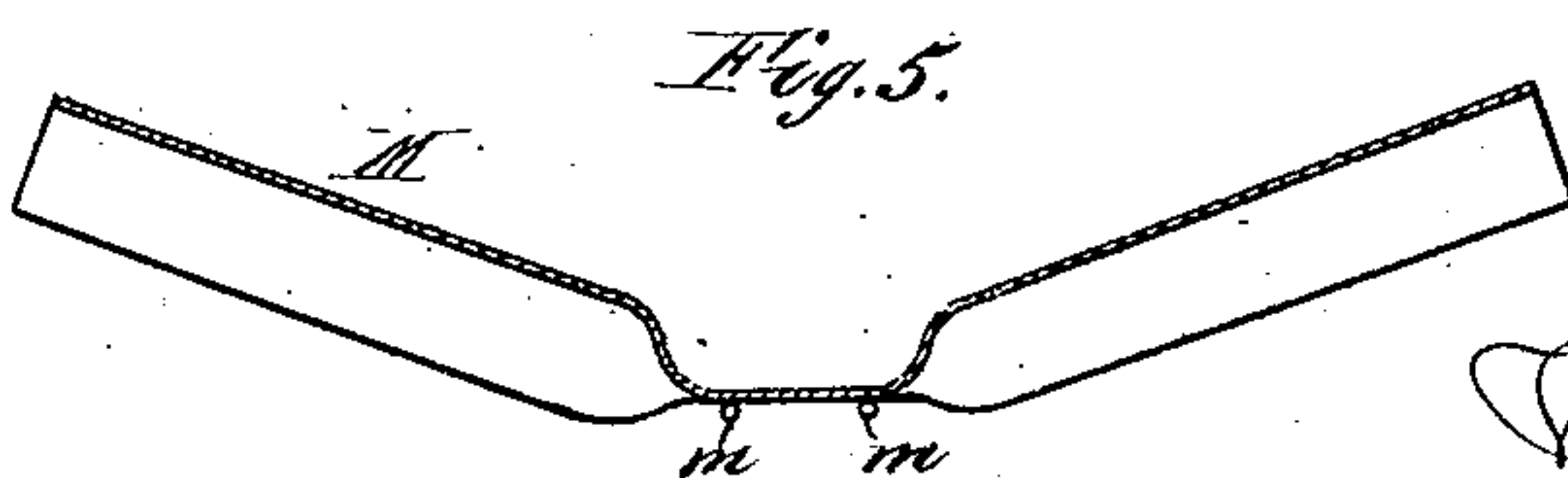
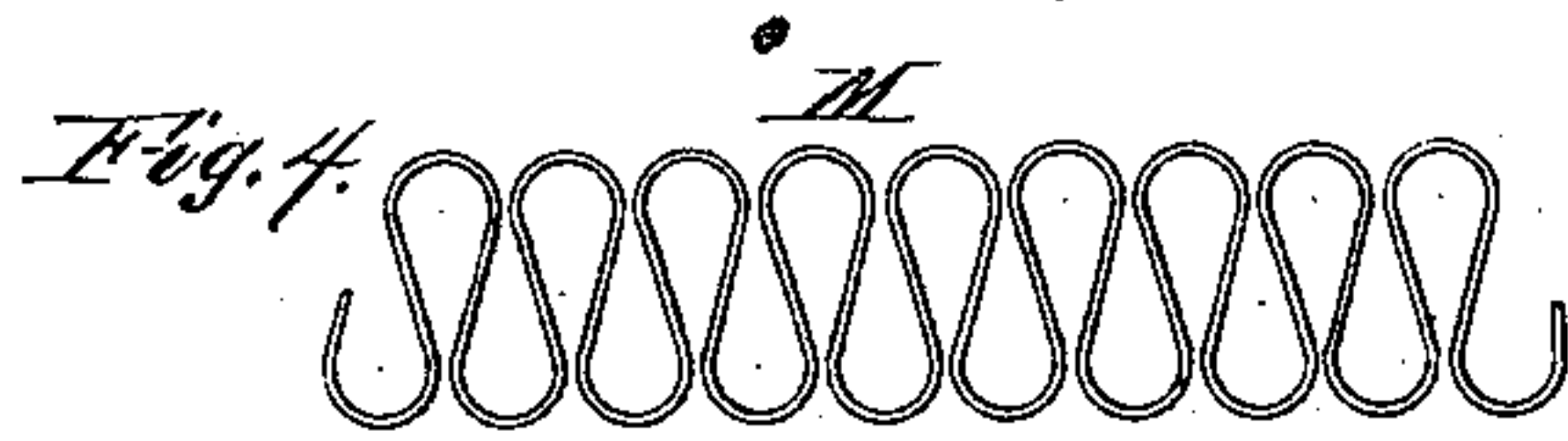
