

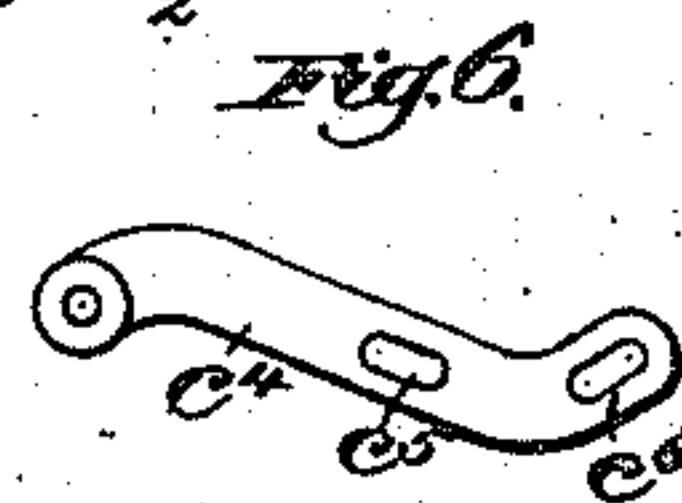
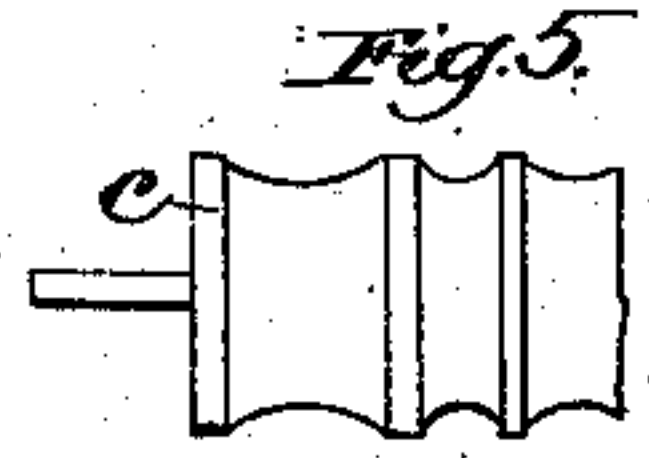
