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S. L. MORGAN.

INKING MECHANISM FOR PRINTING PRESSES.

APPLICATION FILED AUG. 19, 1905.

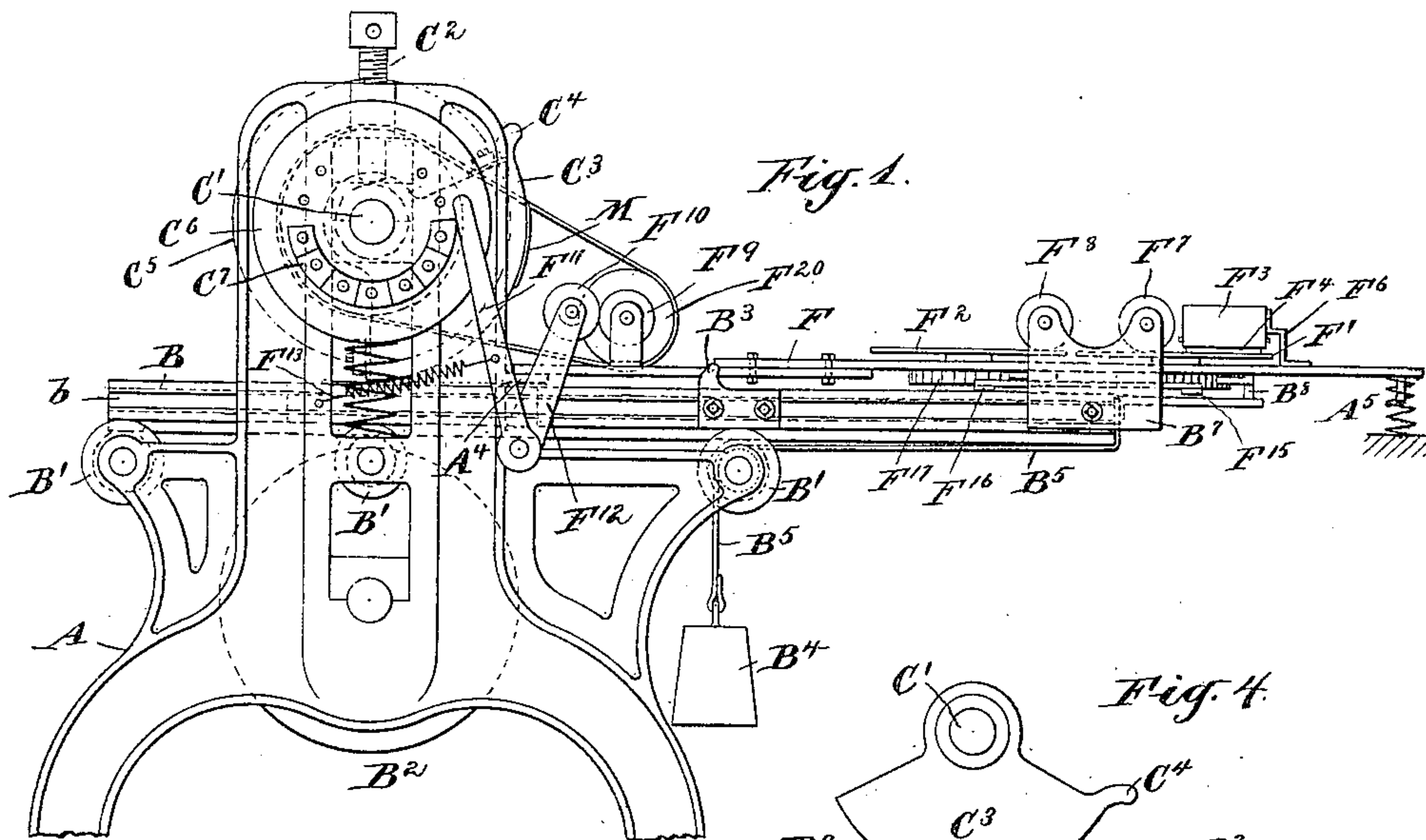


Fig. 1.

