

(No Model.)

3 Sheets—Sheet 1.

G. E. GRIMM.
PAPER BOX MACHINE.

No. 576,980.

Patented Feb. 9, 1897.

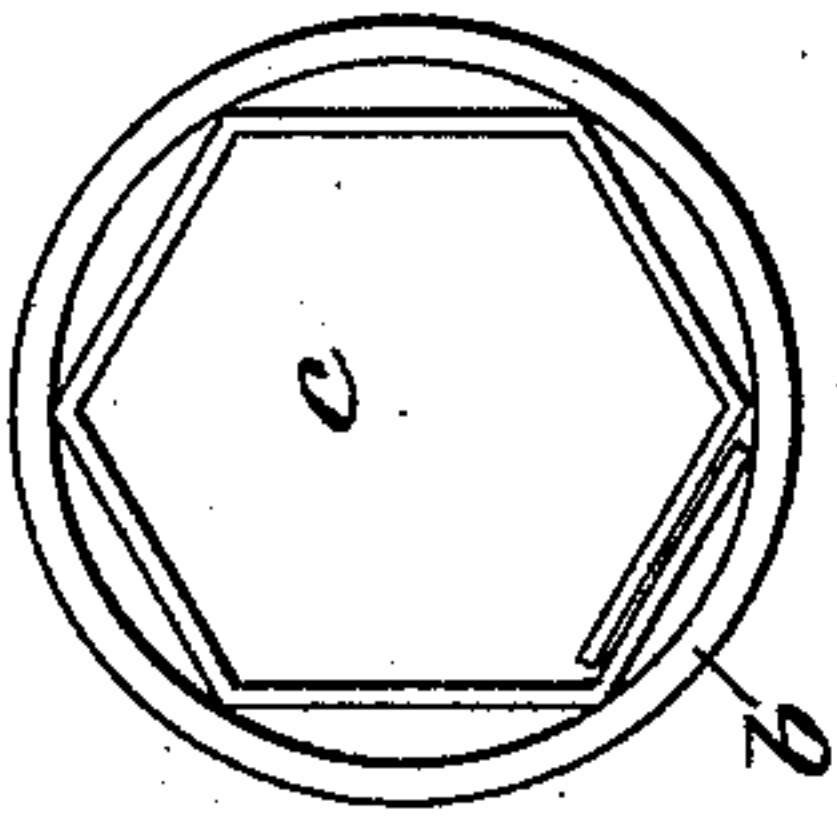
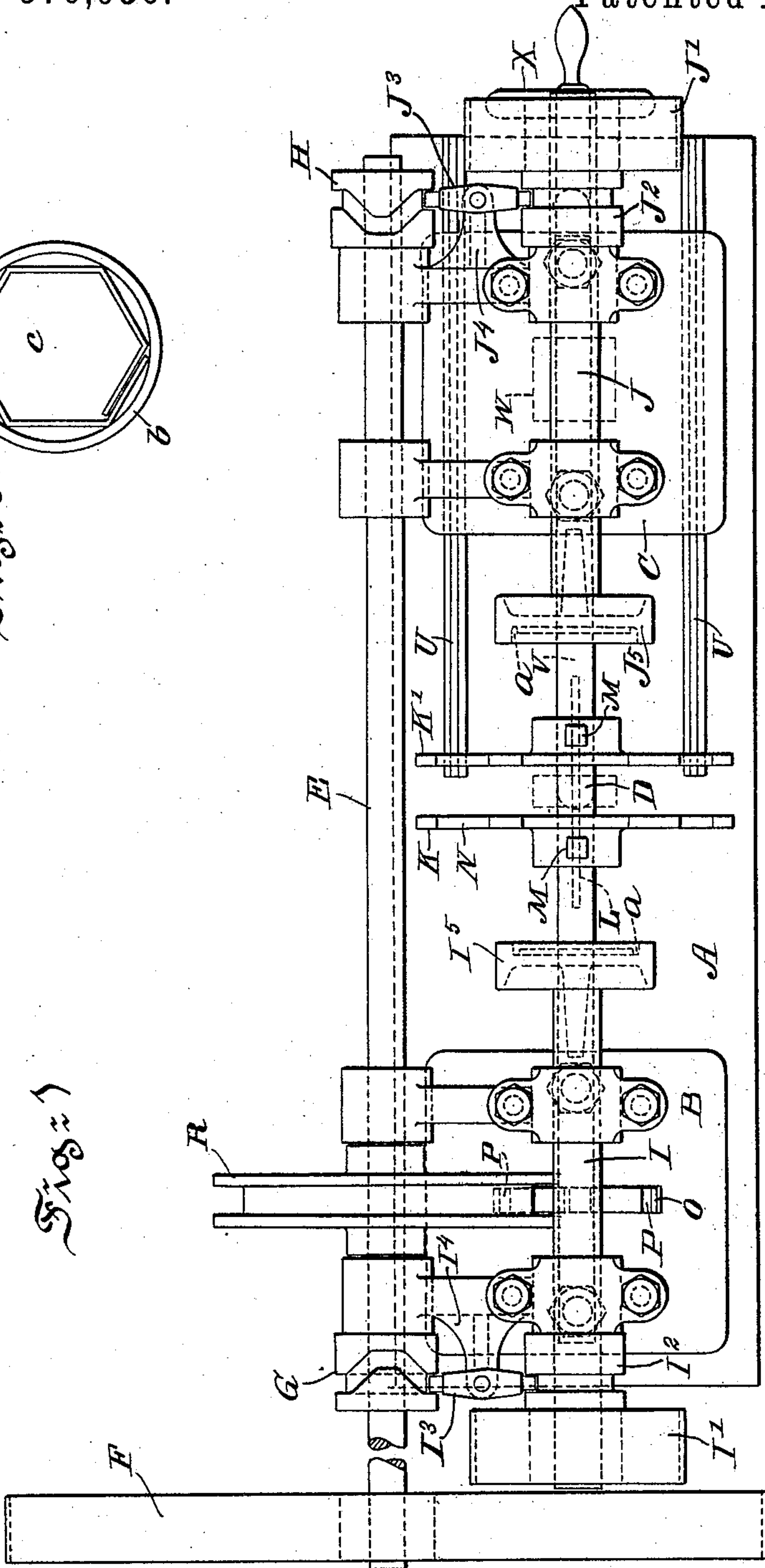


