

No. 811,674.

PATENTED FEB. 6, 1906.

C. E. STEERE.
DUPLICATING MACHINE.

APPLICATION FILED JAN. 19, 1905.

4 SHEETS—SHEET 2.

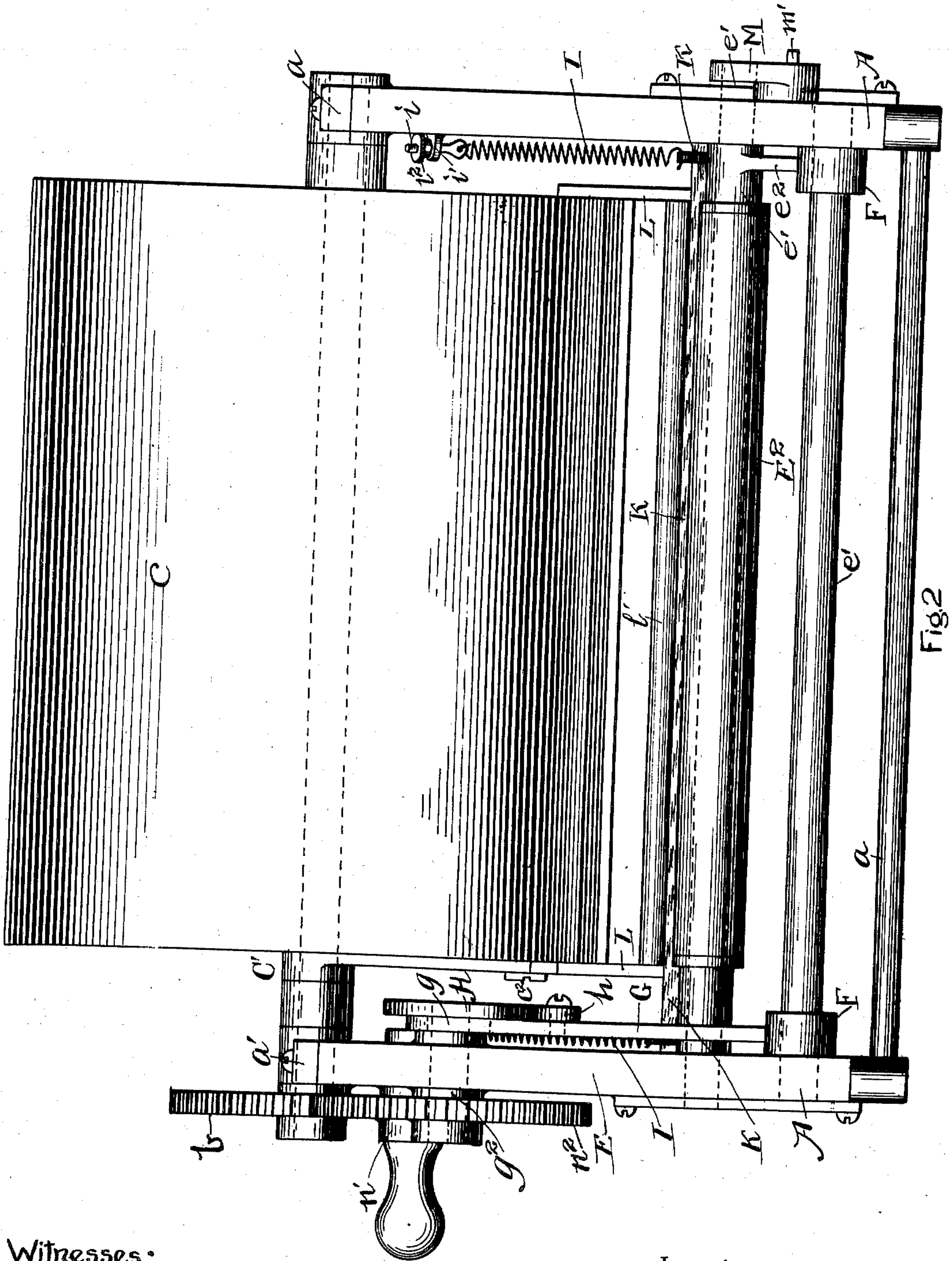