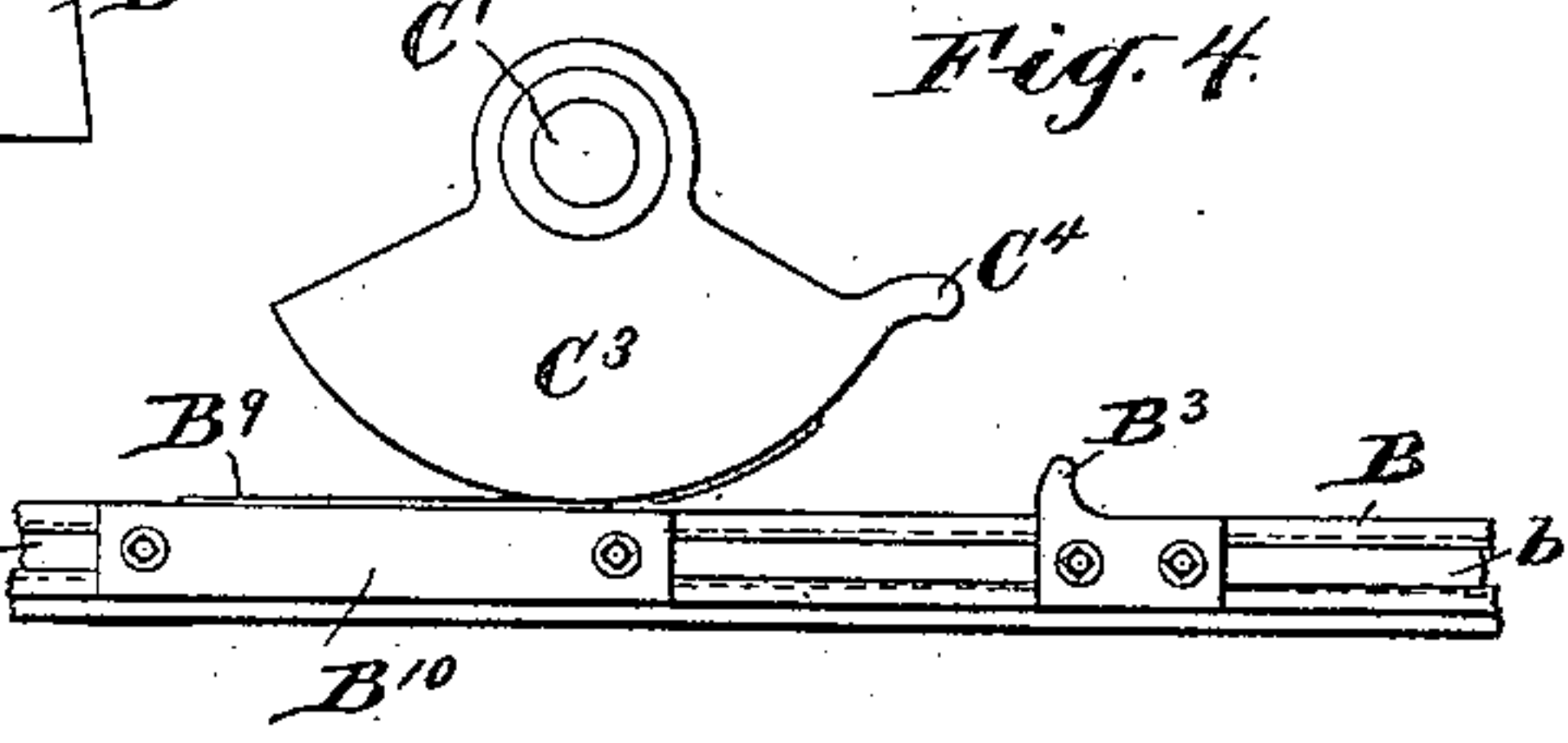


Fig. 4.