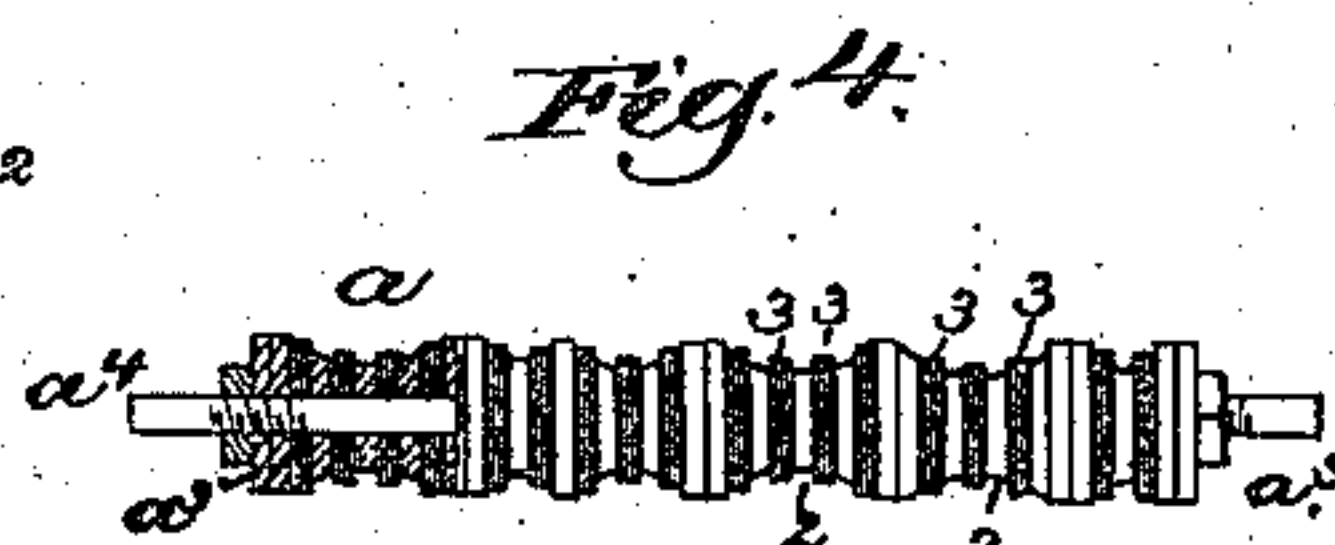