Fig. 2

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J. M. Bunnell

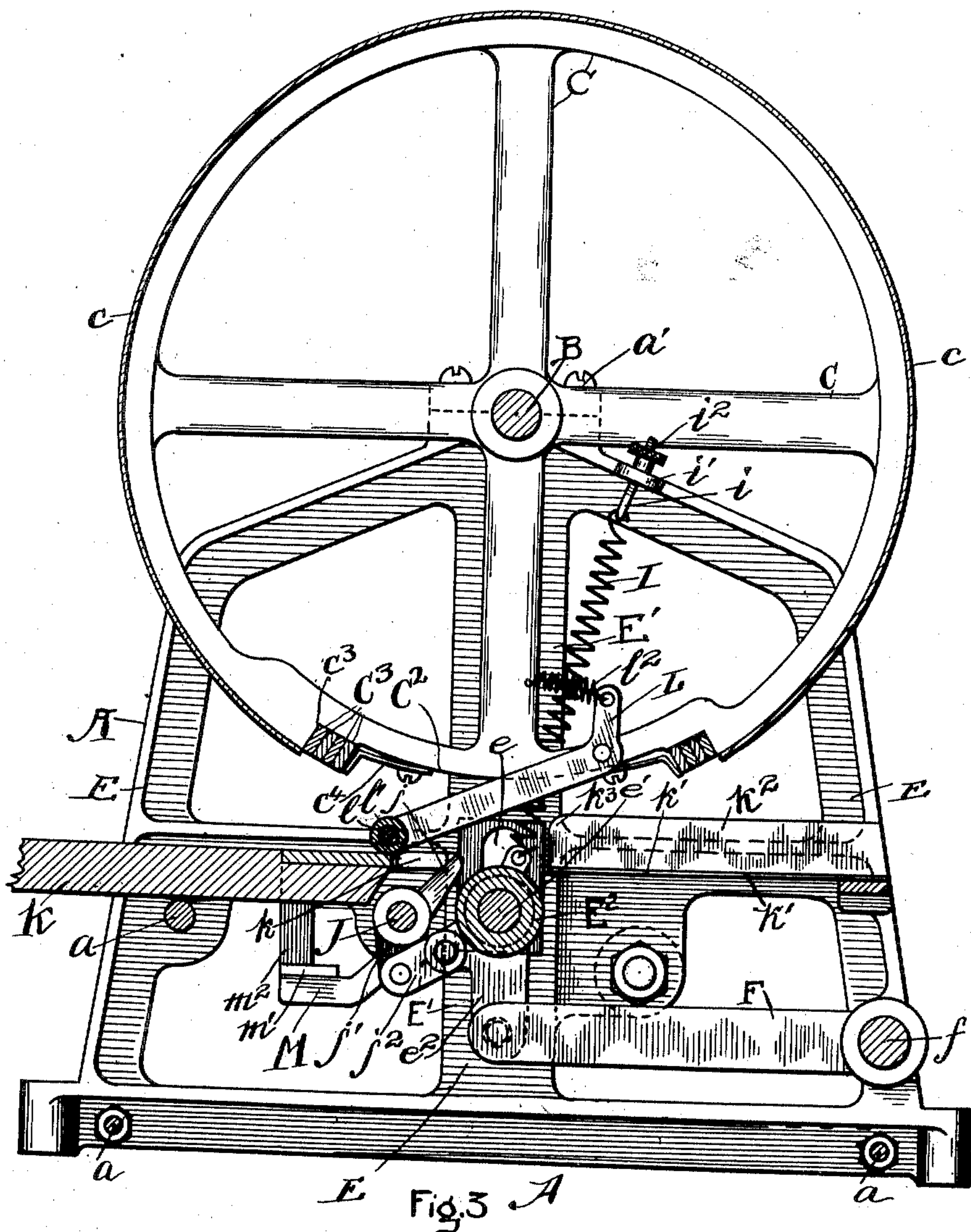
