

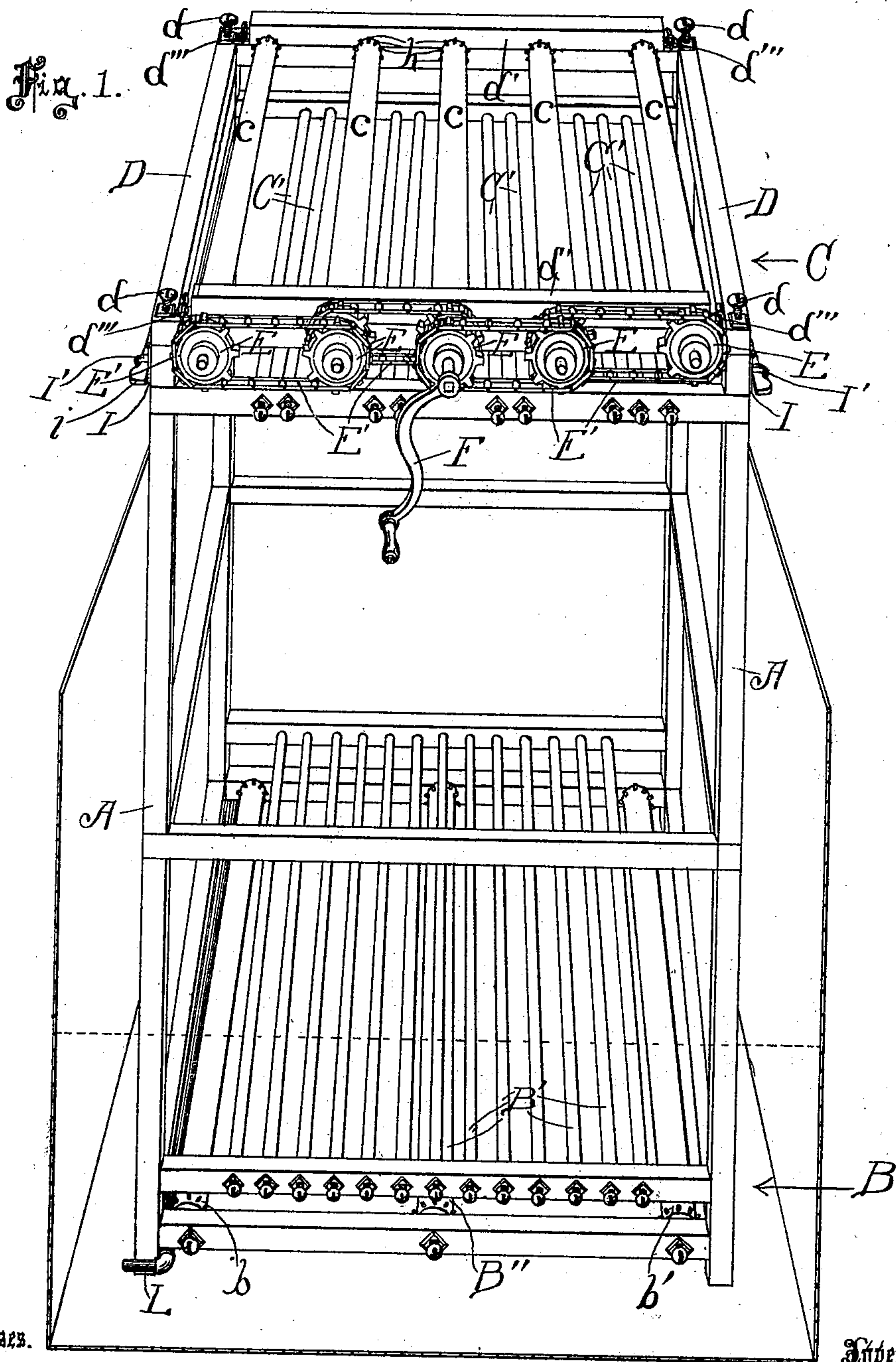
(No Model.)

3 Sheets—Sheet 1.

E. DESTÉ.  
APPARATUS FOR DYEING.

No. 512,949.

Patented Jan. 16, 1894.



Witnesses.

M. M. Lee.

F. M. Townsend.

Inventor

Elise Desté.

by Hazard & Townsend  
her Atlys.