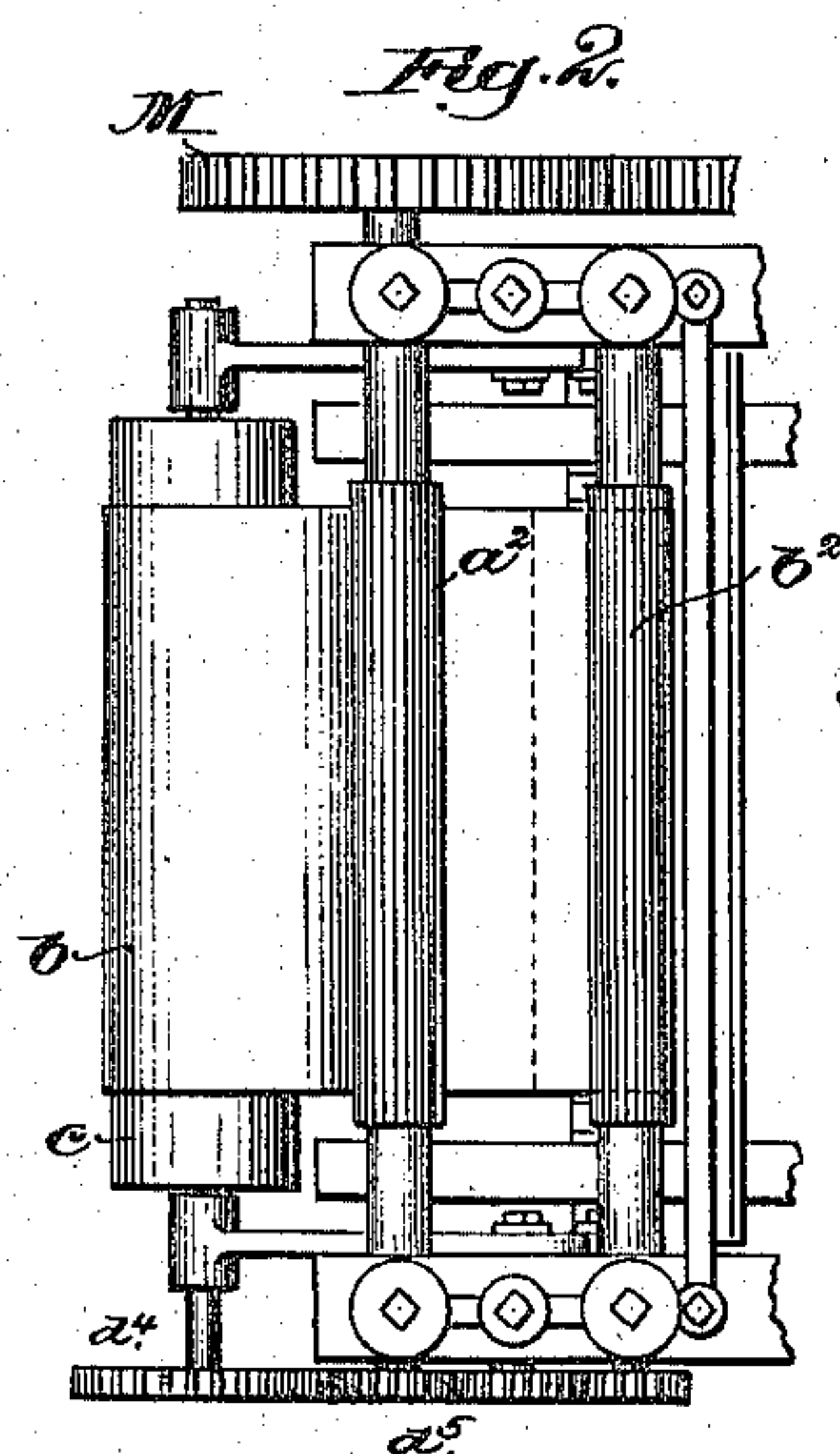
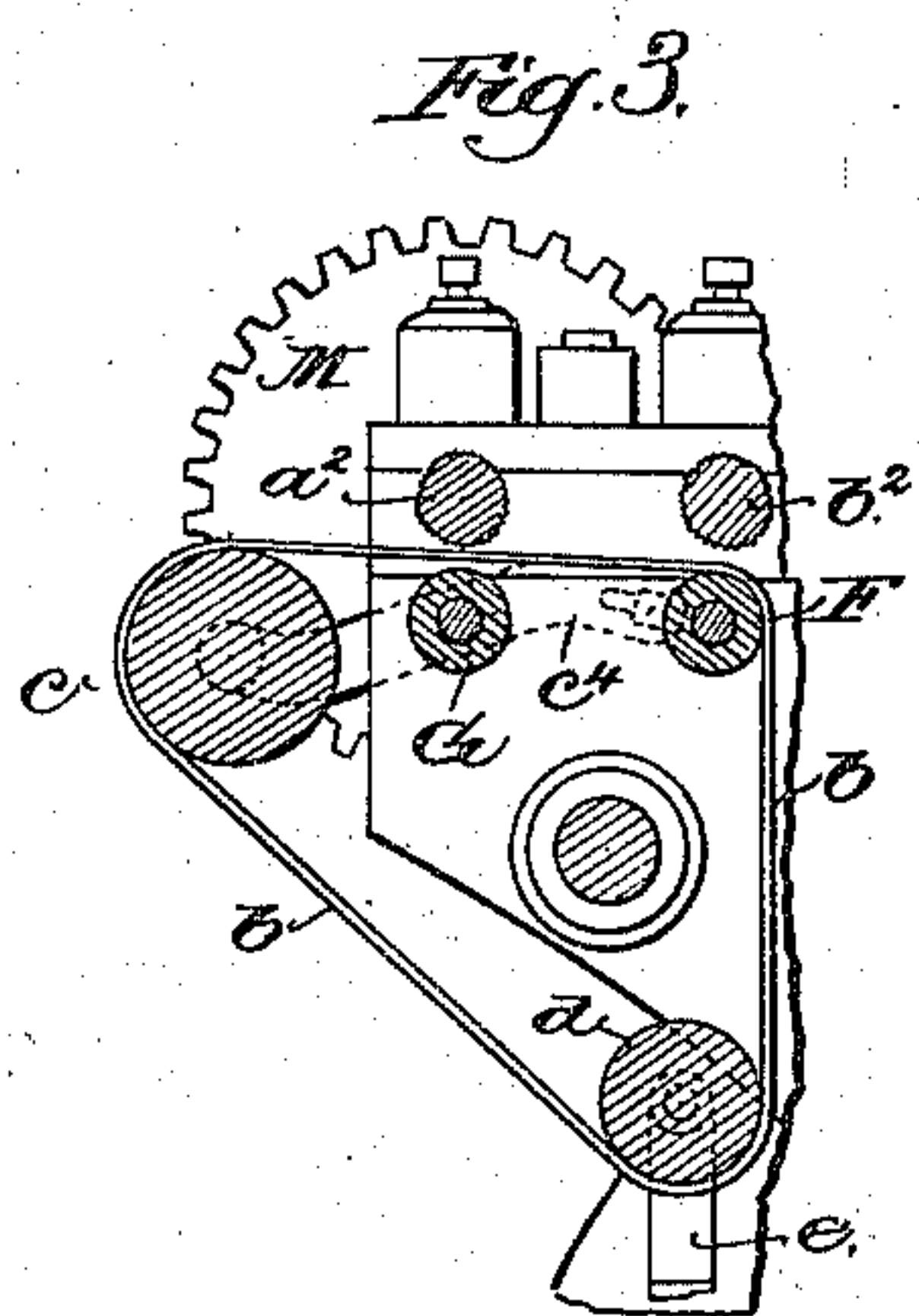