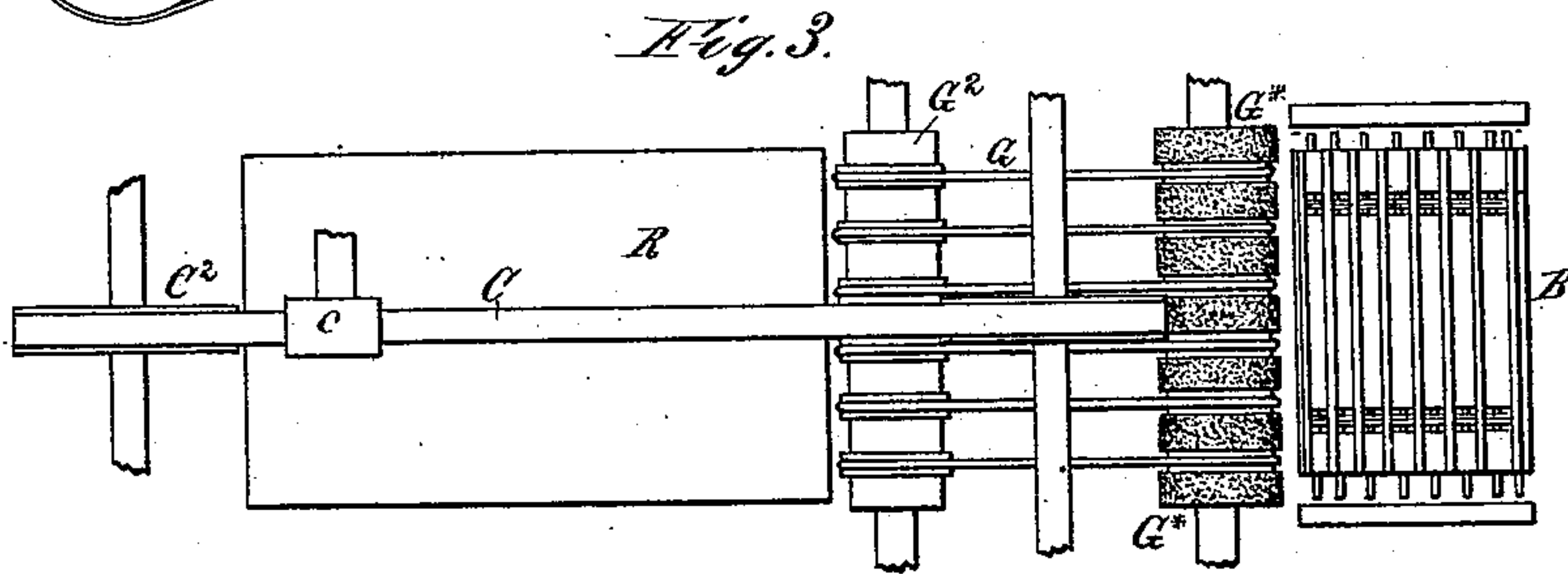