Fig. 6

Fig. 1



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J. L. Moister

Inventor.
Gerhardt E. Grimm
by his attorney
Chas. A. Rutter.

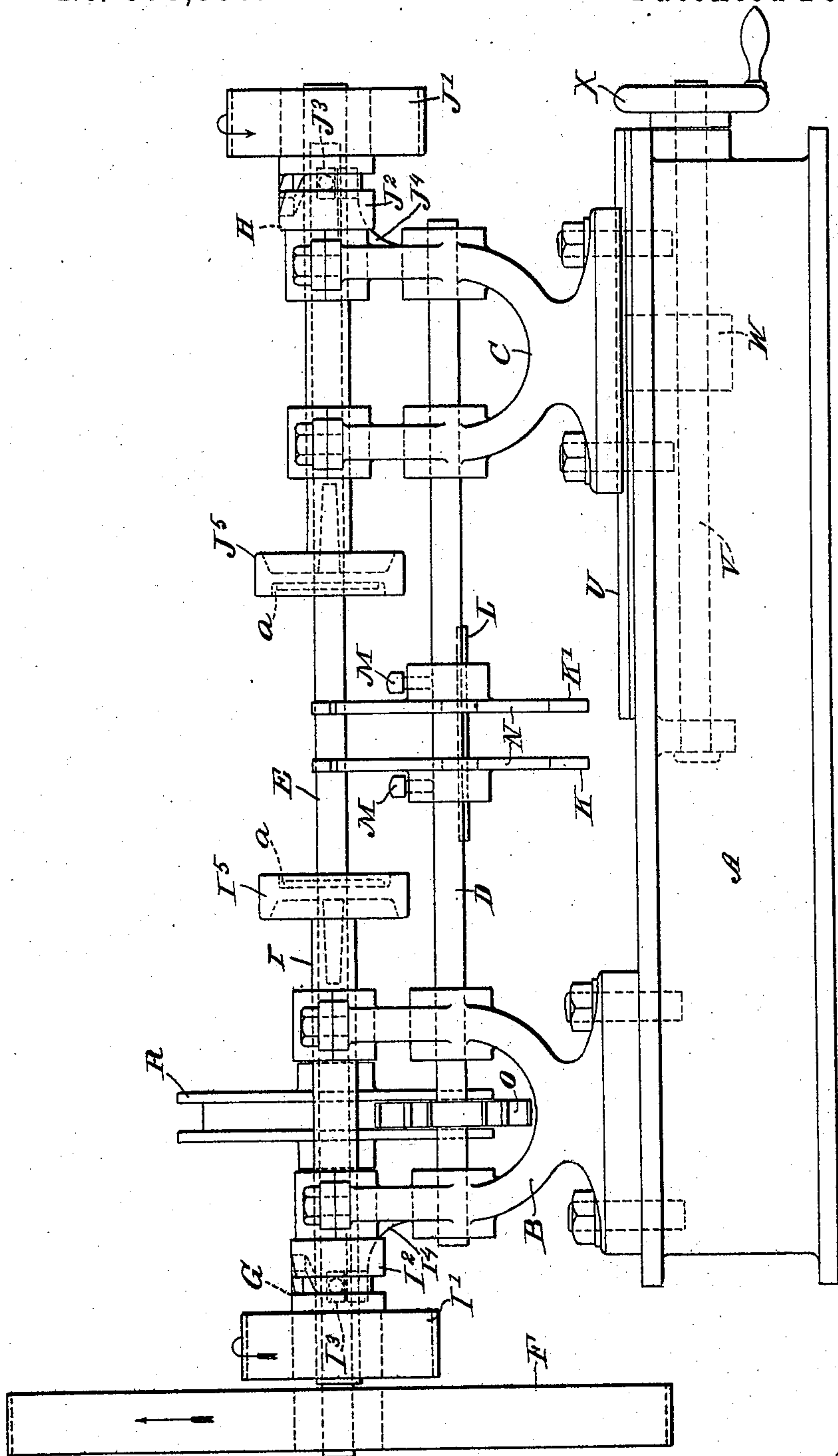
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W. A. Schaefer.
J. L. Moister