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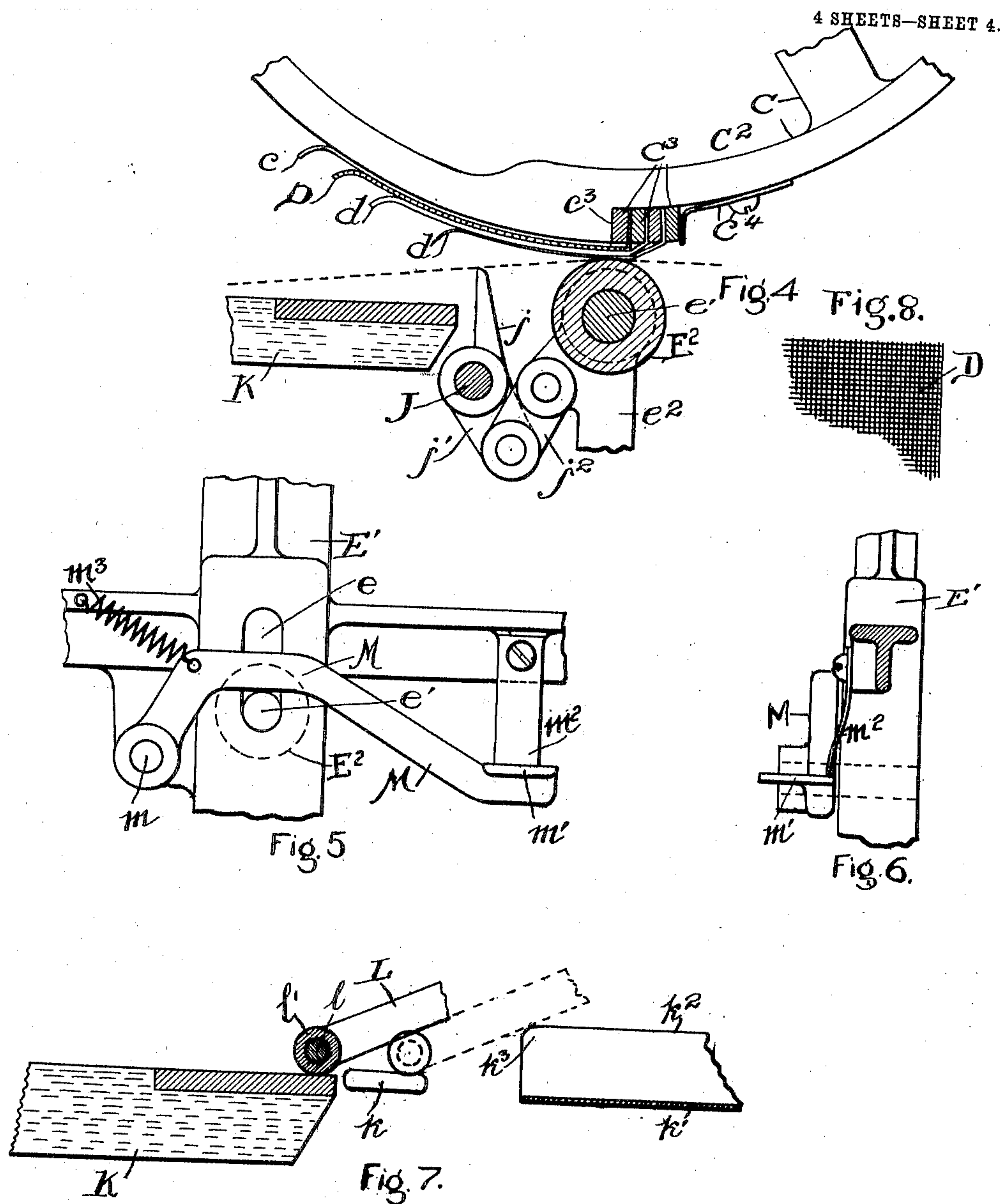
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F. A. Lundquist