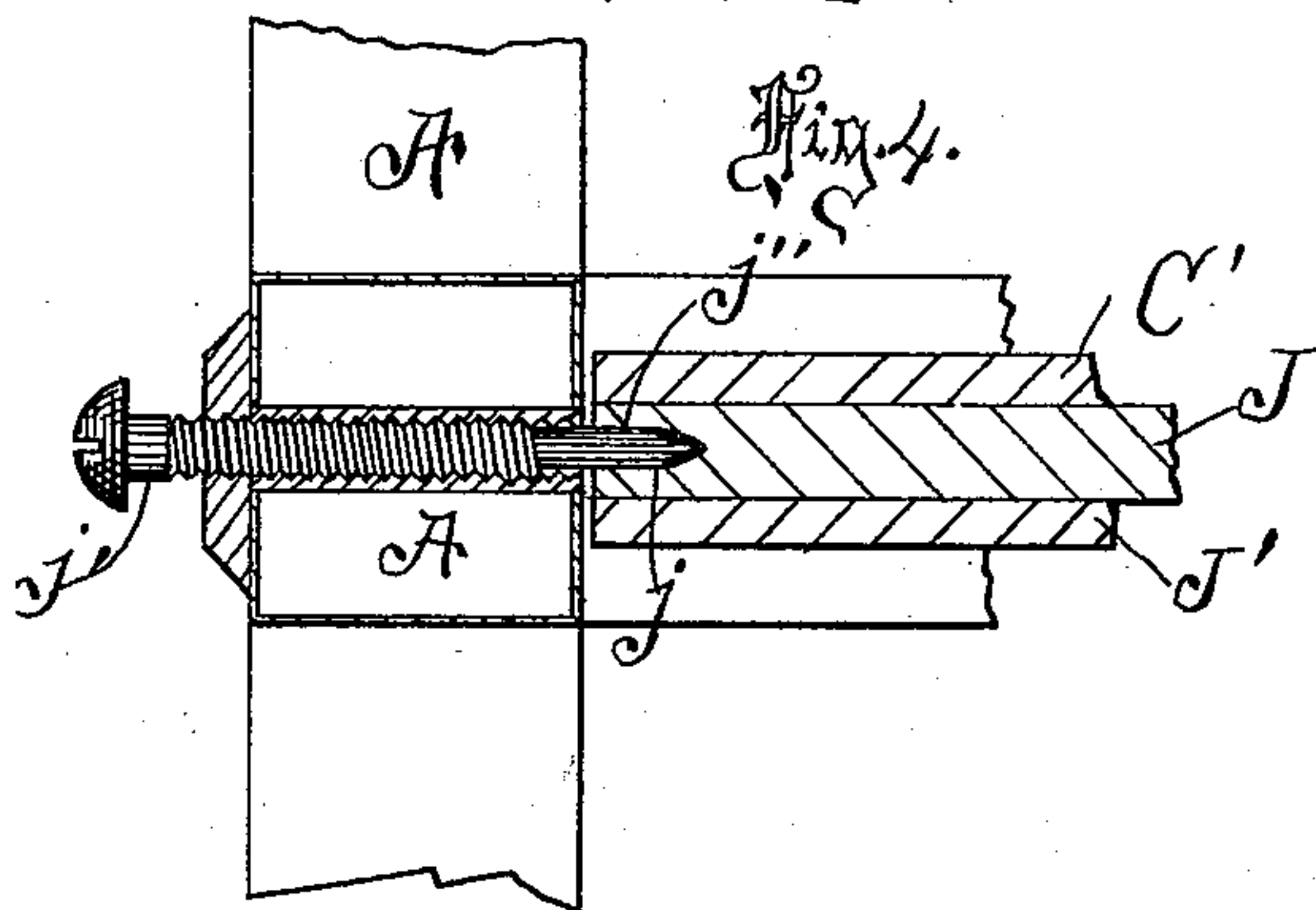
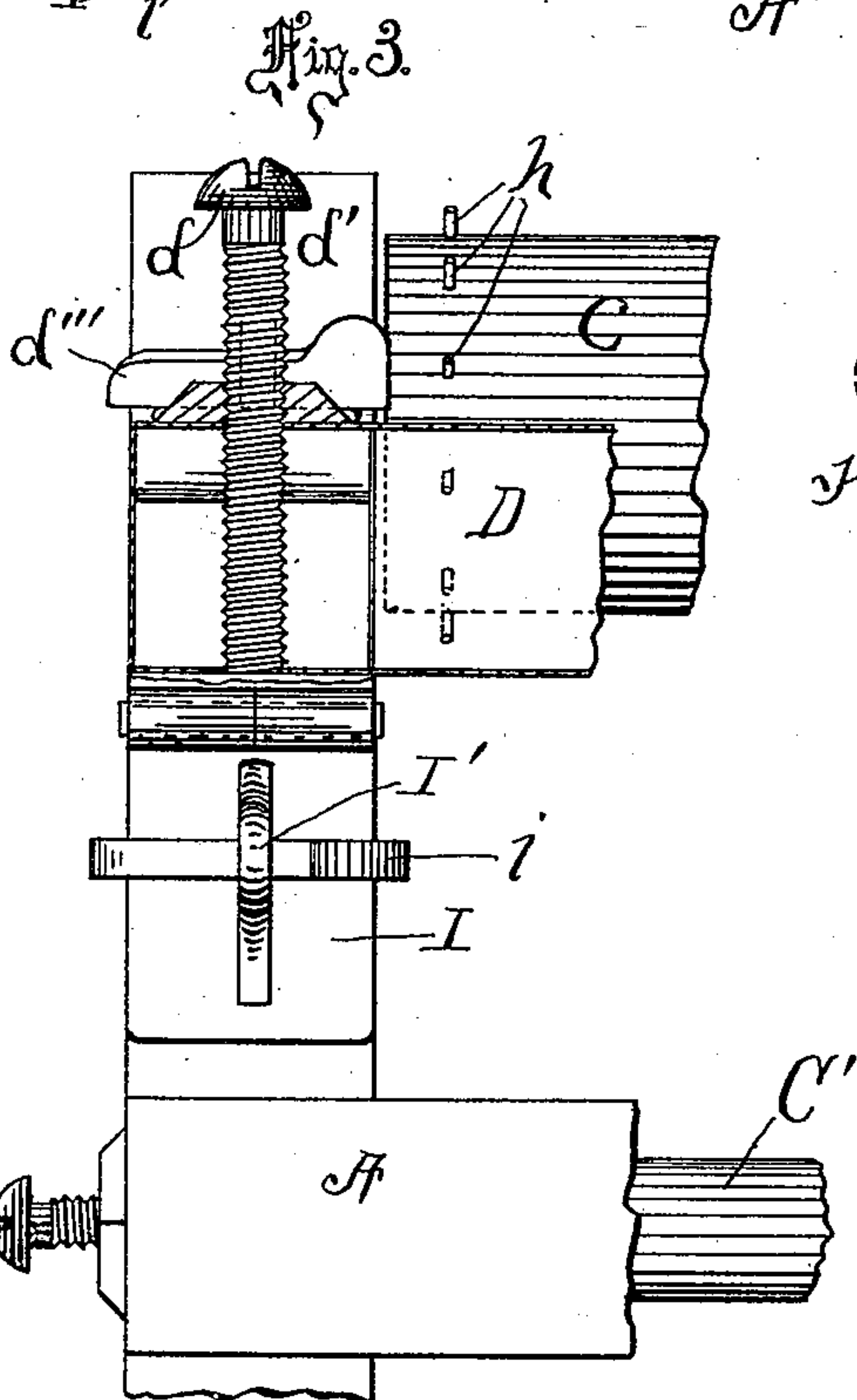
