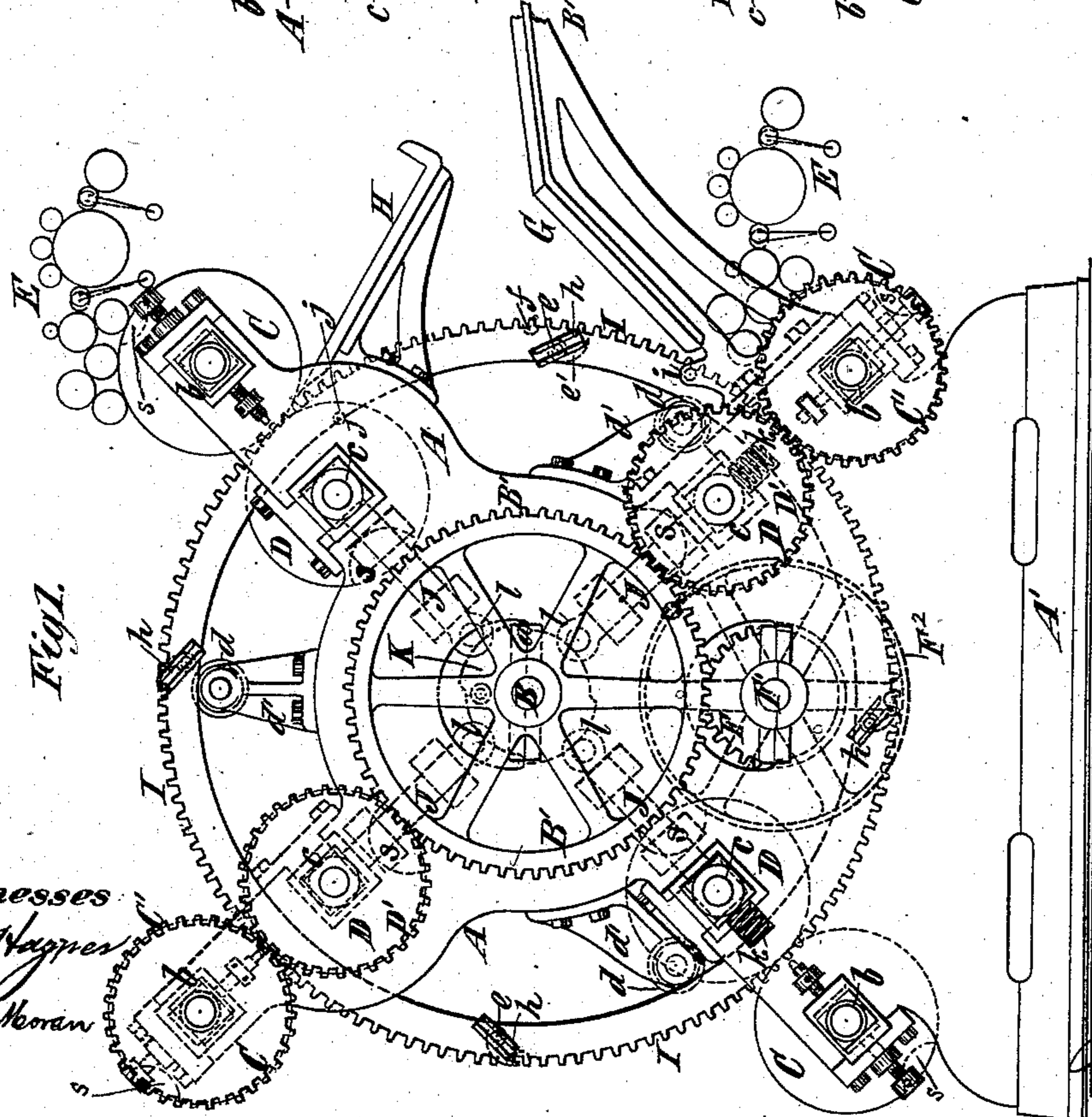