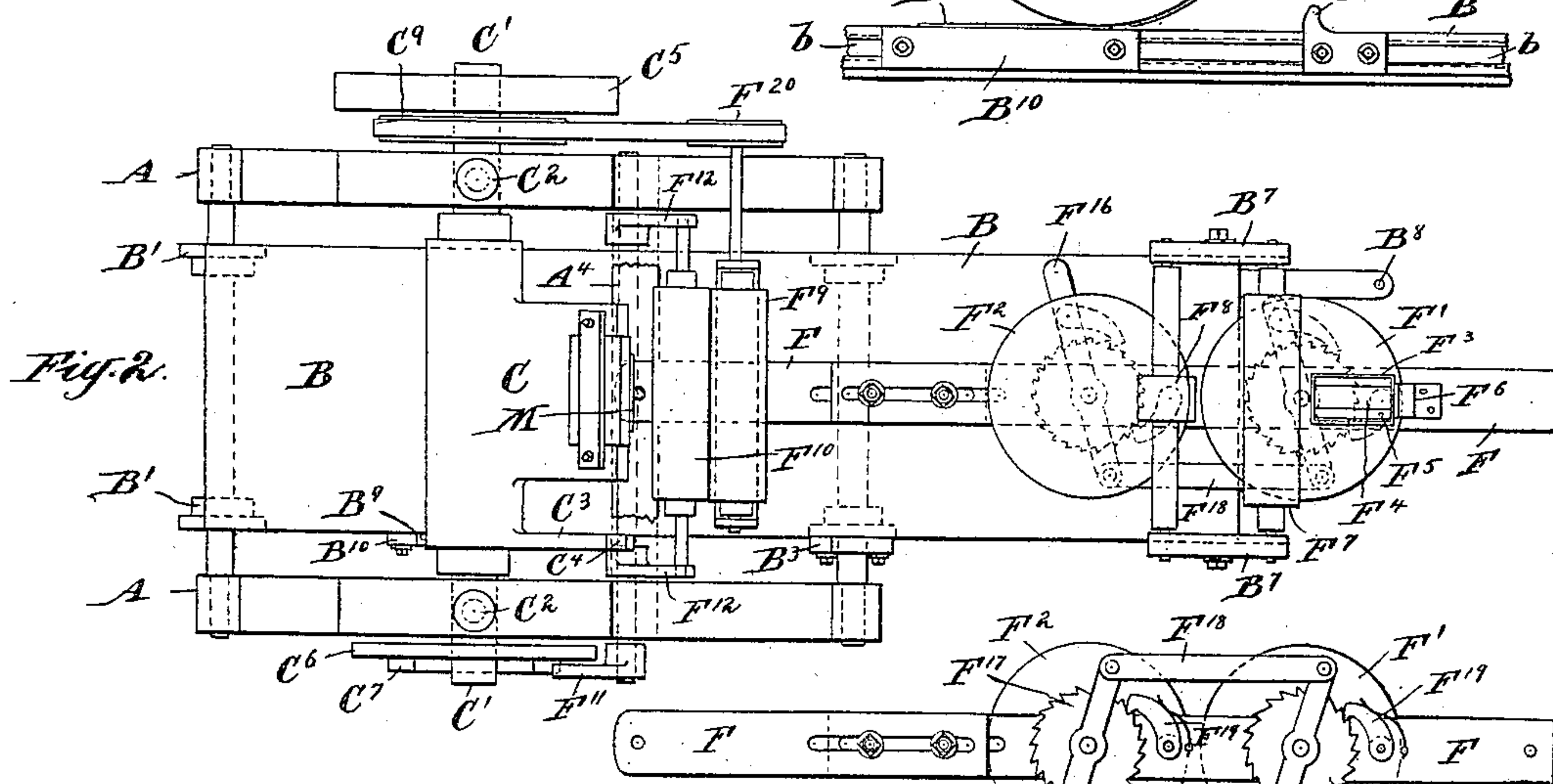


Fig. 2.

