

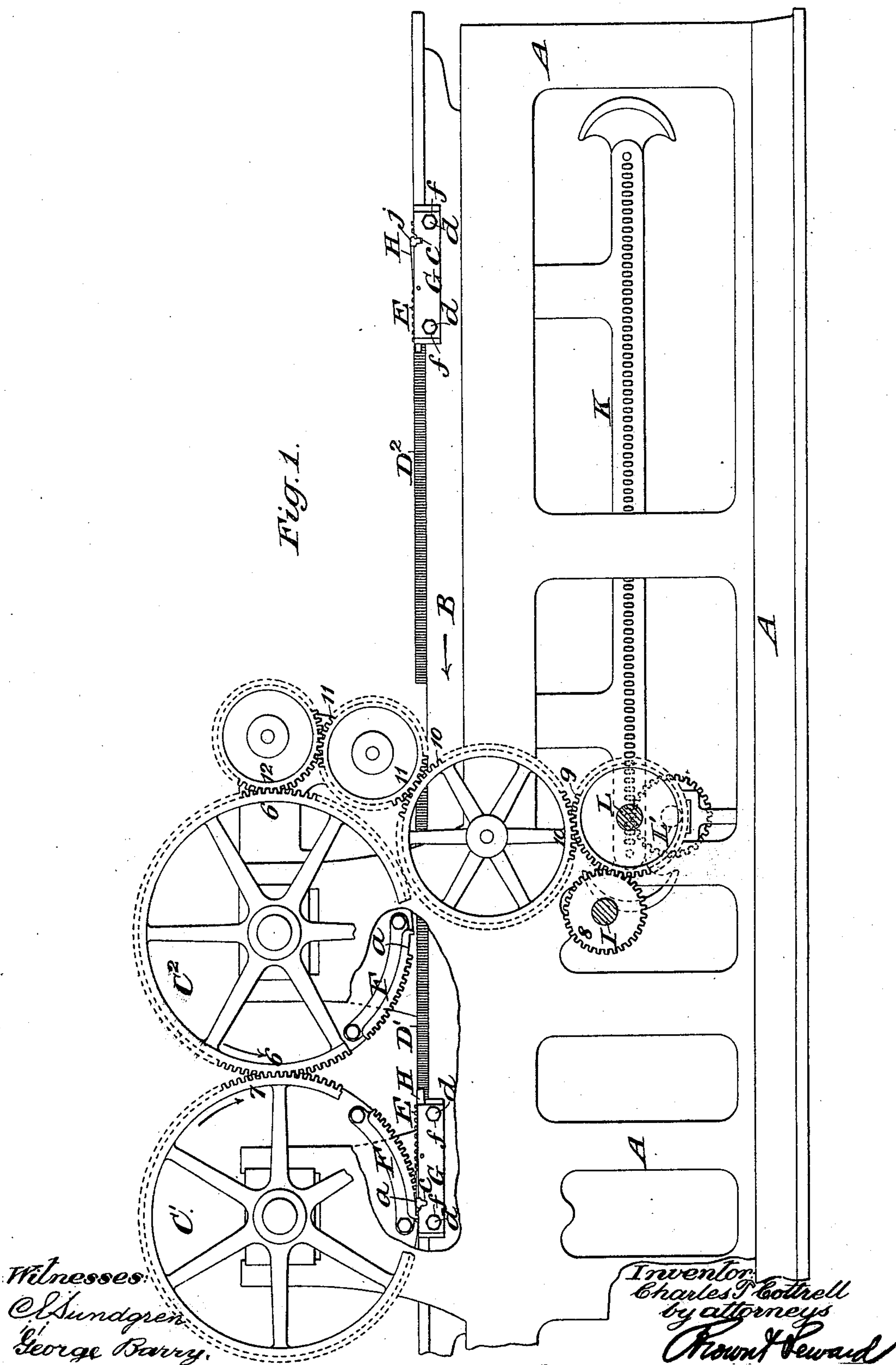
(No Model.)

2 Sheets—Sheet 1.

C. P. COTTRELL.  
PRINTING MACHINE.

No. 517,973.

Patented Apr. 10, 1894.



(No Model.)

2 Sheets—Sheet 2.

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Fig. 3.