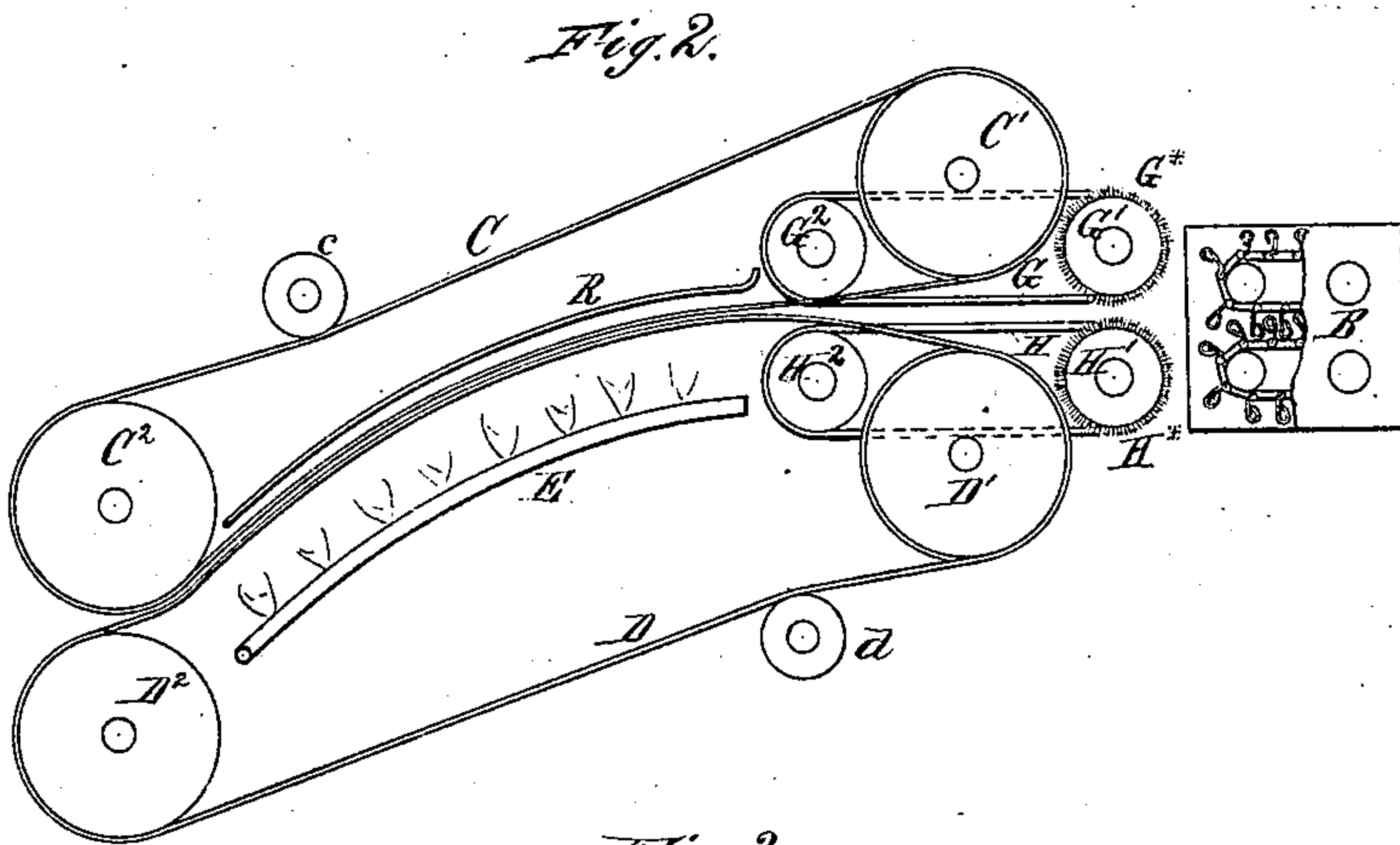
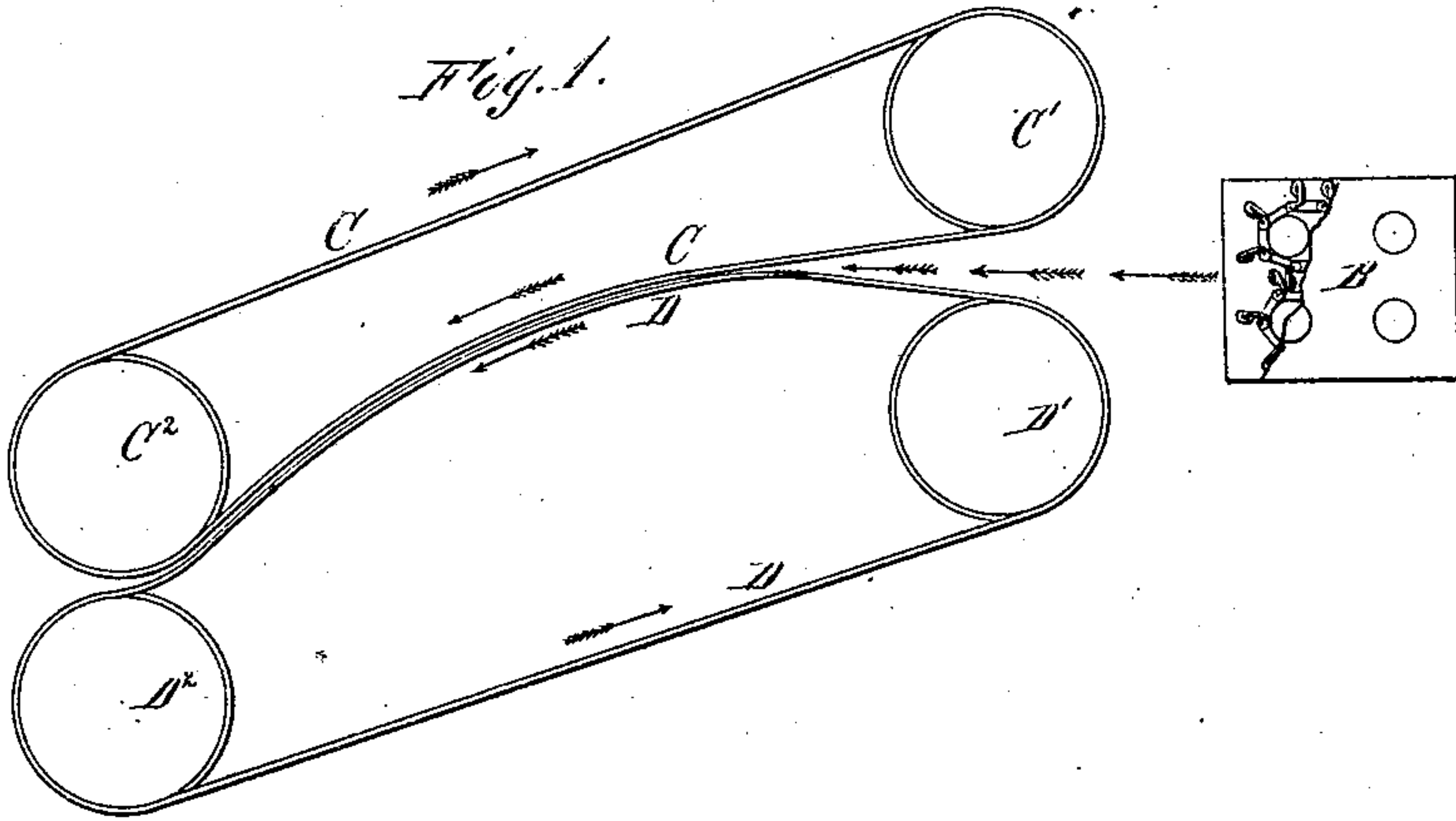