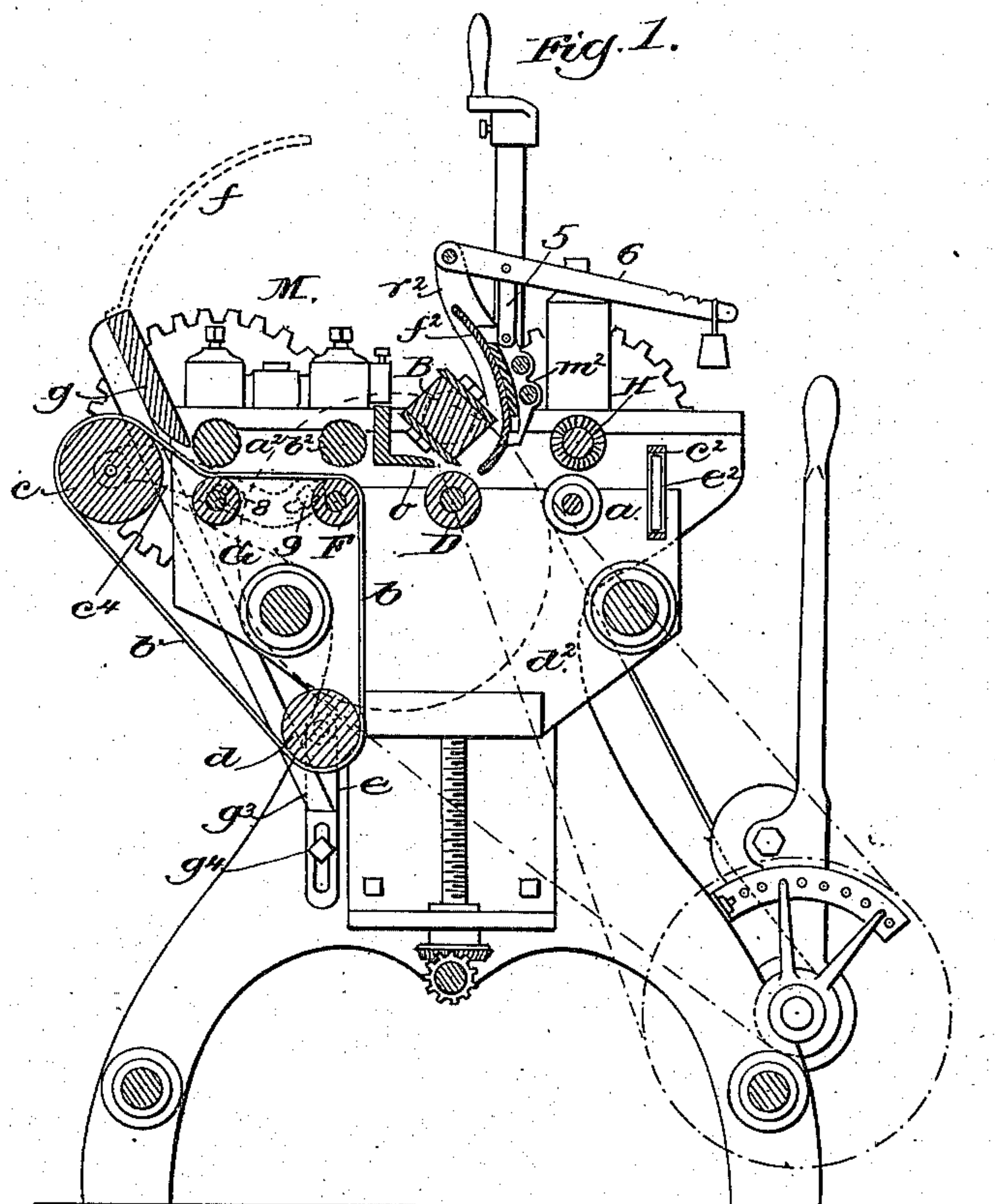
(No Model.)