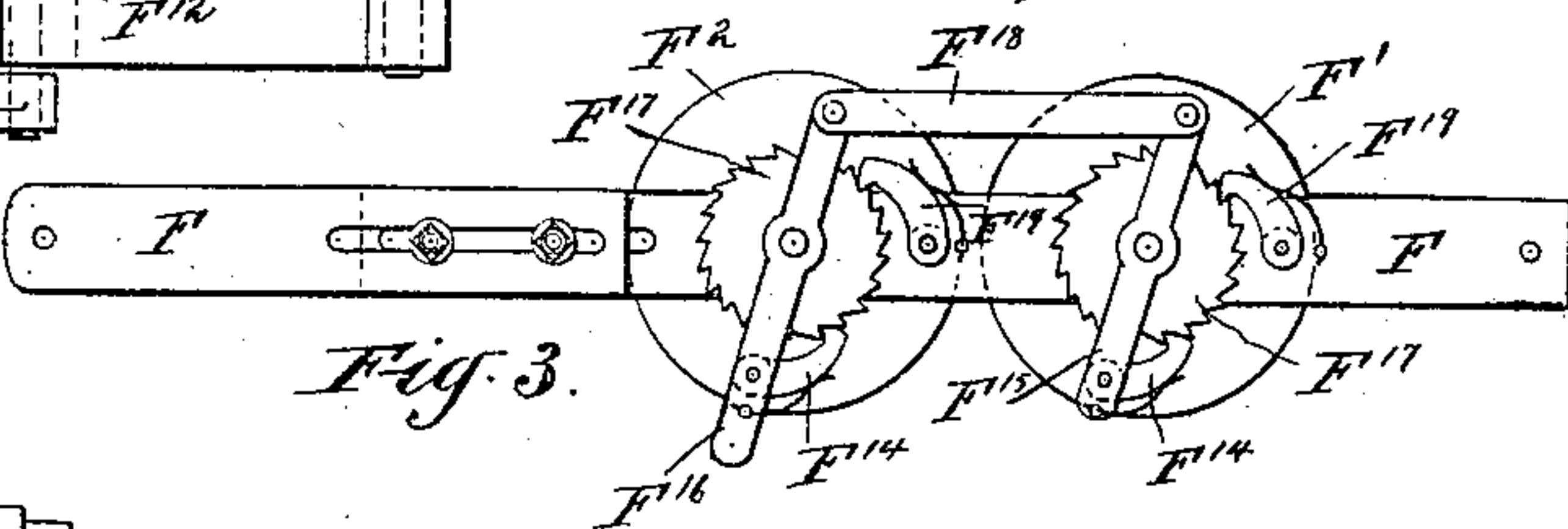


Fig. 3.