C. CLARK.  
Ruching-Machine.

No. 226,719.

Patented April 20, 1880.



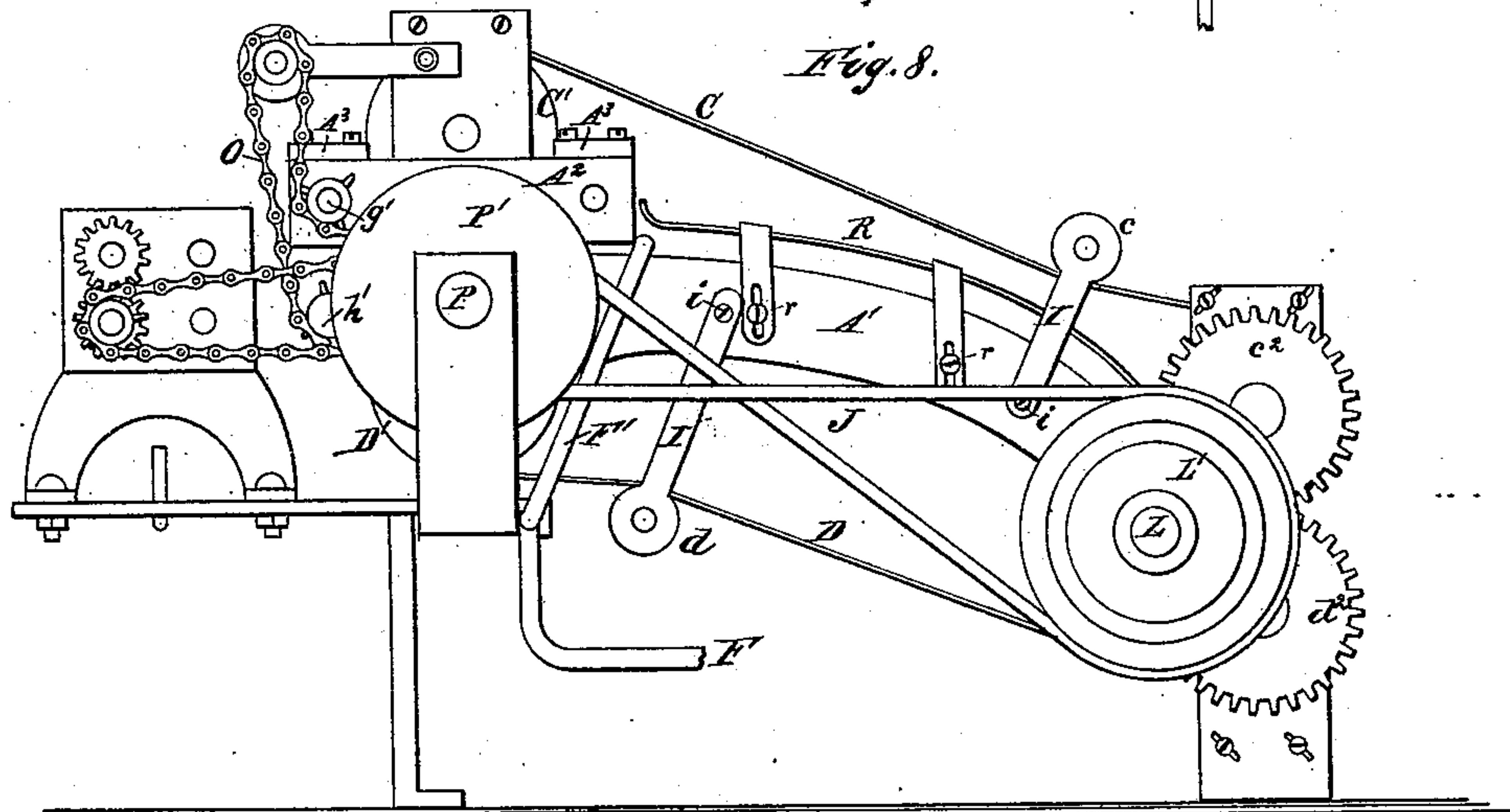