Inventor:
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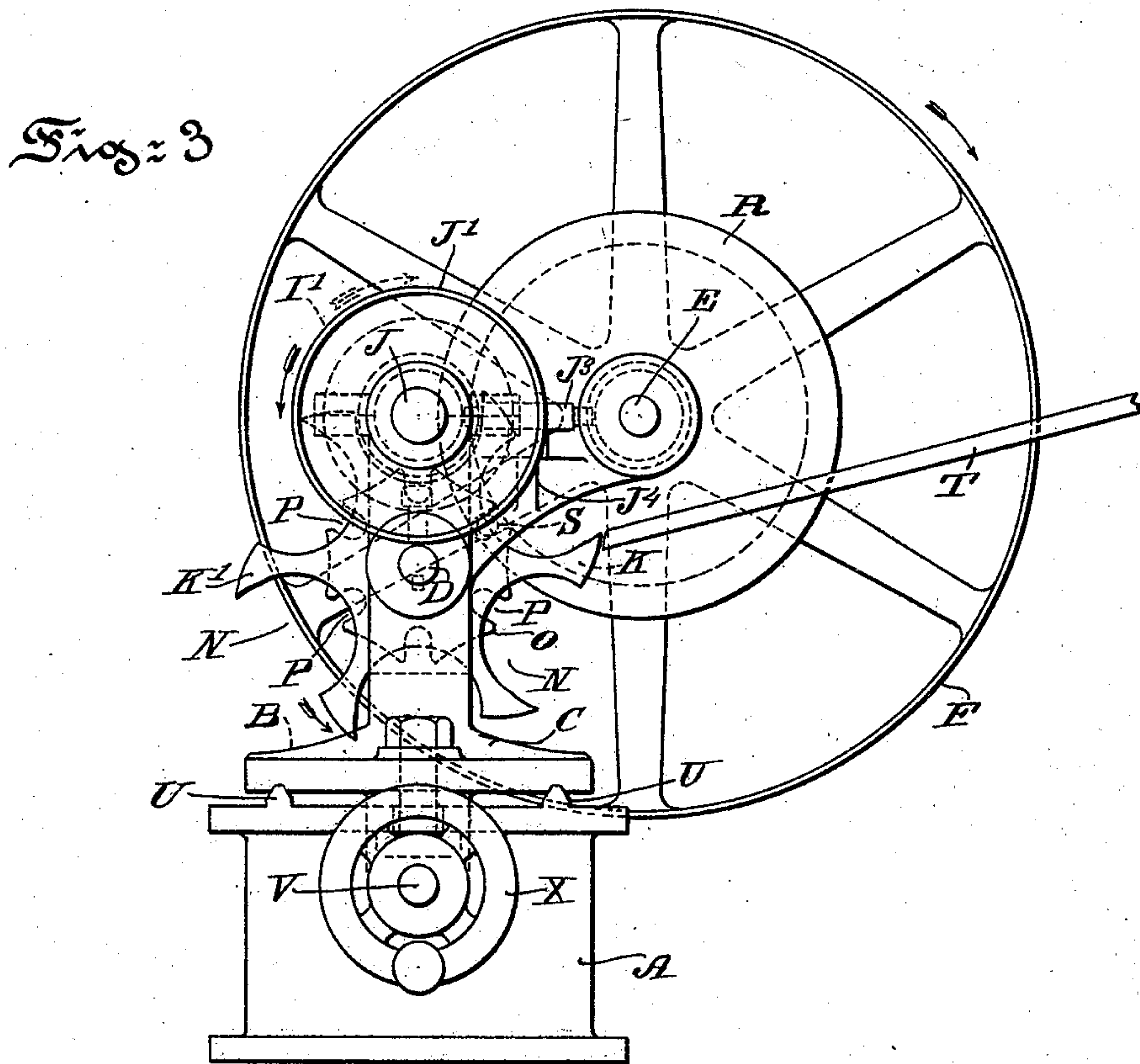