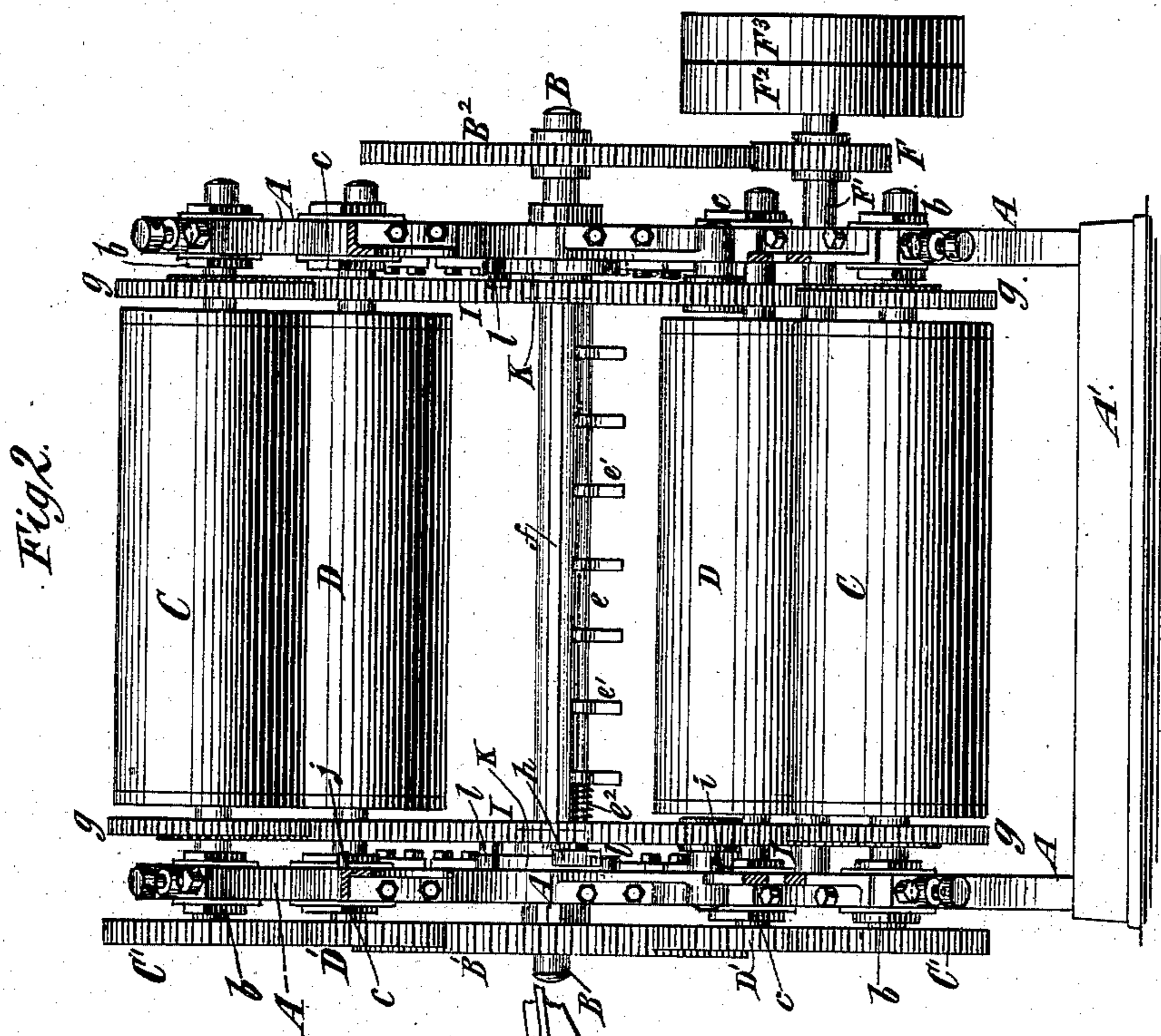
(No Model.)