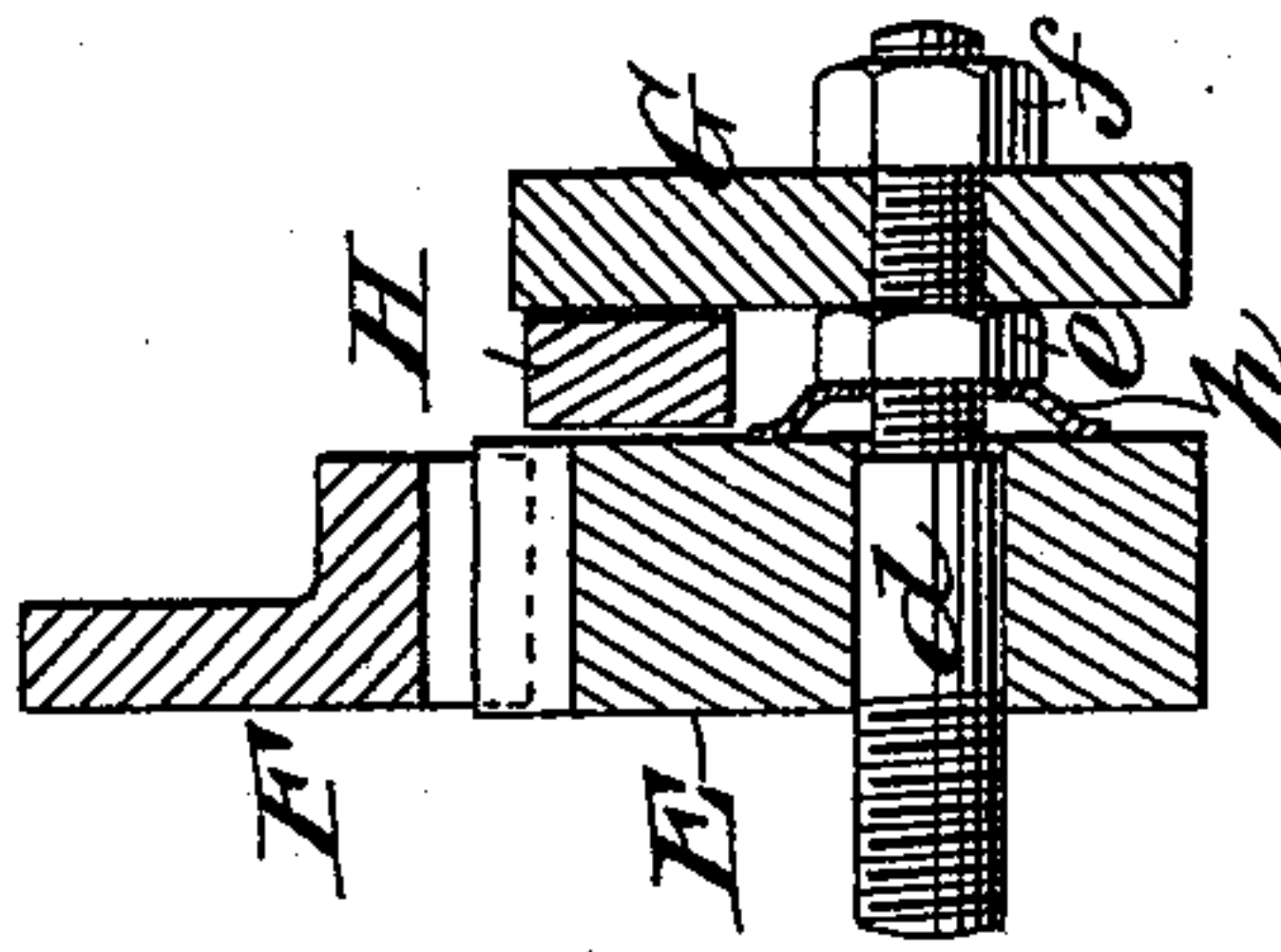


Fig. 2.