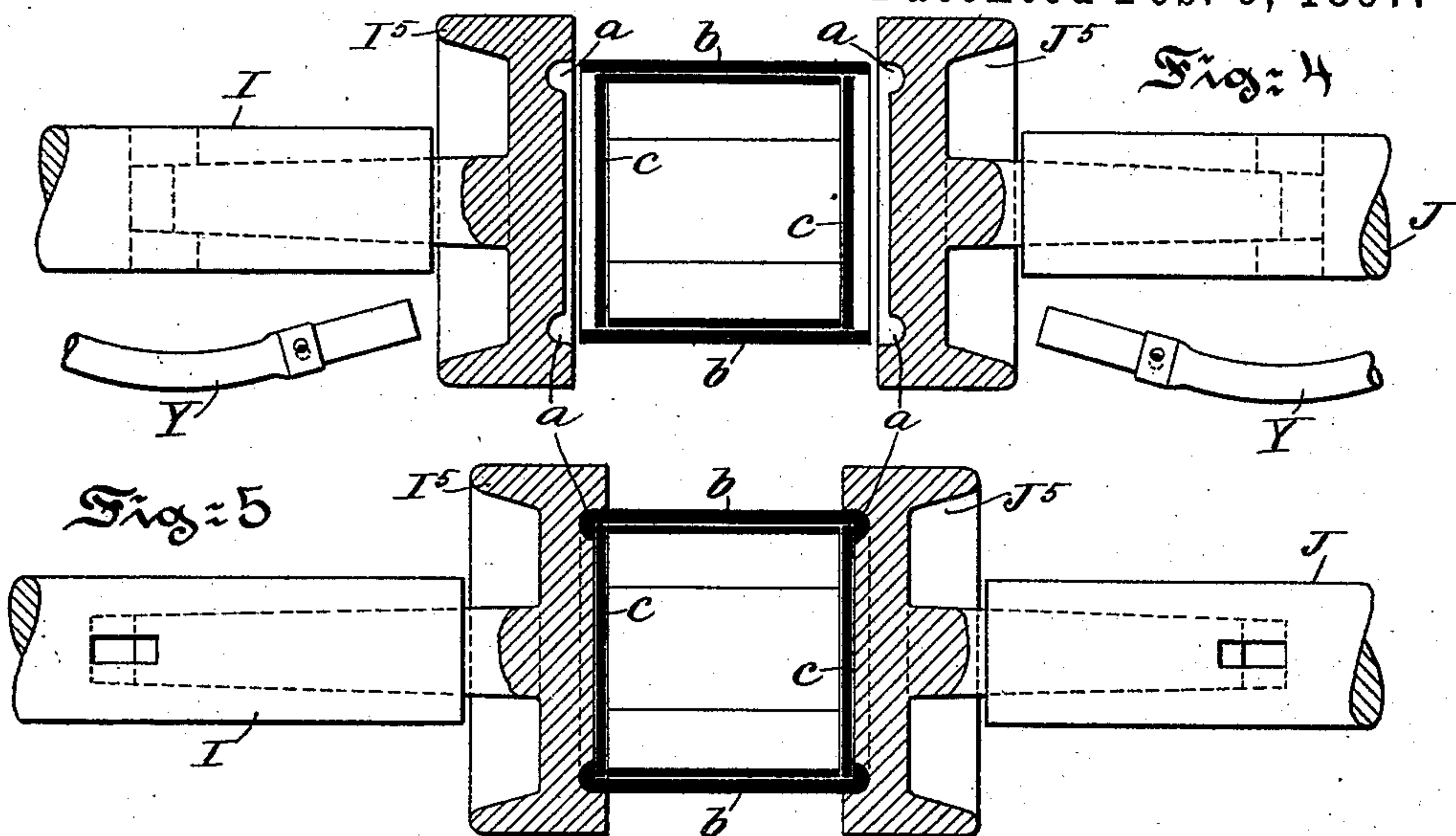
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3 Sheets—Sheet 3.