H. F. CAMPBELL.

HOOP PREPARING MECHANISM.

No. 288,205.

Patented Nov. 13, 1883.



Witnesses.  
John F. C. V. Printz  
Fred. A. Powell.

Inventor.  
Henry F. Campbell  
by Crosby & Gregory Attys.



# UNITED STATES PATENT OFFICE.

HENRY F. CAMPBELL, OF CONCORD, NEW HAMPSHIRE.

## HOOP-PREPARING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 288,205, dated November 13, 1883.

Application filed March 19, 1883. (No model.)

*To all whom it may concern:*

Be it known that I, HENRY F. CAMPBELL, of Concord, county of Merrimac, State of New Hampshire, have invented an Improvement in Hoop-Preparing Mechanism, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

10 This invention is an improvement on United States Patent No. 272,029, heretofore granted to me, and has for its object to plane and to crimp and bevel or curve the hoop into true circular shape to be applied to a barrel, or to  
15 be put into proper packages for shipment.

In the use of hand-made hoops having one round side and bark thereon it is customary to place the same in water for a sufficient length of time to properly soak and make them sufficiently flexible to be readily bent by hand  
20 about and so as to conform to the barrel.

The crimping and bending portion of the machine herein described so crimps the hoop that the bending portion is enabled to readily  
25 bend the same into proper shape to fit a barrel, and this without preliminary soaking.

Bending the hoops automatically insures a more even distribution of the bend and the production of a more truly circular hoop at a  
30 great saving of time and expense, and the operation of applying and setting half-round bark-sided hoops is rendered as rapid and easy as that of setting flat hoops. The hoops being bent uniformly in a substantially true  
35 circle enables the employment of metal fastenings, thus obviating the expensive and slow step of making locking-notches such as commonly required in hand-made hoops of the class referred to. In bending half-round  
40 bark-covered hoops it is very necessary that the bark should not be marred or removed, and also that the hoop should not be split longitudinally by reason of pressure upon its substance of varying thickness from center to  
45 edge.

To obviate these difficulties I have devised mechanism for crimping and bending which includes a strong endless yielding or elastic belt or bed. In my experiment I have tried  
50 heavy canvas, leather, and india-rubber, and in practice I prefer an india-rubber belt of

about four-ply. This belt serves as a support for the rounded bark-covered side of the hoops, and permits the same, with its knots, warts, and projections, to be embedded into the belt  
55 or bed by the pressure of one or more rollers operating against the dressed or planed side of the hoop. In the present instance I have shown two such rollers, one of which I call the "crimping" or "fulcrum" roller, as it acts  
60 to crimp the hoop, and also serves as a fulcrum over which the hoop is bent. These rollers are both shown as fluted in the direction of their length, and their projecting ribs are so shaped as to crimp or indent the wood  
65 transversely at the dressed side of the hoop at intervals of substantially one-fourth of an inch, thus compelling a uniform circular curving or bending of the hoop, the rounded and irregular bark side of the hoop opposite the  
70 crimping-rollers being supported entirely to its edges, no matter what may be its curvature, thus obviating longitudinal splitting. By padding the rollers over which the belt referred to runs either with india-rubber or other elastic or yielding covering, the danger of splitting is further reduced. In some instances, when bending wide free rift hoops, the rollers referred to, and over which the said belt is extended, may be provided with annular con-  
75 caved or approximately V-shaped grooves. I have provided the bending mechanism with a discharging device which acts to throw the bent hoop out of the machine, and with an adjustable hoop-lifting roller adapted to elevate  
80 the said belt beyond the point where the hoop is crimped, thus enabling the hoop to be simultaneously crimped and bent in the arc of a circle of greater or less diameter.