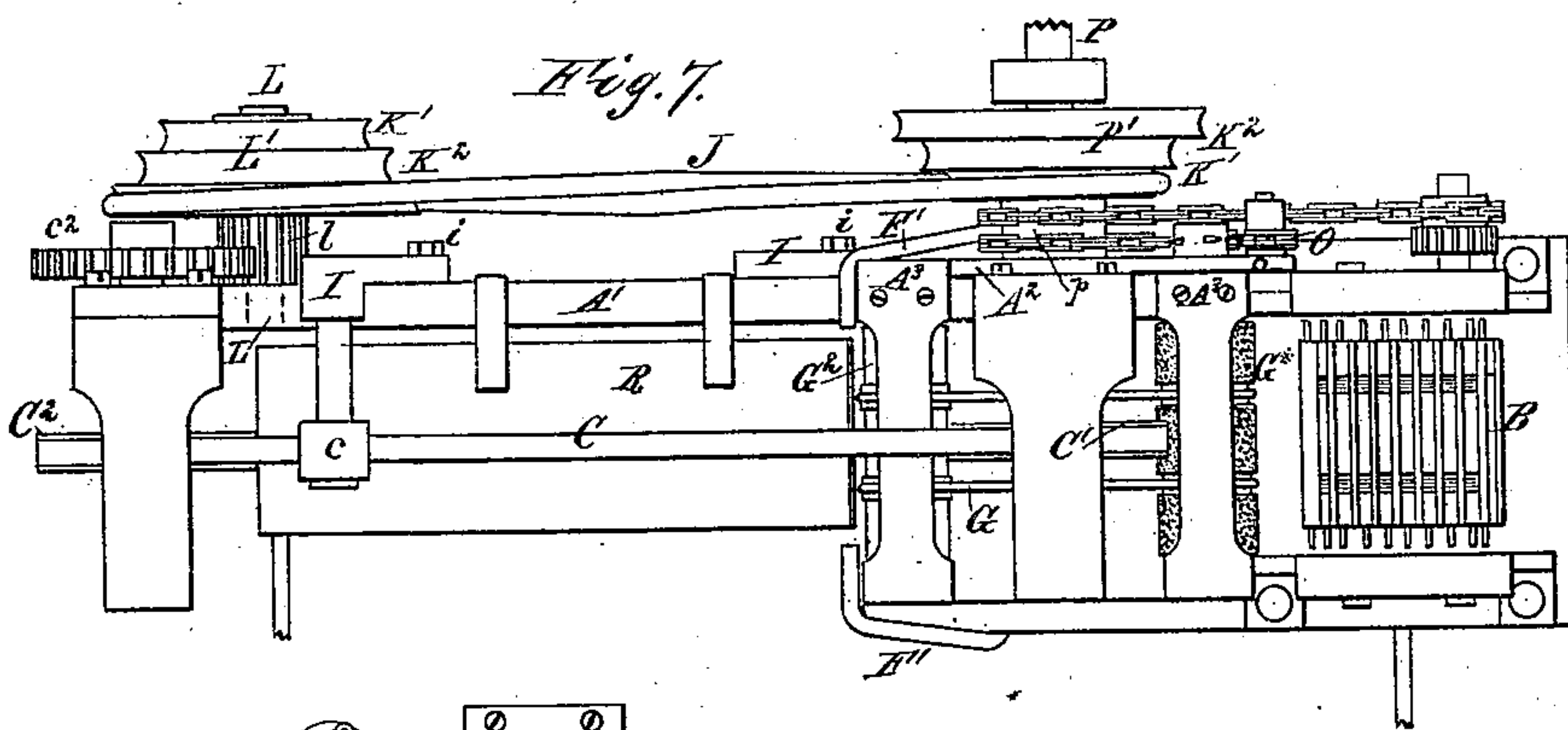
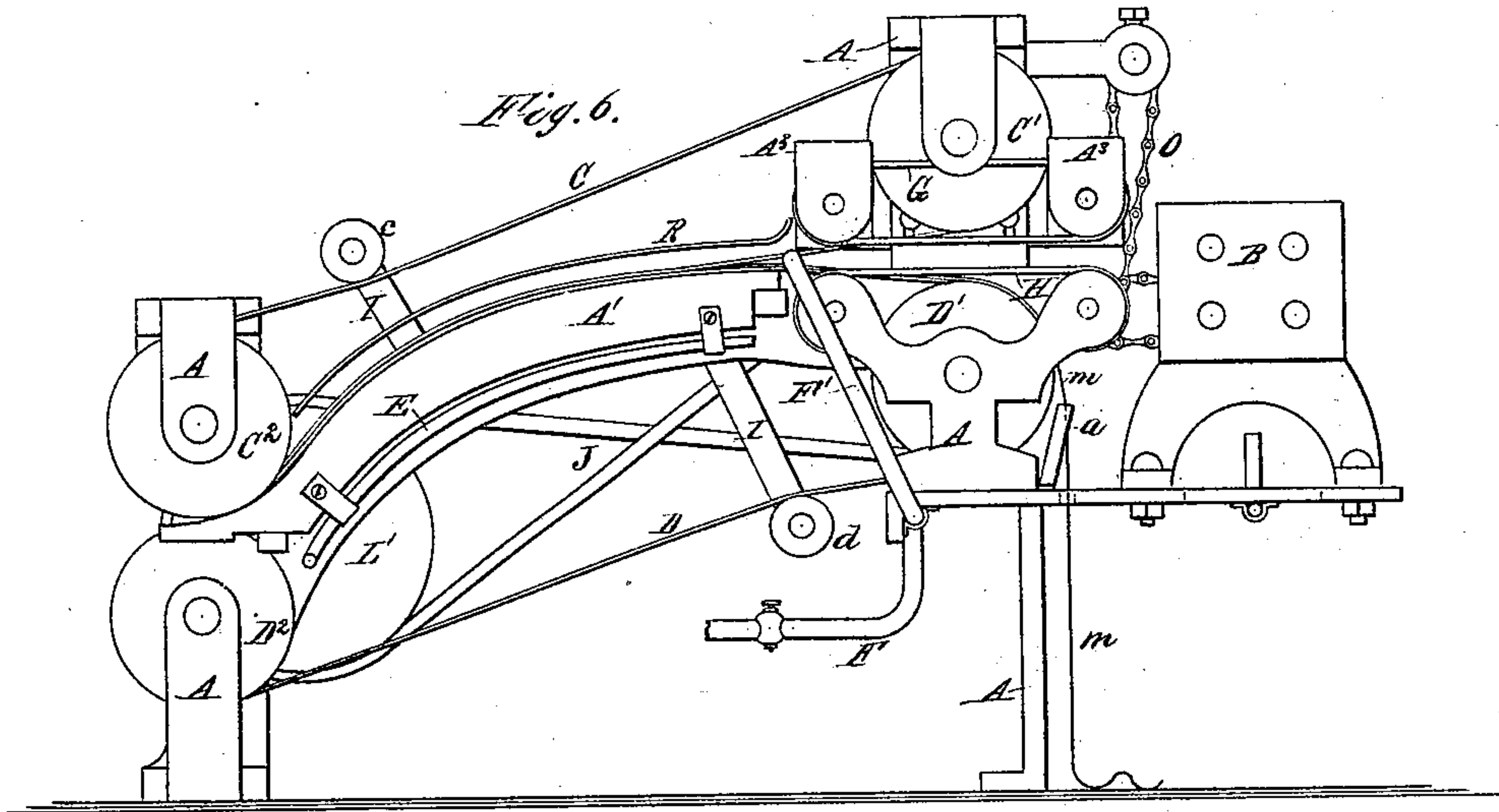
WITNESSES—  
Charles C. Stetson  
Wm C. Dey