G. E. GRIMM.
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Patented Feb. 9, 1897.



Witnesses:
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UNITED STATES PATENT OFFICE.

GERHARDT E. GRIMM, OF CAMDEN, NEW JERSEY.

PAPER-BOX MACHINE.

SPECIFICATION forming part of Letters Patent No. 576,980, dated February 9, 1897.

Application filed April 13, 1896. Serial No. 587,275. (No model.)

To all whom it may concern:

Be it known that I, GERHARDT E. GRIMM, a citizen of the United States, and a resident of the city and county of Camden, State of New Jersey, have invented certain new and useful Improvements in Paper-Box Machines, of which the following is a specification.

My invention relates to improvements in paper-box-making machinery, and more particularly to improvements in machines for turning over the ends and securing in place the heads of cylindrical paper boxes, my machine being particularly adapted to the manufacture of ribbon-blocks, that is, cylindrical boxes with closed ends upon which ribbons are wound and sold.

In the accompanying drawings, forming part of this specification, and in which similar letters of reference indicate similar parts throughout these several views, Figure 1 is a plan of my paper-box machine; Fig. 2, a side elevation; Fig. 3, an end elevation; Fig. 4, a central sectional elevation through a ribbon-block before the ends are closed and through the spinning-heads which turn the ends of the box over upon the heads; Fig. 5, a similar view, the ends of the box being turned over and the spinning-heads closed upon them; and Fig. 6 an end view of a ribbon-block, one of the heads being removed, showing the bearing which engages the inner sides of the heads, preventing them from being forced inward.

A is the bed of the machine; B C, housings carried by bed A, the former preferably stationary and the latter preferably movable longitudinally upon the bed.

D is a shaft carried in bearings in the housings B C; E, a shaft carried in bearings in the housings B C. This shaft I call the "main" shaft.

F is a pulley on shaft E; G H, cams carried upon and turning with shaft E.

I J are arbors turning in bearings in housings B C.

I' J' are pulleys by means of which these arbors may be revolved in opposite directions.

I² J² are grooved collars fast to I J.

I³ J³ are levers pivoted to brackets I⁴ J⁴, carried by or forming part of housings B C. One end of lever I³ engages the cam G and the other the slot in collar I², and one end of

lever J³ engages cam H and the other end the slot or groove in collar J².