2 Sheets—Sheet 1.

C. B. COTTRELL.  
PRINTING PRESS.

No. 293,313.

Patented Feb. 12, 1884.



Witnesses  
*Paul Wagner*  
*Ed L. Moran*

*Inventor*  
*C. B. Blewett*  
*by his Attorney*  
*Frank Brown*

(No Model.)

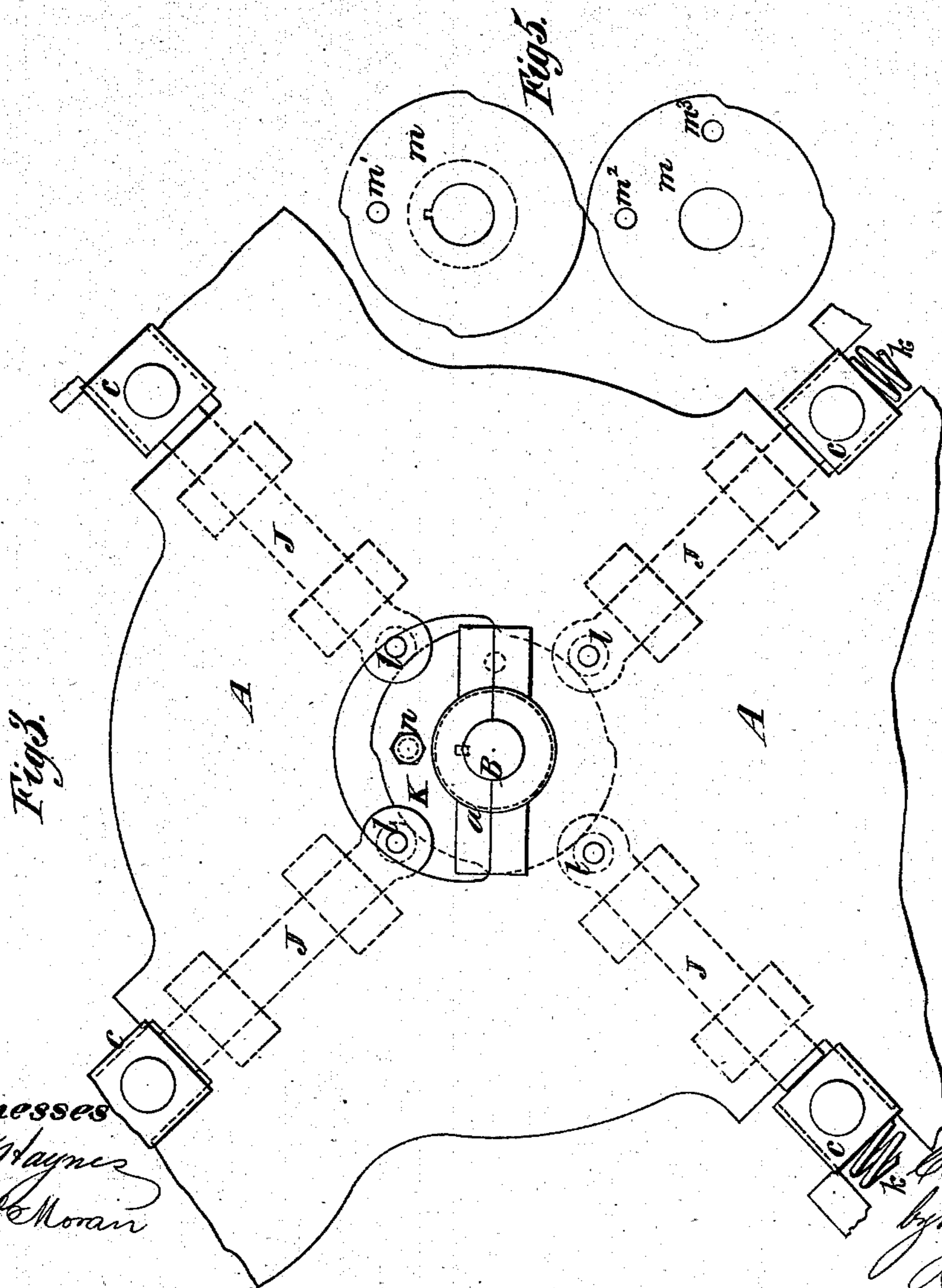
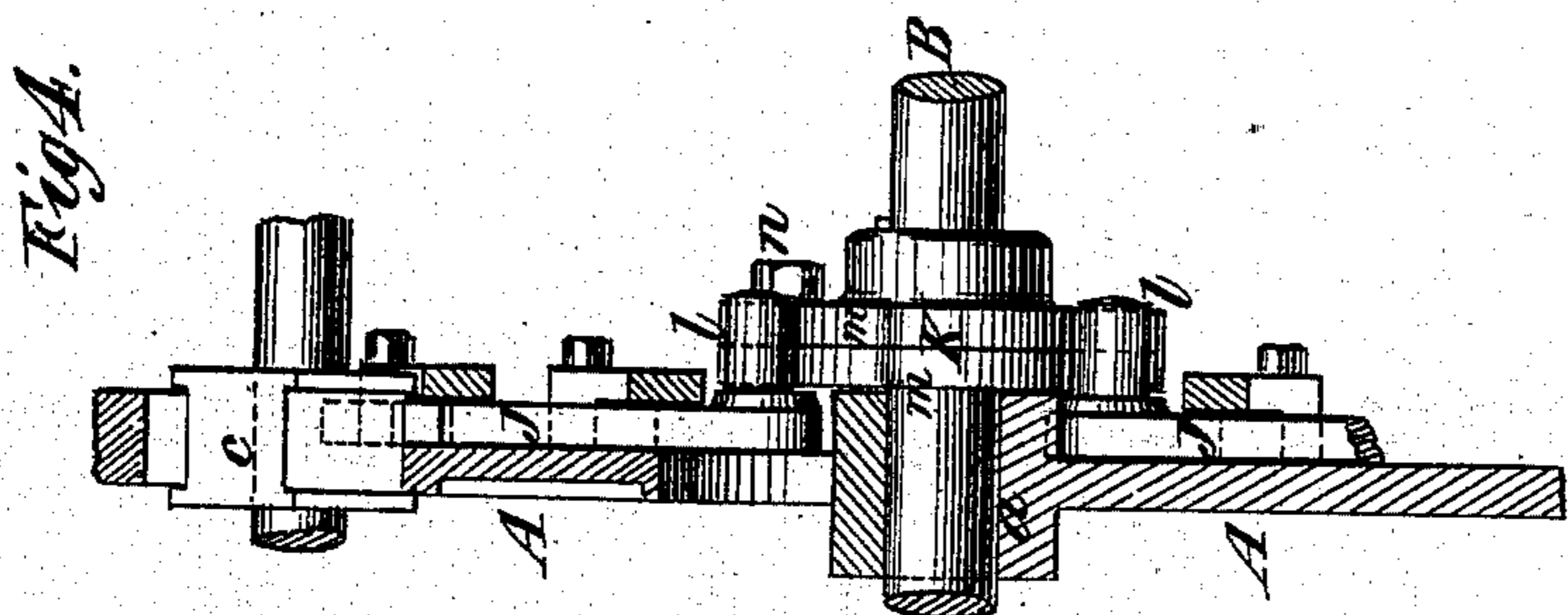
2 Sheets—Sheet 2.