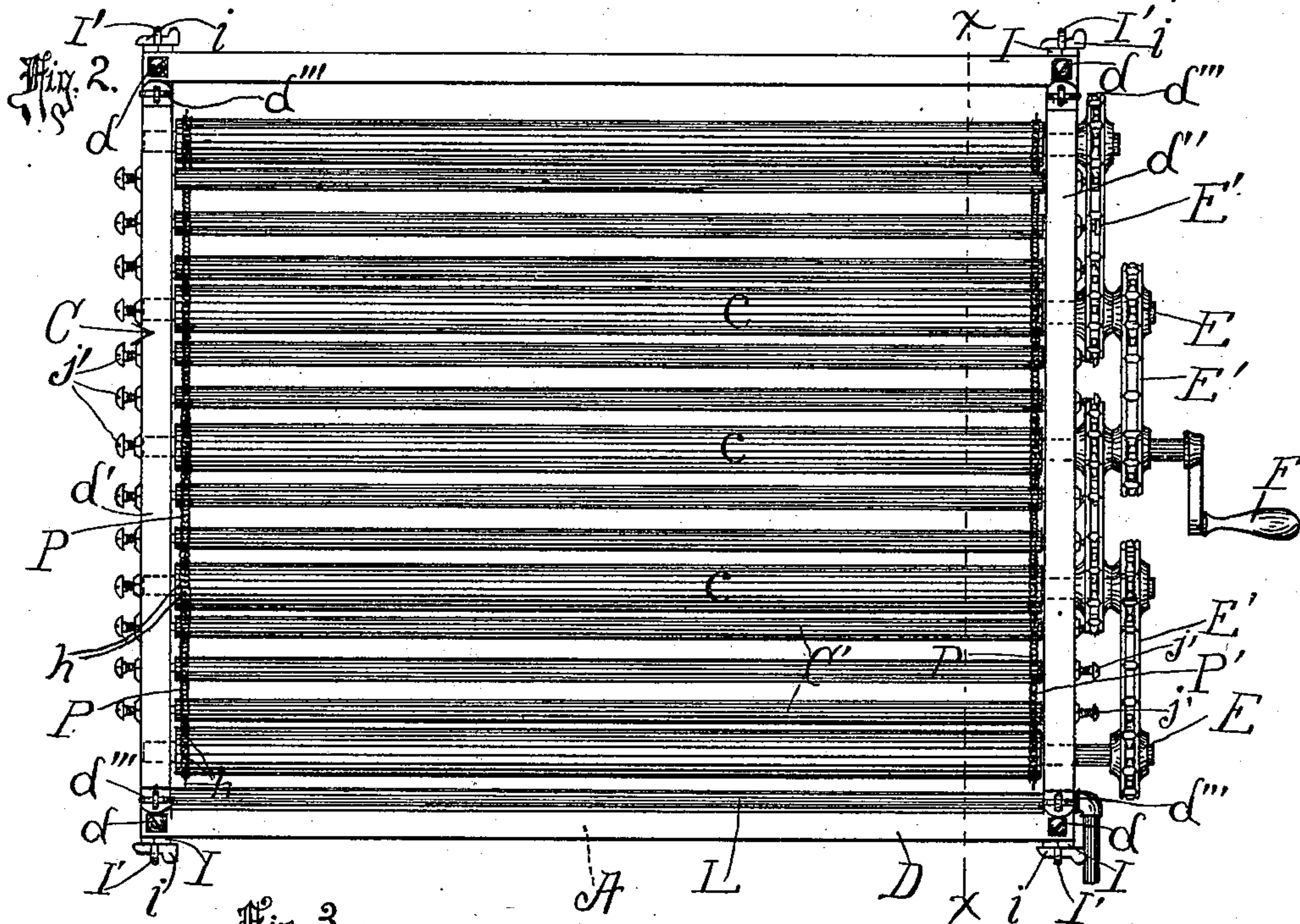
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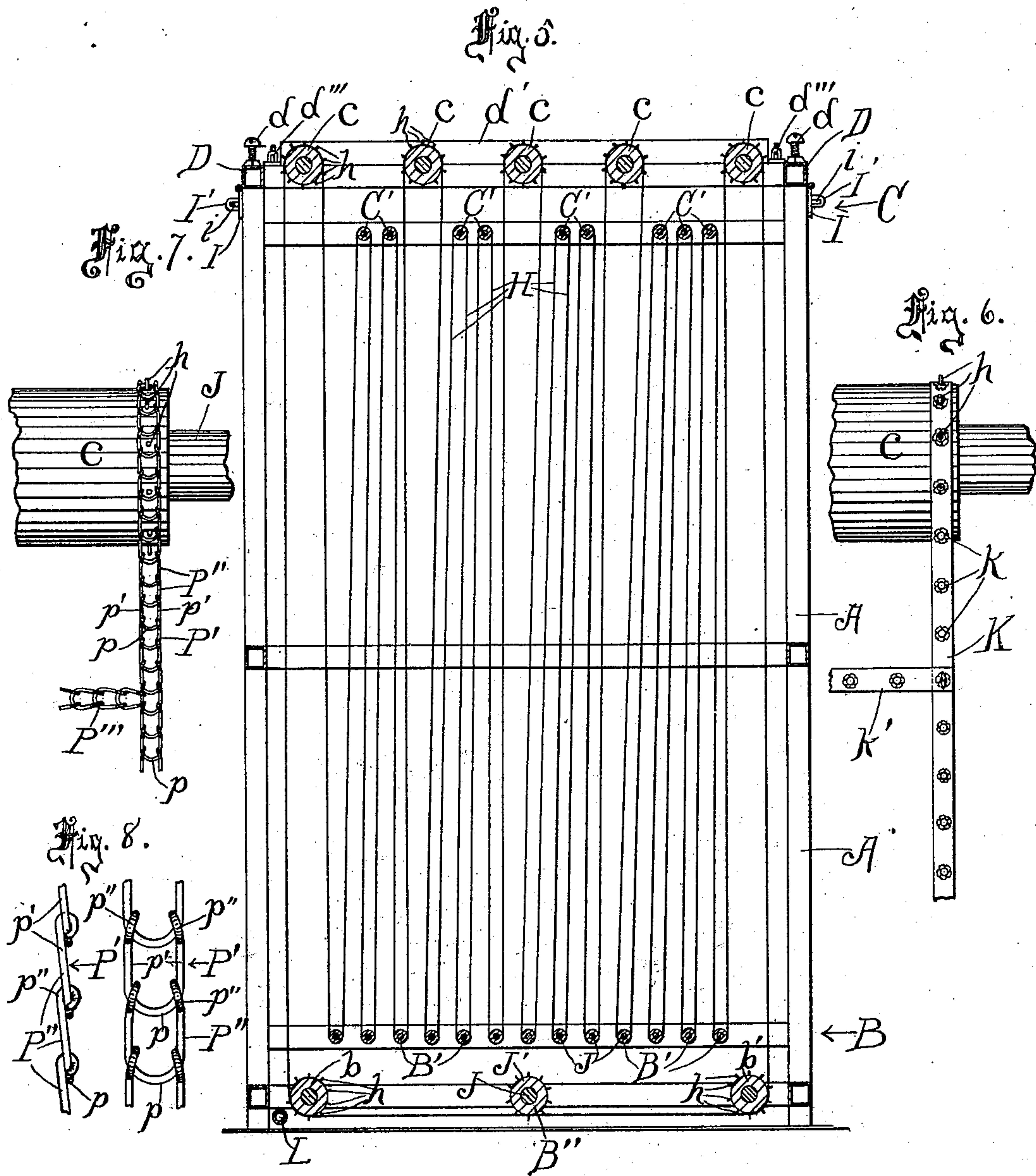
Liberton.  
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3 Sheets—Sheet 3.