My invention consists, essentially, in a hoop  
90 crimping and bending mechanism comprehending a yielding endless traveling belt or bed and a fluted crimping-roller, to operate as will be described; also, in the combination, with a yielding or elastic traveling belt  
95 or bed and a fluted crimping-roller, of a lifting-roller, whereby the crimped hoop may be bent into the arc of a circle of greater or less diameter; also, in the combination, with a yielding or elastic traveling belt, crimping  
100 mechanism, and hoop-lifting roller, of a discharging device, to operate as will be described;



also, in the combination, with a mechanism to dress or plane a hoop, of mechanism to simultaneously crimp and bend the said hoop, as will be described.

5 Figure 1 in vertical section represents a mechanism embodying my invention. Fig. 2 is a plan view of all that portion of the said mechanism at the left of the cutter-head, except the discharging device, which is removed. Fig.  
10 3 is a sectional detail of the left-hand portion of Fig. 1, showing the hoop-lifting device or roller in another position. Fig. 4 is a detail of one of the under feed-rollers. Fig. 5 is a detail of a part of the hoop-lifting roller,  
15 showing its annular grooves, which are omitted from the drawing Fig. 1; and Fig. 6, a detail of one of the arms carrying the shaft of the hoop-lifting roller.

The parts lettered B, D, H,  $a^2$ ,  $b^2$ , G, F,  $c^2$ ,  
20  $e^2$ ,  $d^2$ ,  $f^2$ , o,  $m^2$ ,  $r^2$ , and 5 6 are substantially the same as in my patent referred to, so need not be herein further described.

The under feeding-roller,  $a$ , (shown in Fig. 1 and detached in Fig. 4,) is composed of a series of leather disks alternated with more  
25 flexible or elastic disks of greater diameter, preferably india-rubber disks, the latter appearing at such portions of the roller as come directly into contact with the bark when feeding  
30 ing the hoop or hoop material through the machine, the more elastic disks first coming in contact with the back of the said hoop and yielding to it. The roller  $a$  is provided with a series of annular depressions, as is the roller  
35  $A'$  shown in the said patent, and also in my earlier patent of the United States, No. 248,021. The leather disks are marked 2, and those of rubber (shown in black—see Fig. 4) are marked 3, and all are held by nuts  $a^3$  on a  
40 shaft,  $a^4$ .

I desire it to be understood that the rollers marked F G may be removed and a roller such as  $a$  be used instead.

The yielding flexible or elastic endless belt  
45  $b$  is extended about the rollers F G, and also about the hoop-lifting roller  $c$  and the roller  $d$ , herein shown as adapted to act as a take-up roller. This belt, preferably of india-rubber, about four-ply, receives against it the  
50 rounded bark side of the hoop after passing under the presser o, and the knots, warts, and protuberances of the bark side of the said hoop are embedded more or less into the said belt, the rollers F G below also yielding more or  
55 less.

The rollers  $a^2$   $b^2$  are fluted longitudinally, and their ribs or projections are so shaped that they indent the dressed or planed side of the hoop transversely at intervals of about one-  
60 fourth of an inch, thus establishing bending-points for the hoop, so that as it is subsequently lifted by the lifting-roller  $c$ , over which, as shown, and as I prefer, the belt  $b$  is extended, the said hoop is bent or curved uniformly in a true circle of greater or less radius,  
65 according to the position of the hoop-lifting

roller with relation to the roller  $a^2$ , the latter serving as a rolling fulcrum about which the hoop is bent.

The roller  $c$  may or may not be covered with a yielding substance, and preferably will be grooved annularly, as in Fig. 5, to obviate splitting, especially thin hoops having free  
70 rift, or of wood easily split longitudinally, as the grooved surface constitutes a better support for such a hoop out to its edges, from its thicker center.