C. B. COTTRELL.

PRINTING PRESS.

No. 293,313.

Patented Feb. 12, 1884.



Witnesses  
*Wm. H. Hayes*  
*Ed. L. Moran*

Inventor  
*C. B. Cottrell*  
by his Attorney  
*Robert Brown*

# UNITED STATES PATENT OFFICE.

CALVERT B. COTTRELL, OF WESTERLY, RHODE ISLAND.

## PRINTING-PRESS.

SPECIFICATION forming part of Letters Patent No. 293,313, dated February 12, 1884.

Application filed May 4, 1883. (No model.)

*To all whom it may concern:*

Be it known that I, CALVERT B. COTTRELL, a citizen of the United States, and a resident of Stonington, in the county of New London and State of Connecticut, have invented a new and useful Improvement in Printing-Presses, of which the following is a specification.

My invention is applicable more particularly to presses for color-printing, and relates to presses which make two or more impressions upon each sheet before it is delivered.

The object of the invention is to secure a very perfect register of the several impressions, and to provide a press which is very compact and occupies but little space, and one which is comparatively simple in construction.

The invention consists in the combination, with a number of separate pairs of form and impression cylinders arranged in a circular series, of a rotary series of grippers for presenting the sheets successively to the several pairs of cylinders in the series.

The invention also consists in the combination, with two or more pairs of form and impression cylinders arranged in a circular series, of a rotary annular gripper-carriage and attached grippers, for presenting sheets successively to the pairs of cylinders.

The invention also consists in certain novel details of construction in the rotary gripper-carriage, and in novel combinations of parts in the mechanism employed to operate the several pairs of cylinders and the gripper-carriage, which features are hereinafter described and referred to in the claims hereof.

The invention also consists in a novel combination whereby the impression-cylinders may be held against their form-cylinders continuously, so that the sheets will receive an impression from each form-cylinder when it is desired to operate the press with single rolling or inking of the form-cylinder, and whereby, when desired, the impression-cylinders may be moved away from their form-cylinders during their alternate revolutions, so that impressions will be given only during alternate revolutions of the cylinder, and the press will operate with double rolling or inking of the form-cylinders.

In the accompanying drawings, Figure 1 is

a side elevation of a press embodying my invention. Fig. 2 is an end elevation thereof. Fig. 3 is a side view of certain parts upon a larger scale. Fig. 4 is a detail sectional view upon the same scale as Fig. 3; and Fig. 5 is a detail view of two cams which are employed to hold the impression-cylinders against their form-cylinders, as hereinafter described.