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# Winter.

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Inventor.

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# UNITED STATES PATENT OFFICE.

ELISE DESTÉ, OF SAN FERNANDO, CALIFORNIA.

## APPARATUS FOR DYEING.

SPECIFICATION forming part of Letters Patent No. 512,949, dated January 16, 1894.

Application filed May 12, 1893. Serial No. 473,301. (No model.)

*To all whom it may concern:*

Be it known that I, ELISE DESTÉ, a subject of the King of Belgium, residing at San Fernando, in the county of Los Angeles and State of California, have invented a new and useful Dyeing-Machine, of which the following is a specification.

The object of my invention is to produce a simple, compact, cheap and effective machine, whereby silks, ribbons, and other fabrics may be quickly, conveniently, and evenly dyed with a minimum expenditure of labor.

A further object of my invention is to provide a machine which will not only dye silks easily and effectively, but which will also serve the purpose of the finishing rollers ordinarily employed in finishing silks after dyeing, and whereby the fabric is restored to nearly its original beauty and luster.

My invention consists in a dyeing machine comprising a frame provided with a lower series of parallel guide rollers journaled to such frame near the bottom of such frame; an upper series of guide rollers arranged parallel with such lower series of guide rollers, and journaled to such frame near the top of such frame; a suitable vertically adjustable drive roller carrying frame arranged near such upper series of guide rollers; a series of drive rollers journaled in such drive roller carrying frame and arranged parallel with the guide rollers; suitable means for vertically adjusting the drive roller carrying frame; two web returning rollers, arranged one upon each side of the lower series of guide rollers and with their peripheries projecting outside of the plane of the peripheries of such guide rollers, to return the web from one side of such series of guide rollers to the other side thereof; suitable means for vertically adjusting the drive roller carrying frame to tighten the web upon the frame, and suitable means for rotating the drive rollers.