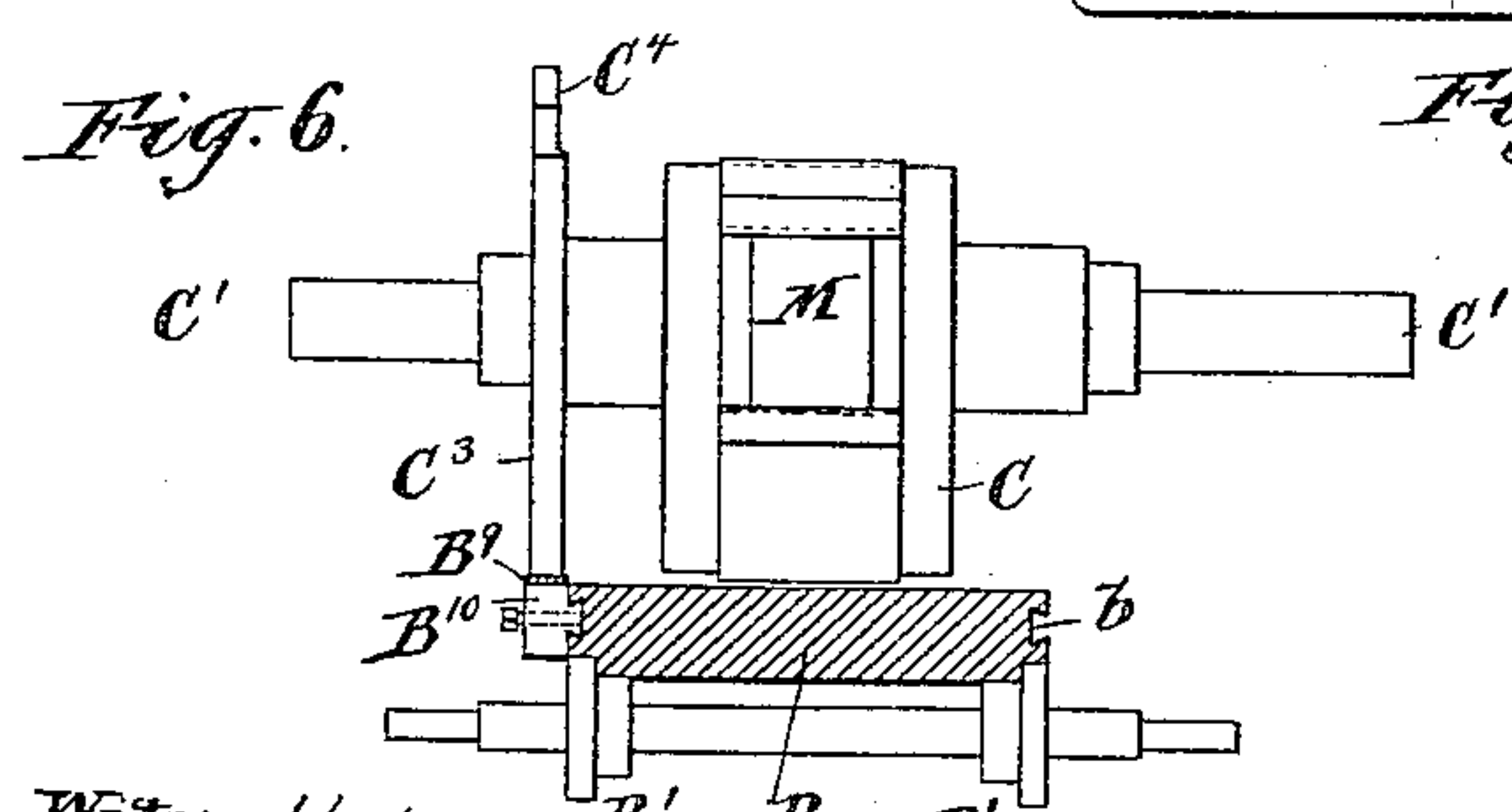


Fig. 6.

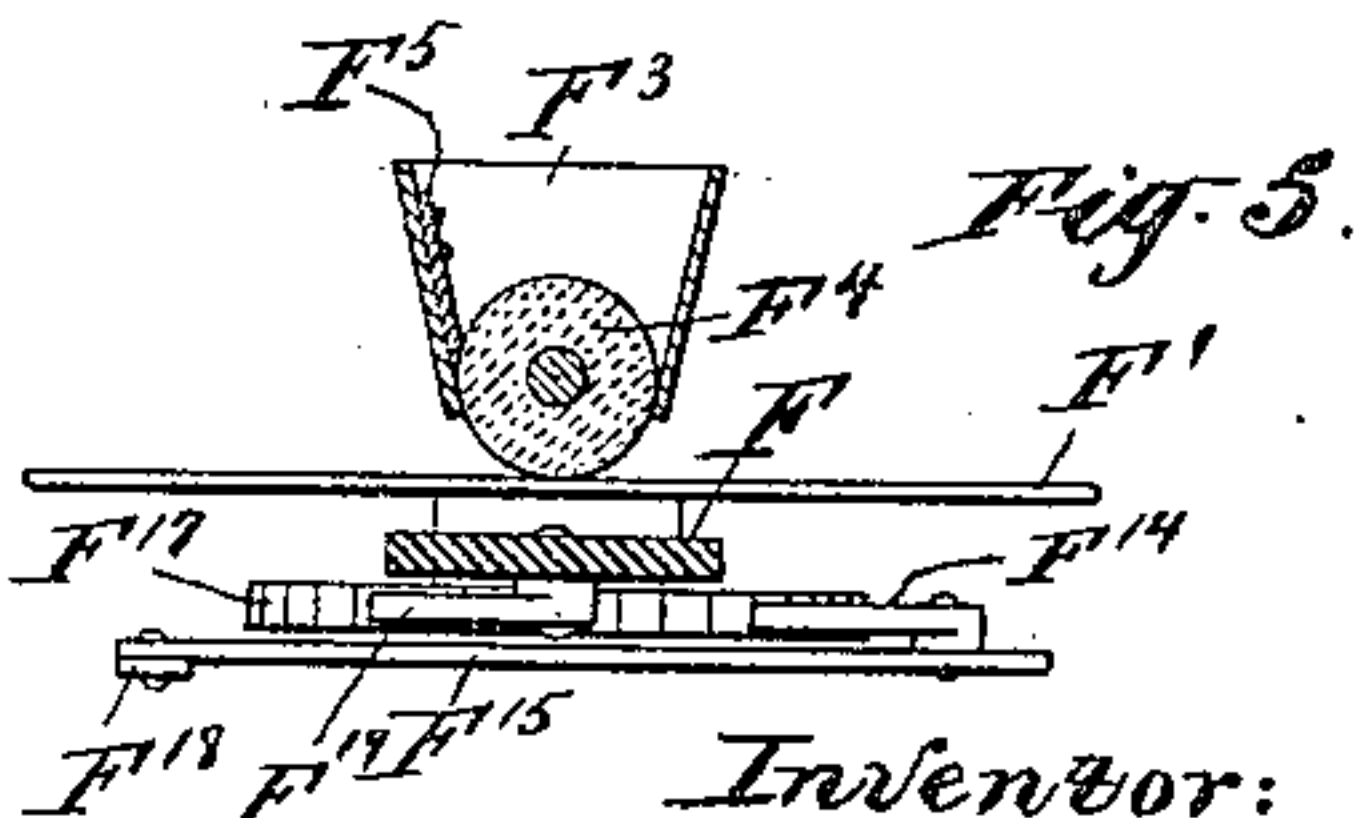


Fig. 5.