INVENTOR—  
Cornelius Clark  
by his attorney  
Thomas S. Stetson

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WITNESSES—

Charles C. Stetson  
Wm C. Dey

INVENTOR—

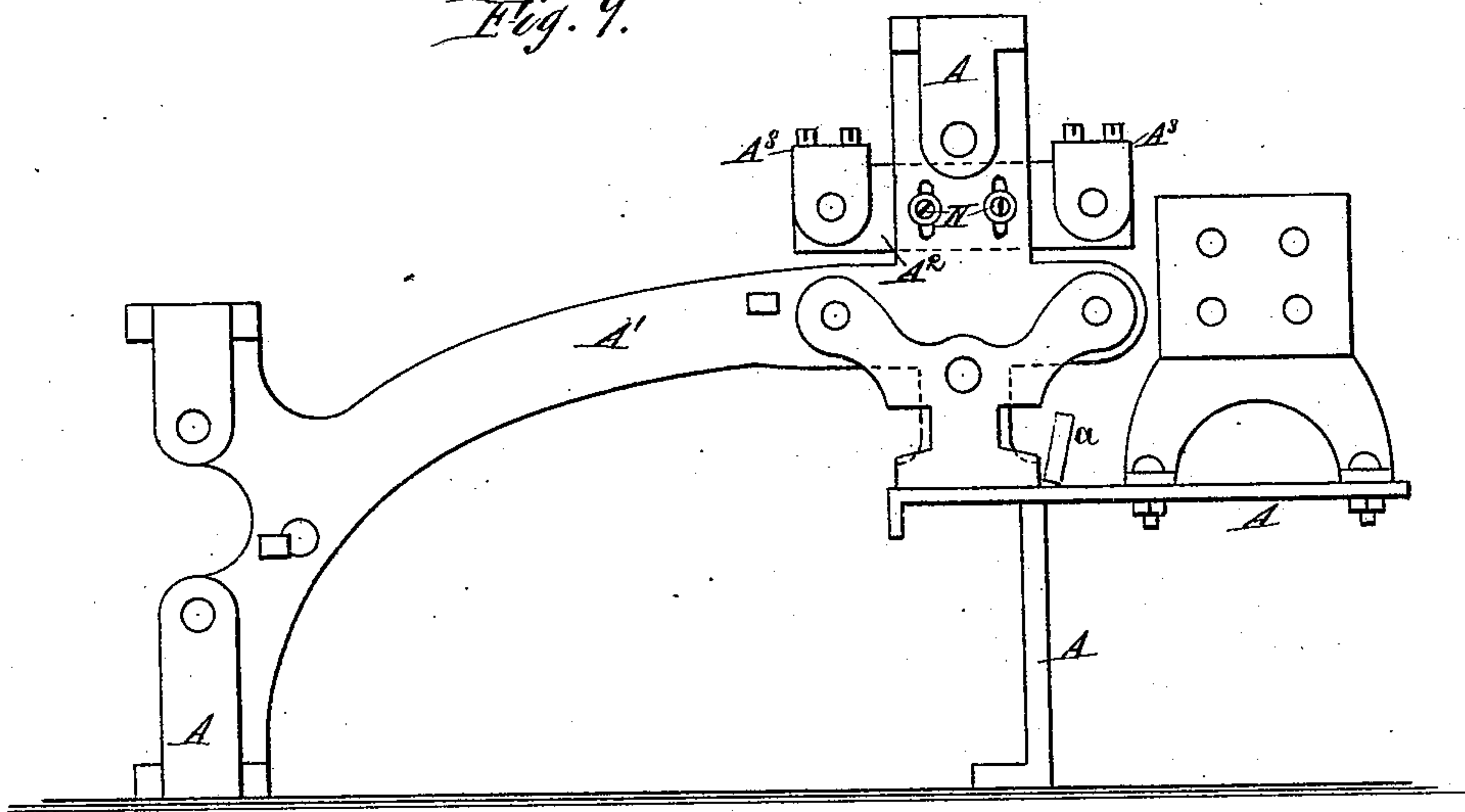
Cornelius Clark  
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*Fig. 9.*



WITNESSES—

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" "

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# UNITED STATES PATENT OFFICE.

CORNELIUS CLARK, OF BROOKLYN, ASSIGNOR TO HIMSELF AND CLINTON  
H. SMITH, OF NEW YORK, N. Y.

## RUCHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 226,719, dated April 20, 1880.

Application filed January 24, 1880.

*To all whom it may concern:*

Be it known that I, CORNELIUS CLARK, of Brooklyn, Kings county, in the State of New York, have invented certain new and useful  
5 Improvements relating to Machines for Making Ruches; and I do hereby declare that the following is a full and exact description thereof.

The accompanying drawings form a part of  
10 this specification, and represent what I consider the best means of carrying out the invention. The first three figures are mere diagrams to indicate the action of certain moving parts without obscuring or complexing the view by  
15 any representation therewith of the parts which support and impel the same.

Figure 1 is an edge view of certain metallic bands which receive the partially-formed fabric from an ordinary fluter and compress and  
20 carry forward the same, holding it by the middle of its breadth alone. Fig. 2 shows the same with certain important additions; and Fig. 3 is a plan view of these moving parts, corresponding to Fig. 2. The next two figures indicate the condition of the ruche on a  
25 larger scale. Fig. 4 is an edge view of the material as it comes from the fluter. At this stage the corrugations or bends extend evenly across the entire breadth of the double ruche  
30 which is to be formed. Fig. 5 is a cross-section through a piece of the ruche in a completed condition. Fig. 6 is a side view of the entire machine, or of so much thereof as involves the novel parts, and shows the relation  
35 thereof to the ordinary part—the fluter. Fig. 7 is a plan view of the same. Fig. 8 is a view of the back side, or the side from which the power is received, and which will usually be farthest from the attendant. Fig. 9 is a side  
40 view of the fixed framing alone, with the several moving parts removed.