My invention also comprises various other features and combinations of parts hereinafter fully set forth.

The accompanying drawings illustrate my invention.

Figure 1 is a perspective end elevation of a machine embodying my invention in place

in a vat for containing the dye stuff. The vat is shown in section to expose the machine, and the approximate height to which the dye will reach is indicated by a dotted line. Fig. 2 is a plan view of the machine removed from the vat. Fig. 3 is a fragmental sectional detail illustrating the means I employ for adjusting the drive roller carrying frame to tighten the web. Fig. 4 is a fragmental sectional detail illustrating the screw pinion whereby I am enabled to quickly remove and replace the guide rollers in the frame independent of each other. Fig. 5 is a sectional view on line  $x-x$  Fig. 2 looking toward the left. In this view the web is shown arranged upon the rollers ready to be dyed. Fig. 6 is a view of a fragment of one end of the drive rollers showing an eyeleted tape sprocket band in position thereupon and also showing a fragment of a cross sprocket band attached thereto. Fig. 7 is a similar view showing my improved elastic sprocket chain in position upon the roller. Fig. 8 is an enlarged fragmental view of a fragment of my improved elastic sprocket chain.

My invention is especially designed for use in what is known to the trade as "dry dyeing," that is to say, for dyeing fabrics in dye held in solution in benzine, but it is also adapted for use in "wet dyeing," or where the dye is held in solution in water.

A represents the frame of the machine which is formed of any suitable material which will not be acted upon by the chemicals in the dye.

B represents the lower series of rollers which comprise the guide rollers  $B'$  which are journaled near the bottom of the frame and the web returning rollers  $b b'$  which are journaled respectively one at each end of the lower series of rollers and have their peripheries respectively projecting outside of the peripheries of the guide rollers  $B'$ .

C indicates the upper series of rollers which consist of the guide rollers  $C'$  which are journaled near the top of the frame and are arranged respectively parallel with each other and with the lower series of rollers B, and the drive rollers  $c$  which are arranged above the guide rollers  $C'$  and are journaled in a vertically movable frame D.



As shown in the drawings, the upper series of rollers C are fourteen in number, and the lower series B are sixteen in number, and the drive rollers *c* are arranged at suitable intervals to give the required friction upon the fabric to carry it around upon the rollers. As shown in the drawings, the upper series of rollers C, consists of five drive rollers *c* and nine guide rollers C'.

My reason for arranging the drive rollers and the frame D at the top of the machine is simply for convenience in construction and use; it is to be understood that the frame D and the rollers *c* may be arranged below the rollers C' without departing from the spirit of my invention. The drive roller carrying frame D is rectangular and is provided at each corner with a set screw *d* respectively arranged to engage with the top of the frame A to force the drive roller carrying frame D upward when the set screws are screwed downward against the frame A. The frame D is provided at each end with removable journal locking bars *d'* *d''* Fig. 2 which are secured to the frame by suitable means such as the staple and pin *d'''* and may be removed to allow the guide rollers *c* to be removed from the machine.

In practice the rollers will be made of glass or other suitable material which will not be acted upon by chemicals in the dye and the surface of the drive rollers will be roughened to give a certain adhesion or friction between the drive rollers and the fabric.

My improved means whereby I am enabled to provide glass or porcelain covered rollers of suitable length without liability of their breaking, and also provide means for quickly placing them in or taking them from the machine consists of a roller comprising a central stiffening rod J provided with an exterior coating of glass, porcelain or other suitable material, J', the stiffening rod being also provided at each end with a suitable centrally arranged journal receiving opening *j* to receive the journal pin *j'*; such journal pin consisting of a screw threaded member one arranged upon each side of the frame of the machine and each provided upon one end with a smooth journal bearing *j''* adapted and arranged to be inserted in the journal opening *j* in the rod J and adapted to screw through the frame of the machine to be thereby inserted into or withdrawn from such journal opening.