Similar letters of reference designate corresponding parts in all the figures.

A designates the side frames of the press, and A' the bed-plate, whereon the side frames are secured.

B designates the center shaft of the press, which is supported in bearings *a* in the side frames, A. The shaft B forms the center, about which are arranged the several pairs of form and impression cylinders.

In this example of my invention four pairs of form and impression cylinders, CD, are represented. Each form-cylinder C and its impression-cylinder D form a pair separate from and independent of the others, and each form-cylinder has a separate inking apparatus, E, which may be of any well-known or suitable character. The inking apparatus for all the form-cylinders will be exactly alike, and I have therefore thought it sufficient to represent in outline the apparatus for two cylinders only. The several pairs of form and impression cylinders are arranged in a circular series about the shaft B. The several form-cylinders C are mounted in bearings or boxes *b*, and the several impression-cylinders D are mounted in bearings C, all of which are secured in the side frames A. The cylinders of each pair will be rotated in the same way, and I have, therefore, in Fig. 1, shown the gearing for operating the lower right-hand and upper left-hand pairs of cylinders only. The cylinders of each pair are geared together by spur-wheels C' D', and the wheels D' of the several pairs all gear into a large spur-wheel, B', on the center shaft, B. Obviously, the cylinders might be operated by other arrangements of gearing. Upon the end of the shaft B, opposite the wheel B', is a spur-wheel, B<sup>2</sup>, with which engages a pinion, F, on a counter or driving shaft, F', which is provided with fast and loose pulleys F<sup>2</sup> F<sup>3</sup>, for the reception of a driving-belt.

G designates the feed-board, from which the

sheets are fed; and H designates the delivery-board, here shown as arranged above the feed-board.

In connection with the pairs of form and impression cylinders arranged in a circular series, I may employ a rotary, circular, or annular gripper-carriage, or circular series of grippers. I have here shown a rotary gripper-carriage of simple and desirable construction. It consists of two large rings, I, arranged concentrically with the center shaft, B, and mounted on friction-rollers *d*, journaled in brackets *d'*, projecting from the side frames, A, as best shown in Fig. 1. When so mounted the rings are free to rotate with but little resistance from friction. The two rings I are connected by gripper rods or shafts *e*, each carrying gripper-fingers *e'*, and by bars or rods *f*, on which the said gripper-fingers close and hold the sheets. The two bars *e f* are best shown in Fig. 2, and extend from one ring to the other. Provision for the passage of the bars *e f* between the cylinders of each pair is afforded by cavities *s* in the peripheries of the cylinders C and D, as shown by dotted lines in Fig. 1. As the bars *e f* are brought between the cylinders of a pair, they are received in the cavity *s*, in which they are passed between the cylinders. The rings are arranged just outside of the ends of the cylinders C D and inside the side frames, A. Each of them has a toothed periphery, and upon both ends of each form-cylinder C are pinions or wheels *g*, which engage with said rings, and so rotate the gripper-carriage. Instead of providing each form-cylinder with driving-wheels for engaging with the rings, I may provide such wheels on one cylinder only. The gripper-carriage might be rotated by other mechanism than that here shown, if desired.

As here represented there are four gripper-rods, *e*, corresponding to the four pairs of form and impression cylinders; but, if desired, more than four pairs of cylinders and sets of grippers might be employed; or three pairs of cylinders might suffice for many purposes. Indeed, in cases where but two impressions are required I may employ two pairs of cylinders in connection with a rotary gripper-carriage. Upon the end of each gripper-rod *e* is a tumbler or arm, *h*, and upon the adjacent side frame, A, are projections *i j*, forming stationary cams, which act on these tumblers to turn the rods *e*, and so open and close the gripper-fingers *e'*. Each rod *e* may be acted upon by the usual spring, *e<sup>2</sup>*, (shown in Fig. 2,) to hold the gripper-fingers closed. When the gripper-rods approach the feed-board G, as shown in Fig. 1, the grippers are open; but as the sheet is fed to them the tumbler *h* strikes the projection *i*, and so turns the rods to close the gripper-fingers on the sheet. The sheet is then carried forward and presented successively to the cylinders of the several pairs, and as it approaches the delivery-board H the tumbler *h* strikes the projection *j*, and is moved so as to turn the gripper-rod *e* and

open the gripper-fingers to release the sheet, which is delivered onto the board H, the gripper-fingers remaining open to take the next sheet fed to them.