Witnesses:
Omar C. Glackner
C. L. Meyers.

Inventor:
Stephen L. Morgan,
by his attorney,
Charles R. Deane.

UNITED STATES PATENT OFFICE.

STEPHEN L. MORGAN, OF RUTHERFORD, NEW JERSEY.

INKING MECHANISM FOR PRINTING-PRESSES.

No. 824,191.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, STEPHEN L. MORGAN, a citizen of the United States, residing in Rutherford, in the county of Bergen and State of New Jersey, have invented a certain new and useful Improvement in Inking Mechanisms for Printing-Machines, of which the following is a specification.

The invention relates to means for automatically supplying ink to printing-machines, and is designed more particularly to serve with plate-printing presses in which the printing-surface is carried on a printing-roller arranged to contact with the material to be printed upon carried on a reciprocating bed or "plank."

The object of the invention is to provide a simple automatic inking mechanism conveniently located and easily and economically operated both as regards consumption of power and the quantity of ink used.

The invention consists in certain novel features and details of construction by which the above objects are attained, to be hereinafter described.

The accompanying drawings form a part of this specification and show a preferred form of the invention.

Figure 1 is a side elevation of the working parts of a D-roller plate-printing press equipped with the improved inking device. Fig. 2 is a plan view of the same. Fig. 3 is a corresponding view from below, showing a portion of the inking mechanism alone. Fig. 4 is a side elevation of certain parts employed in the reciprocation of the bed. Fig. 5 is an end view, partly in vertical section, showing a portion of the inking mechanism on a larger scale. Fig. 6 is a rear elevation, partly in vertical section, showing the D-roller and certain immediately-adjacent portions.

Similar letters of reference indicate the same parts in all the figures.

The machine illustrated is on the lines of an ordinary D-roller press altered to conform to the requirements of the invention and may be understood to be driven by power applied to the shaft of the D-roller.

The frame is marked A and comprises two vertical side frames, between which is mounted a reciprocating bed or plank B, supported on antifriction-rollers B' B', journaled in the frames. Below the plank is a strong supporting-roller B², mounted in bearings in the side frames, and above the plank is the segmental printing or D roller C on a shaft C',

extending through boxes guided in vertical slots in the frames, supported on springs and adjusted toward and from the upper face of the plank by screws C². Connected with the D-roller is a segmental flange C³, corresponding to the contour of the D-roller and lying just beyond the margin of the plank. This flange carries an arm C⁴, adapted to strike a lug B³, adjustably secured to the edge of the plank and initiate the movement of the latter in opposition to the gravity of a weight B⁴, tending to return the plank and suspended from a strap B⁵, attached to the rear end of the plank and running on a pulley loosely mounted on the shaft of the rear rollers B'.

The engraved plate or analogous printing-surface (marked M) is mounted in any suitable manner upon the convex face of the D-roller, to which it is curved to conform, and the card or other surface to be printed upon is placed on the plank and receives the impression in its passage under the D-roller.

The inking device is placed horizontally in rear of the D-roller, and the ink is supplied, distributed, and delivered by mechanisms operated by the reciprocations of the plank and having certain portions directly connected thereto. F is flat bar in two portions lapped one upon the other and joined by bolts extending through slots in each, by which the length of the bar may be varied as required. The bar extends rearwardly from a transverse brace A⁴ between the side frames and is supported at the rear end upon a spring A⁵ or other slightly-yielding support. On the upper face of the bar, near the rear end, are two horizontal disks or circular ink-plates F' F², having central studs extending through the bar and serving as journals with which the plates rotate. The rearmost, F', has an ink-fountain F³, in which is a fountain-roller F⁴, rotated by its frictional contact with the plate and delivering ink thereto from a supply in the fountain, controlled by a scraper F⁵. The fountain is supported by a bracket F⁶, attached to the bar F and overhanging the rear portion of the ink-plate.

In adjustable housings or brackets B⁷ on the edges of the plank is carried a pair of ink-distributing rollers F⁷ F⁸, which at each reciprocation of the plank traverse the inner ink-plate F² and one, the roller F⁷, partially traverses the ink-plate F', taking ink therefrom and delivering it to the plate F², whence it is carried by the roller F⁸ to a revolving roller F⁹ mounted in stationary

bearings on the bar F. From the roller F⁹ the ink thus uniformly distributed is taken by an oscillating roller F¹⁰ and presented at proper intervals in the path of the printing-plate M.