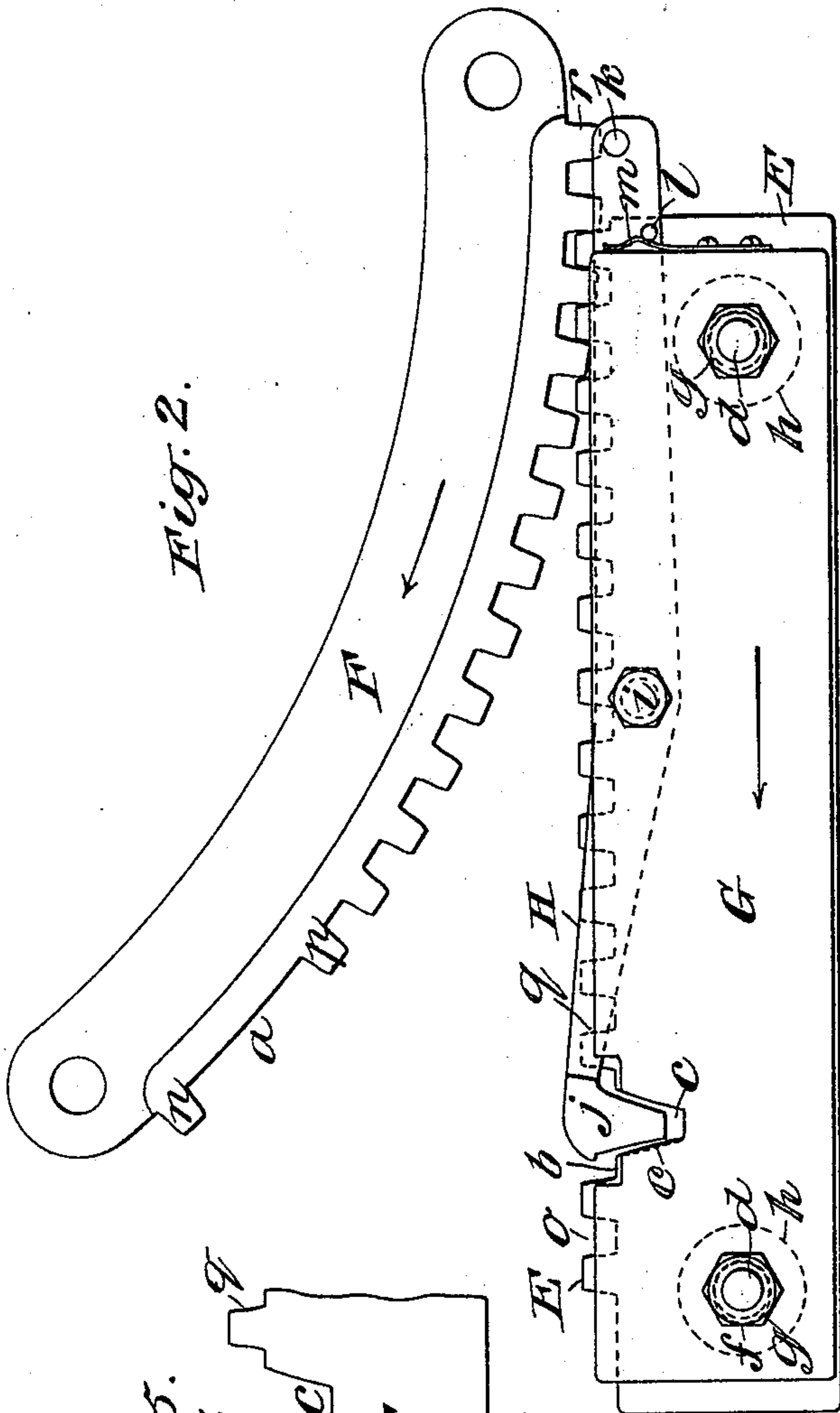
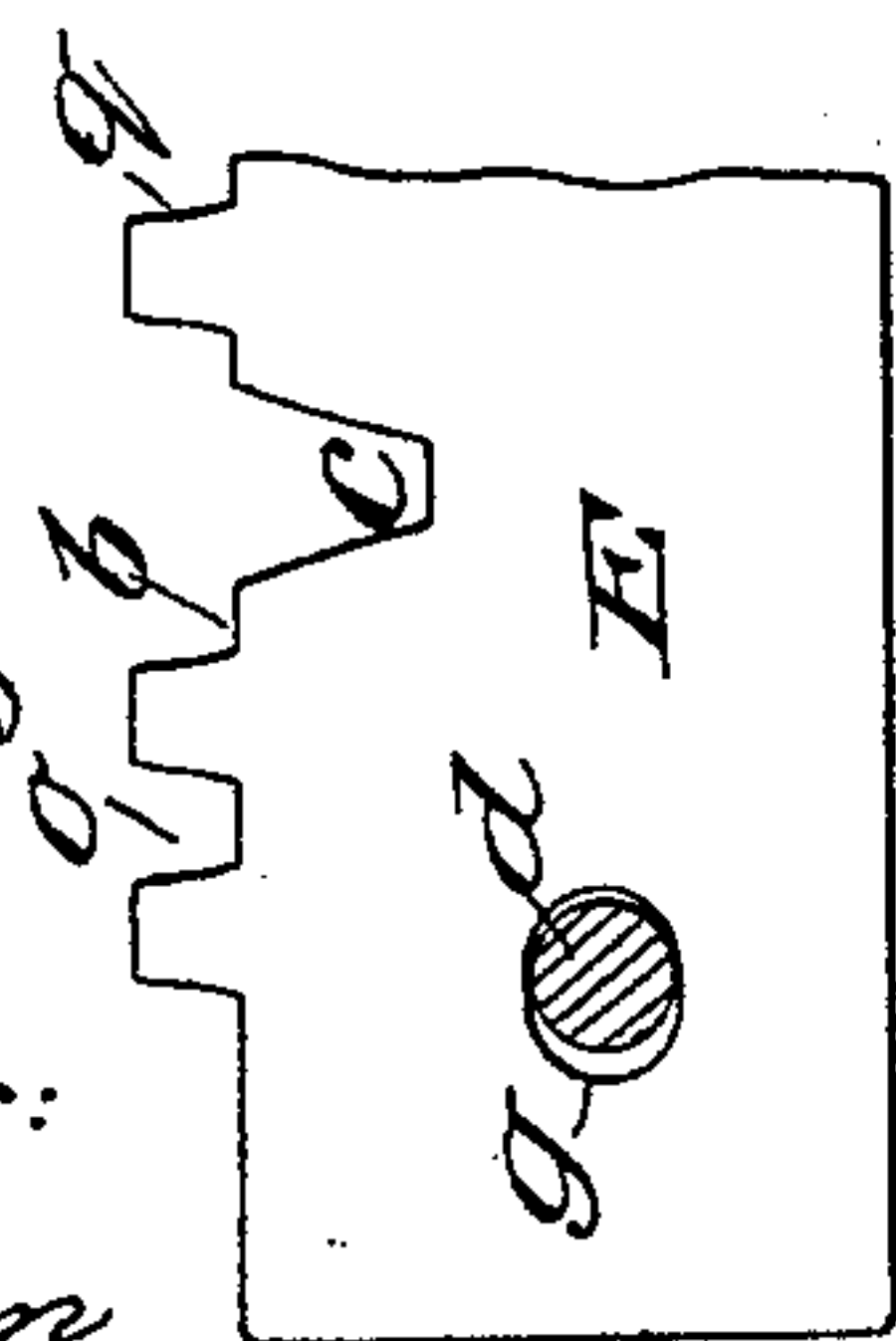