The roller  $c$  has its axis mounted in arms  $c^4$ , slotted at  $c^5$  and  $c^6$ , (shown best in Fig. 6,) to receive the adjusting-bolts 8 9, the said  
80 slots being so shaped and the said bolts being so located that the arms, when moved to elevate or depress the lifting-roller  $c$ , as shown, respectively, in Figs. 1 and 3, will always be moved in the arc of a true circle, thus enabling  
85 the gear  $d^4$  on the axis of the roller  $c$  to continue in engagement with and be driven positively by the gear  $d^5$ , which latter is attached to the shaft of the crimping-roller  $a^2$ , driven as in my former patents. The higher the  
90 roller  $c$  above the under surface of the crimping-roller the sharper the curve, and the less the diameter of the hoop being bent. The belt  $b$  being driven positively by the roller  $c$  enables the same to act as a very powerful  
95 feeding auxiliary to the usual feeding device, especially when a larger knot or a bad crook in a hoop is being drawn between the pressers and the cutter-head on one side and the bed-roll on the other side.

The slack of the belt is taken up and the belt kept taut by the roller  $d$ , mounted, as herein shown, in boxes at the upper end of adjustable arms  $e$ . When straight hoops are  
100 to be delivered, the roller  $c$  will occupy the position Fig. 3. The hoop being bent or curved upward about the crimping-roller  $a^2$  as a fulcrum by the roller  $c$ , and also by the belt extended over the roller  $c$ , the hoop is made to pass under the hoop-discharging device  $g$ ,  
105 herein shown as a bar more or less inclined from a vertical position, according to the diameter of the hoop, and curved or beveled at its lower end, as shown in Fig. 1, the said device  $g$  being held by adjustable arms  $g^2$ , one of which is shown in Fig. 1, the said arms  $g^2$  being held in the desired adjusted position by bolts or screws  $g^4$ . Each arm  $g^2$  and  $e$  may be held in any usual or suitable manner.

The crimped and curved hoop passes out  
120 between the roller  $c$  or belt and the lower end of the discharging device  $g$ , and is by the same prevented from coming back over and dropping upon the moving parts of the machine. In some instances I apply a shield,  $f$ ,  
125 as represented in dotted line, Fig. 1, to further defend the moving parts of the machine from being struck by a hoop as it passes out from the machine.

With flat hoops shown on both sides, the  
130 yielding belt would not be necessary; but a hoop with one rounded side, and that covered



with bark, could not be crimped and bent without injurious splits, or such marring of the bark as will render the hoop unmerchantable.

5 I desire it to be understood that the mechanism at the left of the machine, (shown in Fig. 1,) it commencing with the roller  $b^2$  and the belt, may be used separately from the hoop-dressing apparatus at the right of the roller  $b^2$ ; or, in other words, the devices shown in  
10 Figs. 2 and 3 may be used by themselves and form a hoop crimping and bending mechanism or machine, the gear M on shaft of roller  $a^2$  being properly driven.

15 It is possible to fairly curve and fashion into hoops hoop-stock nearly seasoned and very free from knots or warts by means of a smooth surface roller, instead of the fluted crimping-roller  $a^2$ .

20 The roller  $a$ , Fig. 4, made as described, is composed of disks of different density.

I claim—

1. In mechanism for bending hoop-stock rounded on one side and having bark thereon,  
25 the crimping-roller to act upon the planed side of the said hoop-stock, and an endless traveling yielding belt, to operate substantially as described.

2. The yielding belt or bed and crimping  
30 or fulcrum roller, combined with a hoop-lifting

roller to effect the bending of the hoop over the said crimping or fulcrum roller, substantially as described.

3. The yielding belt or bed, crimping or fulcrum roller above it, and the hoop-lifting  
35 roller, combined with a hoop-discharging device, substantially as shown and described.

4. The endless traveling belt, and rollers G F  $d$ , to support it, combined with the positively-rotated hoop-lifting roller made adjustable, substantially as and for the purpose described.  
40

5. The endless belt, its supporting-rollers G F  $d$ , and positively-rotated roller  $c$  and rollers  $a^2 b^2$ , combined with the presser  $o$ , and  
45 rotating cutter B, and bed-roll D, to operate substantially as described.

6. In a machine for preparing hoops, a feed-roller having its surface composed of disks of material of different density, the more flexible disks first coming in contact with the bark  
50 on the hoop, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HENRY F. CAMPBELL.

Witnesses:

GEO. W. GREGORY,  
B. J. NOYES.