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UNITED STATES PATENT OFFICE.

CLARENCE E. STEERE, OF MAYWOOD, ILLINOIS, ASSIGNOR TO A. B. DICK COMPANY, A CORPORATION OF ILLINOIS.

DUPLICATING-MACHINE.

No. 811,674.

Specification of Letters Patent.

Patented Feb. 6, 1906.

Application filed January 19, 1905. Serial No. 241,848.

To all whom it may concern:

Be it known that I, CLARENCE E. STEERE, a citizen of the United States, residing at Maywood, Cook county, Illinois, have invented certain new and useful Improvements in Duplicating-Machines, of which the following is a specification.

My invention relates to duplicating-machines, and has for its object improvements in the construction and operation of such machines.

In the drawings illustrating the invention, Figure 1 is a side elevation of the entire device; Fig. 2, an end elevation of the same; Fig. 3, a cross-sectional elevation; Fig. 4, a detail of the cylinder and stop mechanism; Fig. 5, a detail of the mechanism for positioning the printing-roller; Fig. 6, a cross-section of the device of Fig. 5; Fig. 7, a detail of the feed mechanism, and Fig. 8 an enlarged detail of a portion of the ink-containing gauze.

The device is mounted upon a framework consisting of end brackets or supports A, connected together by means of suitably-disposed cross-rods *a*, and upon the brackets are journal-boxes *a'*, which serve as a mounting for a journal-shaft B, which extends from end to end of the machine and has secured to it at one end a gear-wheel *b*. (Best shown in Fig. 1.) The gear-wheel is located outside of the supporting-brackets, and between the brackets are a pair of cylinder-wheels or spiders C, loosely mounted on the journal-shaft, which wheels or spiders are connected by means of a smooth impervious metallic covering in the form of a split cylinder *c*—that is, one which extends nearly around the periphery of the wheels, leaving a longitudinally-extending open space or gap at one side. A rigid connection between the wheels or spiders and the shaft is effected through the medium of an arm *C'*, which is rigidly mounted on the shaft and provided at its outer end with an elongated slot *c'*, through which passes an adjustable set-screw *c''*, which enables the split cylinder as a whole to be adjustable with respect to the shaft. The rims of the wheels or spiders are provided with recesses *C''* in line with the gap in the cylindrical covering, and said recesses provide shoulders *c''*, against which abut a series of four bars or plates *C''*, which are held in place by the pressure of a spring *c''*. Superimposed upon the impervious metallic cov-

ering *c* is a pervious or perforate covering D, preferably of wire-gauze, and the meshes or perforations in the gauze, when superimposed upon the impervious metallic covering *c*, serve to form a series of separate wells or reservoirs for the retention of ink. Outside of the gauze is a perforate ink-absorptive covering or sheet *d*, such as cloth, and upon the cloth covering is laid a stencil-sheet *d'* of the usual character. The ends of the several coverings outside of the interior metallic covering are adapted to be clasped and held between the longitudinally-extending bars, which may be removed under the tension of the spring *c''*, releasing the several coverings.

Each of the end brackets of the frame consists of side arms or braces E and a central upright support *E'*, which latter is provided with a slot *e*, and between the slots in the two brackets extends a slidably-mounted roller-shaft *e'*, upon which is mounted a feeding-roller *E''*, of rubber or other suitable material. Depending from the roller-shaft, at opposite ends thereof and inside of the brackets, are a pair of arms *e''*, to which are pivoted swinging or oscillating arms F, rigidly secured to a longitudinally-extending rock-shaft *f*, pivoted within journal-mountings *f'* at the lower end of the rear side arms or supports of the end brackets. One of the arms F has pivoted thereto and upwardly extending therefrom an actuating-arm G, which is slotted at its upper end *g* and embraces a cam-shaft *g'*, journaled in a journal-mounting *g''* near the upper end of the rear side bar or support of one of the end brackets. The cam-shaft has mounted thereon a cam H, which contacts a roller *h*, pivoted to the arm G, so that the movement of the cam serves to depress the arm G, and with it the arm F, carrying down the roller-shaft, and with it the feeding-roller, against the tension of a spring I, which is secured to the roller-shaft at one end and to an adjustable screw-threaded stem *i* at the other end, which stem passes through an ear *i'* on the end bracket and is adjustable therein by means of a thumb-screw *i''* or in any other similar manner. Forward of the roller-shaft *e'* and below the plane upon which paper is fed through the machine is a longitudinally-extending stop-shaft, suitably journaled and provided at suitable intervals with upwardly-extending stops or abutments *j*, and the stop-shaft is further provided with depending

arms j' , which are pivoted to the respective arms e^2 by means of links j^2 . This arrangement rocks the stop-shaft simultaneously with the movement of the roller-shaft. The stops are located in suitable proximity to the feed-table K, in front of which is a slightly-raised cross-bar k , and at the opposite side of the feeding-roller is a receiving-table k' , having at its ends upwardly-extending flanges k^2 , rounded at their forward edges k^3 for a purpose to be hereinafter explained.

Pivoted to the companion spider-wheels at opposite ends of the cylinder are a pair of levers L, of bell-crank form, and said levers are connected at their forward ends by a feeding-cross-bar l , having thereon a covering l' , preferably of rubber, and the opposite ends of the levers are connected, by means of springs l^2 , to the spider to which the lever is pivoted, which arrangement serves to outwardly project the rubber-covered feed-bar and allow the same to be repressed against the tension of the springs when brought into contact with the feed-table.

In order to depress the feed-roller when desired, a lever M is provided, which is pivoted at one end to an inwardly-projecting stud m and is provided at its opposite end with a flanged thumb-piece m' , adapted to be contacted by a flat spring m^2 , depending from one of the end brackets, and said lever is shaped to span the end of the lower shaft k^3 , and its return movement is effected through the medium of a coil-spring m^3 , which allows pressure to be exerted to depress the roller-shaft against the tension of the springs I, which serve to draw back the roller-shaft after pressure is released from the lever M, and the flat spring m^2 serves to hold the lever in depressed position.