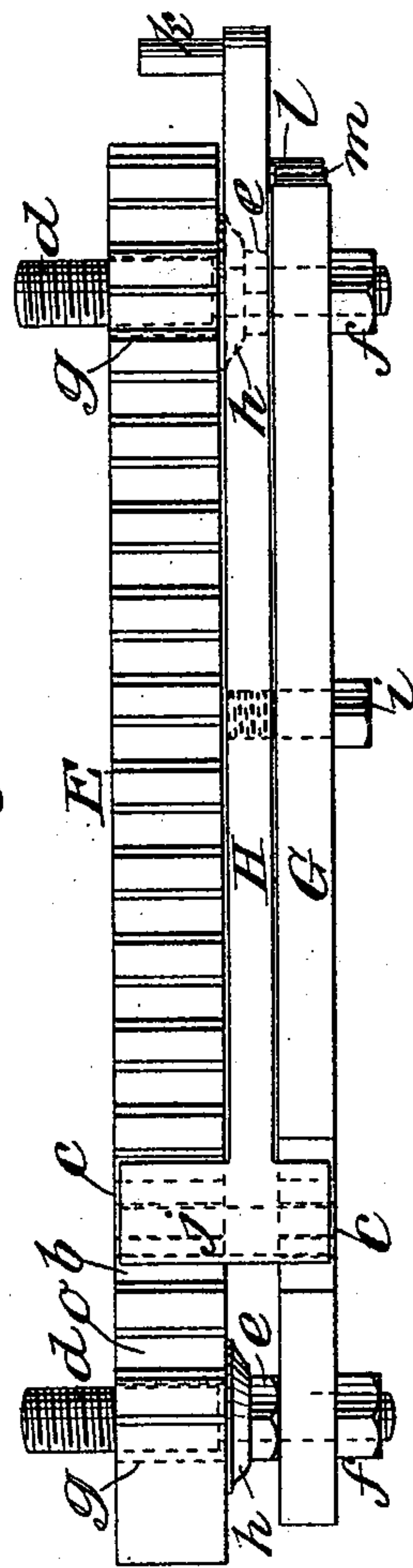