So far as described, the press might be used for printing where an impression from each form-cylinder is required; but I will now describe how the press may be adapted for taking impressions at each revolution of the cylinders, or from alternate revolutions only, thus adapting the press for single or double rolling or inking.

The bearings *c* of each impression-cylinder are movable slightly toward and from the center shaft, B, and when not pressed outward move automatically inward. The impression-cylinders of the two upper pairs will move inward by gravity, but those of the two lower pairs are moved inward by springs *k*, acting on their bearings *c*, as shown in Figs. 1 and 3. The bearings *c* of each impression-cylinder D are acted upon by plungers or push-rods J, arranged on the inner sides of the frames A, as best shown in Figs. 3 and 4, and the inner ends of these plungers or push-rods are provided with anti-friction rollers *l*, which bear upon cams K, secured to the center shaft, B, adjacent to each side frame, A. Each cam K is composed of two plates, *m m'*, of the form shown in Fig. 5. One plate is provided with a single bolt-hole, *m'*, and the other with two holes, *m<sup>2</sup> m<sup>3</sup>*. One plate may be turned or adjusted circumferentially relatively to the other, and they are then connected by a bolt, *n*. When this bolt *n* is inserted through the holes *m' m<sup>2</sup>*, the projections of the two plates will coincide, as shown in Fig. 3, and they will then constitute a cam having two projections, and the press will be adapted for double rolling or inking, and for taking impressions at alternate revolutions of the cylinders only. When thus operated, the sheets in feeding will be presented to alternate grippers only. When the bolt *n* is inserted through the holes *m' m<sup>3</sup>*, the projections of one plate *m* will cover the gaps in the other, and the two plates will then form a continuous cam, holding the impression-cylinders outward continuously. The press will then be adapted for single rolling or inking, and the sheets in feeding are presented to all the grippers, as they severally pass the feed-board.

It will be seen that this press is very compact, occupying but little room, and that it is comparatively simple in construction. I secure perfect register of the several impressions, and can readily adapt it for either single or double rolling or inking. It is also capable of doing very rapid work.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination, with a number of separate pairs of form and impression cylinders arranged in a circular series, of a rotary series of grippers for presenting the sheets successively to the several pairs of cylinders in the series, substantially as described.

2. The combination, with two or more pairs of form and impression cylinders arranged in a circular series, of a rotary annular gripper-carriage and attached grippers, for presenting sheets successively to the pairs of cylinders, substantially as described.

3. The combination, with two or more pairs of form and impression cylinders, of a center shaft, a gear-wheel thereon, gear-wheels on the several cylinders, engaging with the wheel on said center shaft, and a rotary gripper-carriage and attached grippers, for presenting sheets successively to the pairs of cylinders, substantially as described.

4. The combination, with two or more pairs of form and impression cylinders, of a rotary gripper-carriage for presenting sheets successively to the pairs of cylinders, toothed rings comprised in said carriage, and gear-wheels upon the shafts of the cylinders engaging with said rings and operating the gripper-carriage, substantially as described.

5. The combination of the pairs of form and impression cylinders C D, arranged in a circular series, the center shaft, B, and its gear-wheel B', the wheels C' D', gearing the cylinders of each pair together, and with the wheel B', the toothed rings I, comprised in the gripper-carriage, and the wheels g on the shafts of the form-cylinders, engaging with and driving said rings, substantially as described.

6. The combination, with pairs of form and

impression cylinders arranged in a circular series, of a rotary gripper-carriage for presenting sheets successively to the pairs of cylinders, and devices, substantially such as described, for relieving the impression-cylinders, to provide for double rolling or inking, substantially as set forth.

7. The combination, with pairs of form and impression cylinders arranged in a circular series, and a rotary gripper-carriage for presenting sheets successively to the pairs of cylinders, of a center shaft from which the cylinders derive motion, plungers or rods acting on the bearings of the impression-cylinders, and cams on said center shaft for controlling said plungers or rods to relieve the impression-cylinders for double rolling or inking, substantially as described.

8. The combination, with the center shaft, B, pairs of form and impression cylinders deriving motion therefrom, and a rotary gripper-carriage for presenting sheets successively to the pairs of cylinders, of the plungers J acting on the bearings of the impression-cylinders, and the cam K on said shaft B, composed of the plates or sections m m, one of which is circumferentially adjustable relatively to the other, substantially as described.

CALVERT B. COTTRELL.

Witnesses:

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ED. L. MORAN.