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

I employ a substantial frame-work of cast-  
45 iron or other suitable material, designated generally by A. Certain parts will be denoted when necessary by additional marks, as A', A<sup>2</sup>, &c. This frame supports and adjusts the parts which perform the labor, and one por-

tion performs an important additional func- 50  
tion in receiving and imparting heat.

B B is a chain-fluter, of well-known construction, which performs its ordinary function of receiving a long strip of suitable woven  
55 material in a plane condition and discharging it bent into a series of uniform and graceful corrugations or flutes, each of which extends evenly across from one edge to the other. The parts which I have combined therewith take the material thus bent and flatten it down  
60 along a sufficient breadth along the center line, and hold it thus permanently flattened, so that on cutting afterward along the center two complete ruches are formed ready for binding and use in any of the ways in which such  
65 decorations are applied.

My invention allows for greatly varying the fullness of the plaits or corrugations without changing the fluter, and for applying cords or  
70 tapes to aid in holding the material. The material, being compressed together with heat, adheres with considerable force by the nature of its sizing. The heat is applied in two  
75 ways—by a gentle blowing of steam into the several corrugations or flutes from the edges, and by a direct application of fire to the metal upon which the fabric is compressed. I have in my experiments used the materials known  
80 as “tarlatan,” “organdie,” and “crêpe lisse.” I believe any proper material for ruches may be successfully worked by its aid.

C and D are endless metallic bands running at an equal and moderate rate over pulleys C' C<sup>2</sup> D' D<sup>2</sup>, and arranged to receive the  
85 fluted fabric as it comes from the fluter B and carry it slowly along, pressing it only to the limited breadth of these bands, and leaving a large portion at each edge in its gracefully-fluted condition. This carrying is performed  
90 in close contact with the curved part A' of the frame, the arrangement being such that the tension of the belts C D causes them to press together and upon the fixed surface, as will be obvious from the Figs. 1, 2, and 6.

E is a curved pipe, supplied with gas from  
95 the street-mains or other source by a connection of any ordinary kind, (not shown,) and discharging the same through a series of small



jets, so as to induce a nearly continuous flame under the curved part A' of the frame.

F is a pipe having bent branches F' F', supplied with steam at a moderate pressure from a boiler or other source. (Not shown.) Each branch directs a gentle current of steam into the several flutes of the fabric as they pass. By the combined dampening and heating effect of the steam and the pressing and heating due to the carrying between the narrow metal belts over the curve A' the ruche is effectually flattened and stuck together in the flattened condition. It emerges flat along the middle and frilled each side, so that cutting along the middle makes two ruches; but, thus held only by the slight adhesion and stiffness, a little tension might derange it. I introduce the necessary longitudinal cords to resist tension in the process of manufacture. I will mark the main fabric M, and these cords *m*. The cords *m* are supplied in a wet condition from balls of cord immersed in a vessel of water, (not shown,) and are led up through guides *a*, which may be merely deep notches in the framing or in a part bolted thereto, and are led between the belts C D, so as to lie parallel in the desired positions on the lower belt, D, and be caused to adhere in those positions to the double ruche formed. When the double ruche is divided one cord *m* goes with each part.

The belts C D may be adjusted in tightness by the tightening-pulleys *c d*, carried on adjustable arms I, secured by bolts *i*, as shown. At the point where they receive the fluted stuff they are wide apart; but as they move forward they gradually approach, and by the time the steam is injected and the hot portion A' of the frame begins to be traversed over, the belts are pressing together and upon the hot frame with the required degree of force. I can increase the length of the curved part A' and of the belts C D, with a corresponding change in the position of the pulleys C<sup>2</sup> D<sup>2</sup>, so as to give a longer time for the heat and compression, if desired. I have, for convenience of illustration, shortened those parts. In my experiments I have made the pulleys C' C<sup>2</sup> D' D<sup>2</sup> about eight inches in diameter, and made the curved part of the framing A' forty-two inches long. I mount the rolls C<sup>2</sup> D<sup>2</sup> almost in contact, but the rolls C' D' about two and one-half inches apart.

The proper transference of the newly-fluted material from the fluter B into the open space between the belts C D is greatly aided by what I term "receiving" and "delivering" belts G H, running over pulleys G' G<sup>2</sup> H' H<sup>2</sup>. (Shown in all the figures except Fig. 1.) These belts G H are of leather, rubber, or some analogous material having the property of exerting considerable force in controlling, dragging, or restraining with only a gentle pressure, and are arranged on each side of the center line of the fabric, so that they leave center space unobstructed, ready for the metal belts C D to

close together there, while the leather belts G H travel along each side. The belts G H run faster. There is a tendency of the newly-fluted fabric to extend itself again as soon as it emerges from the fluter. It is the function of these belts G H to seize it and run away with it at such a speed as to allow of such partial straightening; but as soon as the rapid belts G H have carried the half-opened flutes forward into the gradually-contracting space between the slow metallic belts C D the motion of the fabric is restrained and the flutes are compressed against each other again. I can so operate as to compress or condense them to just about their original form, as induced by the fluter B, or to a greater or less extent. This depends mainly or entirely on the speed of the metal belts C D, which may be varied relatively to the speed of the fluter B and of the other parts by shifting the belt J upon the cone-pulleys K' K<sup>2</sup>, as will be understood from the drawings. (See Figs. 7 and 8.)