Fig. 5.



Witnesses:  
O. Sundgren  
George Barry.

Fig. 4.



Inventor:  
Charles P. Cottrell  
by attorneys  
Brown & Howard



# UNITED STATES PATENT OFFICE.

CHARLES P. COTTRELL, OF STONINGTON, CONNECTICUT, ASSIGNOR TO THE  
C. B. COTTRELL & SONS COMPANY, OF WESTERLY, RHODE ISLAND, AND  
NEW YORK, N. Y.

## PRINTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 517,973, dated April 10, 1894.

Application filed November 24, 1893. Serial No. 491,842. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES P. COTTRELL, of Stonington, in the county of New London and State of Connecticut, have invented a new and useful Improvement in Printing-Machines, of which the following is a specification.

This invention relates to what is known as registering gearing used in flat bed cylinder printing machines to bring the cylinder and bed into proper register as they come again into gear with each other after having been disengaged. This registering gearing consists of a toothed segment on the cylinder and a short toothed rack on the bed by which the cylinder and the bed are engaged soon after the bed commences its return movement and continue so engaged during a part of the return movement of the bed.

The object of this invention is to prevent the thumping which very commonly occurs with such gearing as commonly constructed, at the time of the said gearing coming into engagement, by reason of slight differences in the speed of the cylinder and the bed at that time.

I will proceed to describe my invention with reference to the accompanying drawings and afterward point out its novelty in claims.

Figure 1 represents a longitudinal elevation of those parts of a perfecting printing machine necessary for the illustration of my invention, the framing being represented as broken away at one point to expose certain parts to view. Fig. 2 is a side view of the registering gearing of one cylinder on a larger scale than Fig. 1. Fig. 3 represents a transverse section corresponding with Fig. 2. Fig. 4 is a plan of the registering rack and attachments. Fig. 5 is a side view of part of the rack and a section of one of its attaching bolts.

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

A is the framing of the machine, B the bed running on the ways provided for it on the framing, and C' C<sup>2</sup> the first and second impression cylinders.

D' D<sup>2</sup> are the first and second forms.

The cylinders are represented as geared together by gears 6, 7, and as driven from the driving shaft I through a train of gearing 8, 9, 10, 11, 12, the first gear 8 being on the driving shaft and the last one 12 gearing with the gear 6 on the second impression cylinder C<sup>2</sup>. As this means of driving the cylinder is old and well known it needs no further description.

The bed is represented as driven in a well known manner by a mangle wheel J and a mangle rack K, the said wheel J being on the oscillating section L' of the mangle shaft L L', the other section L of which working in stationary bearings has upon it the gear 9 which derives motion from the gear 8 on the driving shaft.

E E are the racks on the bed and F F are the segments on the cylinders, which racks and segments constitute the registering gearing. The segments F F are bolted to their respective cylinders in the usual way and are like the segments commonly employed in such registering gearing except that there is a mutilation or gap *a* formed by the cutting away or omission of one or more teeth near the front end of each, that is to say, the end which points in the direction of the revolution of its respective cylinder and first comes into gear with its respective rack. In the example represented the gap is equal to two teeth and the spaces between, in front of and behind them. The racks E E are like those commonly employed except that they have a gap *b* formed by the omission of a tooth near that end of each which first comes into gear with its respective segment, and there is a notch *c* formed at the bottom of this gap, and instead of being fixedly bolted to the bed they are bolted thereto loosely by stud bolts *d* and nuts *e f* in such manner that they are capable of a limited movement only lengthwise of the bed. The said stud bolts are screwed fixedly into the side of the bed and the rack is provided, for the reception of the said bolts, with holes *g* which are slightly elongated in a horizontal direction as shown in Fig. 5 and dotted in Figs. 2 and 4. The nuts *e* which are screwed on to the said bolts to secure the rack close to the bed have be-



tween them and the rack, cup-shaped elastic washers *h* which produce a desirable degree of friction between the bed and the racks while permitting the movement of the latter as will be hereinafter described.