The oscillations of the roller F¹⁰ are induced by the action of one or more removable sections or blocks C⁷, arranged segmentally on a disk C⁶, carried on the overhanging end of the shaft C' and serving as a cam working against an arm F¹¹ on the swinging frame F¹², in which the roller F¹⁰ is mounted. The series of blocks holds the roller F¹⁰ against the roller F⁹ in opposition to the force of a spring F¹³, which on the release of the arm F¹¹ swings the roller into contact with the plate M. A greater or less number of blocks C⁷ correspondingly increases or diminishes the length of the cam, and thus permits the period of contact of the roller F¹⁰ with the plate to be varied, and also by changing the positions of the blocks allows the period of contact to be adjusted to the position of the plate on the D-roller.

The ink-plates F¹ F² are slowly rotated step by step by pawls F¹⁴ F¹⁴, carried by arms F¹⁵ F¹⁶ and engaging the ratchet-wheels F¹⁷ F¹⁷ beneath the bar F. The required swing of the arms is imparted by the contact with the longer arm F¹⁶ of a pin B⁸, carried by the plank, and the motion thus produced is transmitted to the shorter arm F¹⁵ by a link F¹⁸. The ink-plates are held against movement in the reverse direction by pawls F¹⁹ on the under face of the bar F, engaging with the same ratchet-wheels, as will be understood.

It is important to the successful operation of the inking mechanism that the plank make a complete or nearly complete reciprocation at each revolution of the D-roller irrespective of the length of plate M, so that the ink-rollers F⁷ F⁸ shall make the required traverse of the ink-plates, and it is also imperative that the plank be entirely free to move at a rate determined by the peripheral travel of the plate during the impression. These conditions are secured by the frictional contact of the flange C³ with a surface on an adjustable block B¹⁰ on the plank. The block has a dovetailed rib matching a similarly-shaped groove *b* in the edge of the plank and is held in the desired position by screws B¹¹. On the upper face of the block is secured a strip B⁹ of leather or other material, and the block is so located relatively to the position of the plate M on the D-roller as to present the rear end of the strip B⁹ in position to be frictionally engaged by the periphery of the flange C³ at the instant the impression is completed, (see Fig. 4,) and the surface B⁹ is of sufficient length to insure such frictional engagement during the whole travel of the remaining portion of the segmental periphery, thus causing a sufficient

rearward movement of the plank without interfering with the natural movement of the plank while the impression is being made. By adjusting the block B¹⁰ in the groove *b* the frictional surface may be moved to complete the reciprocation for any length of printing-plate. The plank returns automatically when released by the action of the weight B⁴.

The grooves *b b* along the edges of the plank also receive the lug B³ and the housings B⁷, carrying the bearings for the rollers F⁷ F⁸, and permit these parts to be adjusted forwardly and rearwardly, as found necessary.

I have shown the shaft C' of the D-roller as equipped with a pulley C⁵, by which continuous rotary movement may be imparted; but it will be understood that the shaft may be otherwise driven by power or may be turned by hand. Rapid rotation is imparted to the ink-roller F⁹ by a belt running on a pulley F²⁰ on its shaft and a pulley C⁹ on the D-roller shaft. Gearing may be employed or the ink-roller driven from a counter-shaft. (Not shown.)

The several ink-rollers may be all of sufficient length to supply ink to the widest plate; but I prefer to use a roller F⁸ of a length conforming approximately to the width of the engraved portion of the plate to be printed, for the reason that a saving in the amount of ink applied is thus effected and less required to be removed in the wiping operation, which with the polishing may be understood for the purposes of this invention to be by hand. Another advantage due to the use of the short roller F⁸ is an increased uniformity in applying ink to the plate. For example, if a full-length roller be substituted for the short roller F⁸ it will be seen that the succeeding rollers will tend to "build up" or increase in diameter uniformly by accretion, excepting the swinging roller F¹⁰, which by continually losing its ink in a band or zone corresponding to the width of the plate becomes gradually higher at each side of such zone. Thus conditioned the higher parts of the swinging roller continue to build up and tend to hold the low part or zone away from the surface of the revolving roller, and such zone does not receive and deliver to the plate the proper allowance of ink. The employment of the short roller F⁸ lessens or entirely obviates this difficulty by supplying the ink to those portions only of the rollers F⁹ and F¹⁰ from which they again deliver it.