The device is operated by the crank n' , and the cylinder turns, with the lower portion moving from the front toward the rear. While the cylinder is turning the operator pushes a sheet to be printed in over the table K until it strikes the stops j . Just before the cylinder reaches the position shown in Fig. 1 the rubber-covered bar l' strikes the sheet and drags it inward. At the moment when the bar l' strikes the paper or slightly before that time the cam H begins to operate on the roll h , causing a descent of the roll E^2 and a backward-tipping movement of the stops j . The backward movement of the stops j is quite rapid, thus permitting the sheet of paper to be dragged inward over the said stops and between the printing-cylinder and the roll E^2 . By the time the forward edge of the paper is fairly between these two cylindrical surfaces the bar l' strikes the cross-bar k , Fig. 7, and rises slightly. Immediately thereafter the arms L strike the flanges k^2 of the rear table k' and the bar L is raised clear of the paper. By this means the paper is re-

leased, and its feeding movement is therefore stopped until it is engaged by the printing-cylinder and the roll E^2 acting together. This last is accomplished by the cam H permitting the roll E^2 to rise. By adjustment this can occur at any part of the printing-cylinder; but ordinarily the first contact between the two will occur when the printing-cylinder is in rotary position. (Shown in Fig. 4.) From this time on the paper is fed by the rolling action of the cylinder and the roll E^2 , and the roll pressing the paper against the stencil d' , with its ink-holding backing, causes the desired printing. The rise of the roll E^2 causes the stops j to again resume their erect position, so that they are ready for the next sheet. This rising of the stops j under the sheet being fed has no effect on that sheet other than to lift it slightly from the table.

In duplicating-machines heretofore made, as far as known to me, the stopping devices for the hand-feeding of the paper have been placed to the rear of the plane running through the axes of the printing-cylinder and its co-acting roll. This necessitates feeding by hand to a position beyond this plane and makes it necessary for the printing to begin not less than some considerable predetermined distance from the edge. By putting the hand-feeding stop in front of this plane and then feeding the remainder of the preliminary sheet movement by the action of the device itself I can release the sheet at any desired point, and thus have the printing begin very close to the margin.

What I regard as new, and desire to secure by Letters Patent, is—

1. In a duplicating-machine, the combination of a stencil-carrying cylinder, means for operating said cylinder, arms pivoted to the cylinder, a feeding cross-bar connecting the ends of the arms, springs connected with the arms for outwardly projecting the feeding cross-bar, and a feeding-table adapted to have sheets of paper moved thereover to be contacted by the feeding cross-bar under tension of the springs and advanced into printing position, substantially as described.

2. In a duplicating-machine, the combination of a stencil-carrying cylinder, means for operating said cylinder, arms pivoted to the cylinder, a feeding cross-bar connecting the ends of the arms, springs connected with the arms for outwardly projecting the feeding cross-bar, a feeding-table adapted to have sheets of paper moved thereover to be contacted by the feeding cross-bar under tension of the springs and advanced into printing position, and an abutment adapted to be contacted by the feeding mechanism after the paper has been carried into printing position, substantially as described.

3. In a duplicating-machine, the combination of a stencil-carrying cylinder, a feed-

ble in suitable proximity thereto, a feeding-bar connected with the stencil-carrying cylinder and held in parallel relation thereto, springs for normally outwardly projecting the feeding-bar, stops adapted to be raised above the plane of the feeding-table in one position and to be lowered at a suitable time to allow the feeding-bar to strike a sheet of paper on the feeding-table and carry the same over the stops and into printing position, substantially as described.

4. In a duplicating-machine, the combination of a stencil-carrying cylinder, a roller slidably mounted in suitable proximity thereto, a link connected with the roller, an arm connected with the link, a cam, a connection between the arm and the cam for actuating the arm, a longitudinally-extending shaft, stops mounted thereon, a printing-table in suitable proximity to the stops, and a connection between the shaft and the link for operating the roller and stops simultaneously, substantially as described.

5. In a duplicating-machine, the combination with a stencil-carrying cylinder, and means for operating it, of a stop against which paper is fed by hand, means for removing said stop so that the paper may be advanced from the hand-fed position to a printing po-

sition, and an arm carried by said cylinder and arranged to so advance the paper.

6. In a duplicating-machine, the combination with a printing-cylinder, and a stencil carried thereby, of devices furnishing a stopping-point to which paper is fed by hand, automatically-operating devices for moving the paper from the hand-fed position to a second stopping-point, and means for moving the paper from the second stopping-point to engagement with the cylinder.

7. In a machine of the class described, primary and secondary stopping-points to which paper is fed prior to the beginning of the printing operation, means by which the paper may be fed by hand to the primary stopping-point, and mechanically-operating means by which the paper is fed from the primary to the secondary stopping-point.

8. The combination with a printing-cylinder, and means for operating it, of a roller movable to and from said cylinder, and stops actuated by the movement of said roller and arranged to limit the hand-feeding of paper to the cylinder.

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