The drive roller carrying frame D is secured upon the frame of the machine A by means of slotted hasps I which are secured one to each corner of the roller carrying frame, and arranged to project downward along the side of the frame of the machine; the staples I' secured to the frame of the machine and adapted to pass through the slot in the staple, and the pin *i* arranged in the staple to retain the hasp upon the staple. By these means the frame D may be vertically adjusted and the staple and the pin will act as

a guide to hold the drive roller carrying frame in the proper position relative to the frame of the machine.

The rollers *c* are connected together by means of sprocket wheels E mounted upon one end of each of such rollers and the sprocket chains E' arranged trained around the sprocket wheels. Suitable means are provided for applying power to cause the rollers to revolve. As shown in the drawings, these means consist of a crank F; means for applying steam, electric or other power to the machine may be substituted therefor.

As shown in the drawings, the total length of fabric required to make a continuous web passing around each of the rollers, as shown in Fig. 5 is approximately thirty yards, which is the usual length of a piece of silk. By increasing the distance between the series of rollers C and B or by increasing the number of rollers in each series the total length of fabric which will be required to form a continuous web may be increased to any length desired.

If it is required to dye a shorter piece of silk, say fifteen yards, one half of the rollers may be used and the web may be returned upon the centrally arranged return roller B'' the remaining half of the rollers of each series not being used.

In practice, the web may be placed upon the machine from either end, or from the center, but for convenience of description I will describe the operation of placing the web upon the machine starting at the upper left hand corner of Fig. 5. The bolt of silk or other fabric to be dyed is supported upon a suitable revolving reel, (not shown,) and the end of the fabric is placed over the first drive roller of the series of drive rollers and carried downward to the lower series of guide rollers B', passed around the first roller of such lower series of rollers and thence upward and over the first roller in the series of guide rollers C', thence downward and around the second lower guide roller, thence upward around the second upper guide roller, thence down and around the third lower guide roller, thence upward and over the second drive roller, and thence down and around the fourth lower guide roller, and so on until the last roller in the lower series of guide rollers is reached, thence passing upward and over the last roller of the series of drive rollers, thence downward and around the web returning roller *b'*, thence across beneath the lower guide rollers B' to the other web returning rollers *b* and thence back to the point of beginning where the two ends of the web are secured together. In case the silk is a little over thirty yards in length the drive roller carrying frame D is vertically adjusted by screwing the set screws *d* downward against the frame A to thereby raise the vertically adjustable frame to take up the extra length of web so that the ends will not overlap to interfere with the perfect dyeing of the entire



piece. When the two ends are secured together by sewing in the usual manner or otherwise, the frame D is adjusted to tighten the web upon the rollers to give sufficient friction between the web and the rollers to cause the web to be carried around through the machine when the drive rollers *c* are rotated by means of the crank F.

My improved machine is adapted for dyeing remnants of silk or ribbon in an expeditious and effective manner. For this purpose I provide the drive rollers *c* and the web returning rollers *b b'* with a series of sprockets *h* around which I train suitable sprocket chains or belts P, P' (shown in Fig. 2) which pass around the guide rollers B' and C' in the same manner the web or silk H is passed therearound, and the remnants of ribbon or silk will be attached to the chain independent of each other, by suitable clips or other devices and will be carried around with the chain by the revolution of the rollers.

It is desirable that the sprocket chains remain permanently upon the machine; by securing one end of a bolt of silk to the sprocket chains, by simply revolving the rollers the silk will be carried around with the chain and expeditiously placed in position upon the machine. In order to use my machine for finishing silk or for taking up the slack of the fabric it is also necessary for a certain degree of elasticity to be allowed in the chain.

In order to be enabled to leave the chain upon the machine at all times and still allow sufficient latitude of adjustment to properly tighten the fabric upon the rollers, I provide an improved elastic sprocket chain P (P') which chain comprises a series of spring metal links P'' each link having one end formed into a loop *p* having a rounded end, and having its side members *p'* each provided with an eye *p''* arranged encircling the loop of its adjoining link, such members being arranged to spring apart to cause the eyes to slide outward upon the rounded end of the loop to normally tend to shorten the chain. When tension is placed upon the chain the eyes *p''* slide down toward the center of the loop *p* and thus allows the chain to lengthen: as soon as the tension is removed the members spring apart and the eyes slide upon the rounded end and shorten the chain.