The pulleys C<sup>2</sup> D<sup>2</sup> are geared together by the wheels *c<sup>2</sup> d<sup>2</sup>*, and receive their motion through the gear-wheel *l* from the shaft L, which carries a cone-pulley, L', or a set of different-sized pulleys in the position the reverse of the corresponding pulleys P' on the shaft P, which receives the motion through a belt from the driving-power. (Not shown.)

The transference of motion between the other parts requires no especial description, except, perhaps, that to the belts G H. I make the distance between these belts adjustable by mounting the pulleys G' G<sup>2</sup> on adjustable portions A<sup>3</sup> of the framing, which, being fixed on the stout bar A<sup>2</sup>, held by screw-bolts N, inserted through the slots shown, may be raised and lowered, as required, to give a greater or less hold on the fluted fabric. The belts G H may, by such adjustment, be made to take hold of any ordinary quality of goods or size of flutes with just sufficient force to convey it away promptly and prevent its sagging down as it emerges from the fluter B, and still with too little force to deform the delicate corrugations or to seriously affect them when they are nearly arrested in the gripe of the slower-moving belts C D. The required motion is communicated to pulleys *g' h'* on the overhung end of the shafts of G' H' by a pitch-chain, O, running on a properly-spiked or sprocket wheel, *p*, on the driving-shaft P, the pulleys *g' h'* being similarly spiked. A similar device is, for convenience, adopted for driving the fluter B.

I apply the terms "rob" and "reef" to the effect produced on the ruches by changing the belt J from one position to another on the cone-pulleys K' K<sup>2</sup>. When it extends the flutes, so as to require less material per yard, the term "rob" applies; when it compresses together, so as to form a richer ruche by pulling the plaits more together, I term it "reefing."

The pulleys G' G<sup>2</sup> H' H<sup>2</sup> are nearly uniform cylinders, except that grooves are formed or



other provisions are made for guiding the narrow belts G H. The surfaces of the pulleys G' H' where the narrow belts do not come are covered with brush material or card material G\* H\*, so as to give the effect of brushes to better seize the fluted fabric and draw it into the space between the belts G H. With these pulleys thus roughened the belts G H may be made very smooth, as of fine polished wire, and the device will succeed well.

R is a detachable curved plate fitted closely over the upper band, C, where it runs forward in the act of compressing and carrying the fluted material. It confines the vapor introduced by the pipes F' and generated by the hot surface A', and causes it to be diffused more equally throughout the half-formed ruche. It is removed when desired by unscrewing the bolt r. It retains the heat and aids not only the uniformity but also the rapidity of the drying.

Modifications may be made in the forms and proportions of the details. I believe some of the features may be made useful without the whole. Thus, for example, the belts C D and the curved frame A', with provisions for heating and adjusting, may be used without the belts G H. The latter may be used without the brush material on the rollers or pulleys, and steam may be used at a different point from the pipes shown, or can be dispensed with altogether if the material is suitable. I can use steam instead of gas-flame to heat the curved way A'; but I prefer the whole as shown.

It will be understood that the ruches may be greatly varied in width. I propose to adapt the machine for the widest double ruche likely to be required, and then all the narrower fabrics can be worked either with or without such changes as dispensing with some of the belts G H. For some goods only one belt, G and H, on each side of the center will be required for any ordinary width. The invention is thus shown in Fig. 7.

Two or more of the cords m may be run through each guide a, and worked into each single ruche. It will be understood that the ruche will for many or most purposes require binding on the flattened edge after cutting apart from its mate.

I do not confine the use of the machine to the working of any particular material or the

manufacture of articles of any particular name.

I claim as my invention—

1. In a ruching-machine, the combination, with the fluter B, of the metallic belts C D, arranged to compress a portion of the ruche the proper width and to carry it forward in a compressed condition, as herein specified.

2. In a ruching-machine, the receiving and delivering bands G H, fluter B, and compressing-bands C D, combined and arranged for joint operation as and for the purpose herein specified.

3. In a ruching-machine, the curved framing A' and gas-pipe E, with jets for flames, as described, in combination with the compressing-bands C D, and means, B G H, for throwing the fabric into corrugations or flutes and introducing it into the compressing and carrying mechanism, as herein specified.

4. The steam-pipes F F' F', arranged as shown relatively to the curved way A', carrying and compressing parts C D, and fluter B, for the purposes herein specified.

5. In a ruching-machine, the cone-pulleys K' K and belt J, in the connection between the compressing and carrying belts C D, and the fluter B, in combination therewith, and adapted to serve in varying the fullness of the ruches, as herein set forth.

6. The brush material or equivalent roughening, G\* H\*, on the pulleys G' H', between the belts G G H H, in combination with such belts and with the fluter B, compressing and carrying bands C D, and means for applying heat to the compressed fabric, as herein specified.

7. In a ruching-machine, the heated way A', steam-injecting pipes F', and compressing and carrying bands C D, combined, as shown, with each other and with a fluter, B, suitable means, G H, for aiding the transfer of the fluted fabric, and means, R r, for covering in the heated way and the fabric traversing it, as herein specified.

In testimony whereof I have hereunto set my hand this 21st day of January, 1880, in the presence of two subscribing witnesses.

CORNELIUS CLARK.

Witnesses:

URIAH WELCH,  
CHARLES C. STETSON.