The spring A⁵, supporting the bar F, provides the yielding quality necessary to the proper contact of the ink-distributing rollers with the ink-plates and the uniform distribution of the ink, and by operating the inking device by the reciprocations of the plank the mechanism is simplified and favorably presented for supervision by the attendant.

The bar F and its attachments may be removed by simply disconnecting it from the brace A⁴ and withdrawing it beneath the rollers, and the adjustability of the bar permits it to be lengthened or shortened and the position of the ink-plates relatively to the rollers F⁷ F⁸ changed, as may be found necessary or desirable.

Modifications may be made in the forms and arrangements of the parts in adapting the invention to other forms or styles of presses, and parts of the invention may be used without the whole.

I claim—

1. In a machine of the character set forth, a printing-roller and a reciprocating plank, ink-plates supported independently of said plank and above the latter, and distributing-rollers arranged to traverse said plates and carried by said plank.

2. In a machine of the character set forth, a printing-roller and a reciprocating plank, ink-plates supported above said plank, distributing-rollers arranged to traverse said plates and carried by said plank, and an oscillating roller actuated by the revolutions of said printing-roller, arranged to receive ink from said distributing-rollers and deliver it to said printing-roller.

3. In a machine of the character set forth, a reciprocating plank, a bar extending longitudinally of and above said plank, an ink-plate carried on said bar, means for revolving said ink-plate by the reciprocations of said plank, a distributing-roller carried by said plank and arranged to traverse said ink-plate, a relatively stationary revolving roller receiving ink from said distributing-roller, and a moving roller arranged to contact alternately with said revolving roller and a printing-surface.

4. In a machine of the character set forth, a printing-roller, a reciprocating plank, a bar extending longitudinally of and above said plank, a yielding support for said bar, and an ink-plate carried on said bar, distributing-rollers carried by said plank and arranged to traverse said ink-plate, and means for delivering ink from said distributing-rollers to a printing-surface on said printing-roller.

5. In a plate-printing machine, a printing-roller adapted to carry plate-printing surfaces of different widths, an ink-plate and means for supplying ink thereto, a long distributing-roller and a short distributing-roller arranged to traverse said ink-plate, and a roller adapted to receive ink from said short roller and deliver it to the printing-surface, said short roller having a length corresponding to the width of said printing-surface,

whereby the ink required for such printing-surface will be received thereon in a narrow strip.

6. In a plate-printing machine, a printing-roller adapted to carry plate-printing surfaces of different widths, a reciprocating plank, an ink-plate and means for supplying ink thereto, a long distributing-roller and a short distributing-roller carried by said plank and arranged to traverse said ink-plate, a long relatively stationary revolving roller arranged to receive ink from said short roller, and a long oscillating roller arranged to receive ink from said revolving roller and transfer it to the printing-surface, the said short roller having a length corresponding to the width of such printing-surface, whereby those portions of said revolving roller and oscillating roller corresponding to the zone of contact of said short roller will be built up by the accumulation of ink thereon, and the deposition of ink on such printing-surface restricted to a narrow strip proportionate to the length of said short roller.

7. A reciprocating plank, a D-roller, a stationary bar arranged longitudinally of said plank, an ink-plate on said bar, and distributing-rollers carried by said plank and arranged to coact with said ink-plate.

8. A reciprocating plank, a D-roller, a stationary bar arranged longitudinally of and above said plank, an ink-plate carried by said bar, means actuated by said plank for rotating said plate, and ink-distributing rollers carried by said plank and arranged to coact with said ink-plate.

9. A reciprocating plank, a D-roller, a stationary bar arranged longitudinally of and above said plank, means for yieldingly supporting said bar, an ink-plate carried by said bar, means actuated by said plank for rotating said plate, and ink-distributing rollers carried by said plank and arranged to coact with said ink-plate.

10. A reciprocating plank, a D-roller, a stationary bar arranged longitudinally of and above said plank, an ink-plate carried by said bar, means actuated by said plank for rotating said plate, an ink-fountain carried by said bar and having a fountain-roller actuated by the rotation of said plate, and ink-distributing rollers carried by said plank and arranged to coact with said ink-plate.

In testimony that I claim the invention above set forth I affix my signature in presence of two witnesses.

STEPHEN L. MORGAN.

Witnesses:

CHAS. A. HAUCK,
CHARLES R. SEARLE.