When it is desired to dye remnants of ribbon, cross sprocket chains P''' are secured to the sprocket chains P P' extending across the machine parallel with the rollers, and the remnants of ribbon are secured to the cross sprocket chains and arranged parallel with the side sprocket chains. By this arrangement the remnants of ribbon may be attached to the chain indiscriminately and irrespective of color and those pieces which are dyed in five minutes or so, can be removed from the chain as soon as they are dyed, and the remainder of the remnants may be again subjected to the action of the dye and the various pieces removed when-

ever they become sufficiently colored, thus saving much labor and inconvenience which has heretofore been experienced in dyeing remnants of ribbons and silks.

In Fig. 6 I have shown a band of tape K which is provided along its length with a series of eyelets *k* which are arranged to receive the sprockets *h* but I consider the elastic sprocket chain shown in Figs. 7 and 8 to be preferable. *k'* is a cross band adapted to serve the same purpose as the cross chain P'''.

It is immaterial how many rollers are used in constructing a dyeing machine according to my invention, so that the independent series of rollers are uneven in number, that is to say, when one series of rollers exceeds in aggregate number the other series of rollers by one roller, and that the two outer rollers of the series having the greater number are arranged with their peripheries extending outside of the plane of the peripheries of the remainder of the rollers of such series.

The essential feature of my invention consists in the means whereby I obtain a continuous web of great length and compactness to thereby continuously immerse and remove the fabric from the dye liquid.

L is a perforated steam pipe which is arranged at the bottom of the machine. In dyeing silks with benzine, after the silks are dyed and it is desired to finish the silk upon the machine, the machine is removed from the vat containing dye and is placed in a closed box: a suitable flexible tube (not shown) is attached to the pipe L, the other end of such tube being attached to the steam pipe, and steam is turned through the pipe and is blown through the perforations in the pipe across beneath the guide rollers, and rises up, filling the box with steam which dampens the fabric to the required degree, after which the frame D is vertically adjusted to tighten the silk upon the rollers and the rollers are rotated to carry the silk therearound to thereby give it the finish.

Now, having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The dyeing machine set forth comprising the frame provided with a lower series of parallel guide-rollers journaled to such frame near the bottom of the frame; an upper series of guide-rollers arranged parallel with such lower series of guide-rollers and journaled to such frame near the top of such frame; a suitable vertically adjustable drive-roller-carrying frame arranged near such upper series of guide-rollers; a series of drive-rollers journaled in such drive-roller-carrying frame and arranged parallel with the guide-rollers; two web-returning rollers arranged, one upon each side of the frame to return the web from one side of such frame to the other side thereof; suitable means for adjusting the drive-roller-carrying frame to tighten the web upon such frame, and suitable means for rotating the drive-rollers.



2. The dyeing machine set forth comprising a frame provided with the lower series of parallel guide rollers journaled to such frame near the bottom of such frame; an upper series of guide rollers arranged parallel with such lower series of guide rollers and journaled to such frame near the top of such frame; a suitable vertically adjustable drive roller carrying frame arranged near such upper series of guide rollers; a series of drive rollers journaled in such drive roller carrying frame and arranged parallel with the guide rollers; suitable means for vertically adjusting the drive roller carrying frame; two web returning rollers arranged one upon each side of the lower series of guide rollers and with their peripheries respectively projecting outside of the peripheries of such guide rollers to return the web from one side of such series of guide rollers to the other side thereof; suitable means for vertically adjusting the drive roller carrying frame to tighten the web upon such frame, and suitable means for rotating the drive rollers.

3. The combination of the frame of the ma-

chine; the lower series of guide rollers journaled near the bottom of such frame; the upper series of guide rollers journaled near the top of such frame; the rectangular drive roller carrying frame arranged on the top of such frame of the machine; the drive rollers journaled in such drive roller carrying frame and arranged parallel with the guide rollers; the set screws arranged near each corner of the drive roller carrying frame and adapted to screw therethrough to engage with the frame of the machine to vertically adjust such drive roller carrying frame; the slotted hasps, one secured to each corner of the drive roller carrying frame and arranged to project downward along the side of the frame of the machine; the staples each secured to the frame of the machine and arranged to project through the slot in one of the hasps and the pins one passed through each of the staples to secure the hasps upon the staples.

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Witnesses:

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