Outside of and parallel with the rack E, there is affixed rigidly to the bed B, a plate G which carries the fulcrum pin *i* of a locking lever H which is arranged between the said plate and the rack for engaging the rack with the said plate and thereby securing the rack rigidly to the bed. The said plate G is carried by the stud bolts *d* and secured thereon by the nuts *f* on the outer ends of the said bolts which hold it firmly against the nuts *e* of said bolts, the holes provided in the said plate being of a size to fit snugly on the said bolts. The locking lever H has at one end a T-head *j* as shown in Fig. 4, one branch of which, as shown in Fig. 4, enters the gap *b* and notch *c* of the rack and the other branch enters a notch *c* in the plate G, the said notches *c* being tapered and the T-head of the lever being correspondingly wedge-shaped as shown in Fig. 2, so that by a downward movement of the lever the said T-head may enter tightly into both notches *c c* and so lock the rack firmly to the plate G and thereby lock it positively to the bed in correct relation thereto, and that by an upward movement the said T-head may leave space enough between it and the notches to permit the rack to move a short distance lengthwise of the bed. Near the opposite end of the locking lever H to the T-head, which end projects beyond the rack and the locking plate G, there is a lateral projection represented as a pin *k* which is to be acted upon by a tripping device on the cylinder as for example, the last tooth *r* or the rear portion of the segment F, for the purpose of lifting the T-head of the locking lever high enough to loosen the rack from the locking plate. There is also near the said part of the lever which projects beyond the locking plate G, a pin *l* which, as the lever moves up and down, passes above and below a rounded portion of a spring *m* which is secured to the locking plate for the purpose of holding the locking lever either in the position shown in Fig. 2 in which the rack is free or in the position in which it is locked positively to the bed. The operation of this registering gearing will now be described with reference to the example in connection with the first impression cylinder C' which is that represented in detail in Figs. 2, 3, 4, and 5. The rack and segment come together, moving in the direction of the arrows marked upon them, the first tooth *n* of the segment entering the first space *o* of the rack while the rack is loose on the bed, and if the segment and rack are not in correct relation the rack will have a sufficient though very slight longitudinal movement on the bed under the control of the segment to bring the cylinder and bed into proper

register without any shock. By the time the next tooth *p* of the segment enters the space *q* of the rack the untoothed portions *a* of the segment will have pushed the wedge-shaped head *j* of the locking lever down into the notches *c c* of the rack and locking plate and will have thus brought the rack solid with the bed in which condition the rack will remain during the early part of the printing. As the rack passes out of the segment the tooth *r* or rear portion of the latter strikes and depresses the pin *k* of the locking lever and thus tips or lifts the said lever in the notches *c* of the rack and locking plate high enough to free the rack for the next operation. If in the above described operation the rack should not be brought by the segment into the correct position it will be brought to that position with certainty by the action of the wedge-like head of the locking lever in the notches of the rack and locking plate.

It will be observed by reference to Fig. 1, that the rack E and segment F of the second impression cylinder and second form have their positions reversed as compared with those of the first impression cylinder the operation of which I have just described, as they operate during the movement of the bed in the opposite direction; but their operation except as to the direction during which it takes place will be the same as that described.

This improvement is obviously applicable to printing machines in which only one impression cylinder and one form are employed.

What I claim as my invention is—

1. The combination with the rotary impression cylinder and reciprocating bed in a printing machine and means of separately driving said cylinder and bed, of a registering segment fast on the impression cylinder, a loose registering rack movable lengthwise on the bed, and a locking device for locking the said rack to the bed in such engagement with the segment as to produce a proper register between the bed and cylinder, substantially as herein set forth.

2. The combination with the impression cylinder and the bed, of a segment on the said cylinder, a rack movably attached to the bed, a locking device for engaging the rack to the bed to register with said segment and a tripping device attached to the cylinder for tripping the said locking device and leaving the rack free to move on the bed, substantially as herein set forth.

3. The combination with the impression cylinder, the bed, a segment on the cylinder, a notched rack movable lengthwise on the bed, a notched locking plate affixed rigidly to the bed, and a locking lever attached to the bed and having a wedge-shaped portion for engaging with the notches in the rack and locking plate to bring the said rack in proper relation to the bed and lock it in such relation, substantially as herein set forth.

4. The combination of the bed provided



with fixed bolts *d*, the notched rack E, and  
notched locking plate G, both supported on  
said bolts, the rack movable and the locking  
plate fixed on said bolts, the locking lever H  
5 fulcrumed in said locking plate and having  
wedge-shaped portions for engaging respect-  
ively with the notches in the said rack and

locking plate, substantially as and for the pur-  
pose herein set forth.

CHARLES P. COTTRELL.

Witnesses:

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B. FRANK LAKE.