I⁵ J⁵ are spinning-heads or crimpers, the former carried by the inner end of arbor I and the latter by the inner end of arbor J.

The arbors I J, as shown in the drawings, are in line and the spinning-heads directly opposite one another. The spinning-heads are furnished with an annular groove *a*, the outer edge of which is deeper than the inner, for a purpose hereinafter described.

K K' are two disks, forming a carrier, carried by shaft D. They may be moved toward or away from one another for adjustment and are prevented from turning on the shaft by a feather L. M are set-screws by means of which these disks may be fastened to the shaft. The disks K K' are furnished upon their peripheries with notches N, (best shown in Fig. 3,) which are adapted to hold the ribbon-blocks and carry them to the spinning-heads.

The heads of the ribbon-blocks are placed in the cylindrical parts by hand or otherwise, and these blocks are then placed upon an inclined feeding-table T, down which they run by gravity and fall into the notches N as the disks K K' are turned.

The device for rotating the shaft D and disks K K' is constructed as follows: O is a star-wheel fast to shaft D, which is furnished with as many notches P as there are notches N in the peripheries of the disks K K'. R is a wheel carried by and turning with main shaft E, which carries one tooth S, Fig. 3, which is adapted to engage one of the notches P upon each revolution of the shaft E and move the star-wheel, the shaft D, and the disks around one space.

The operation of the machine is as follows: The pulley F is driven by a belt and counter-shaft (not shown) and causes the main shaft E to be constantly revolved. The pulleys I' J' are also driven by suitable belts other than the belts that drive the main shaft, one in one direction and the other in the other direction, and the arbors I J and the spinning-heads I⁵ J⁵ are thereby rotated constantly and in opposite directions. This prevents the box from rotating while being crimped. The boxes or ribbon-blocks, the ends of which are to be spun over the heads, are fed to the feeding-

table T, and one drops into the notch N in the disks K K', which are now opposite the feeding-table. As soon as this happens the tooth S on disk or wheel R engages one of the notches in the star-wheel O and moves this wheel, the shaft D, and the carrier or disks K K' one space forward, bringing the box to a position directly in line with the spinning-heads I⁵ J⁵. The cams G H on main shaft E now move the outer ends of levers I³ J³ outward and throw their inner ends inward, and hence the grooved collars I² J², the arbors I J, and the spinning-heads I⁵ J⁵ are moved inward, the annular grooves *a* in the latter, which are of the same diameter as the sides *b* of the box, as shown in Figs. 4 and 5, engaging the ends of the sides of the box, and as the spinning-heads are rapidly revolved in opposite directions the ends of the sides of the box are turned or crimped over the heads *c*, as shown in Fig. 5. As soon as the heads are secured in place the cams G H cause the levers I³ J³ to move collars I² J², arbors I J, and spinning-heads I⁵ J⁵ outward, releasing the box, and at this instant the tooth S engages another notch P in the star-wheel and the operation above described is repeated.

It will be observed that the arbors and spinning-heads are given, in addition to their rotary movement, an intermittent reciprocating movement longitudinally.

The inner edges of the slots *a* in the spinning-heads or crimpers are lower than the outer edges, so as to permit the crimping to be performed without the central part of the heads engaging and pushing in the heads of the box during the operation of crimping.

In order to prevent the boxes from being jarred out of the notches N in disks K K' when these disks are started by the pin or tooth and star-wheel, the under or after sides of the notches are made longer than the forward sides, as shown in Fig. 3.

For boxes or blocks of different diameters the spinning-heads I⁵ J⁵ have to be changed, and for boxes or blocks of different lengths the head or housing C may be moved in or out to bring the spinning-heads closer together or farther apart. For this latter purpose I have furnished the bed A with guides U, upon which housing C travels, and I have furnished a screw V, which passes through a nut W, carried by bearing C, which may be operated by a crank or hand wheel X in order to move the housing C in or out.

I have shown in Fig. 4 two Bunsen burners Y Y', by means of which the heads I⁵ J⁵ may

be heated. In some cases it is advisable to dampen the edges of the box before spinning, and when this is done it is better to heat the spinning-heads, so that the spun edges of the box may be rapidly dried.

The speed with which the boxes or blocks are fed to the crimping mechanism and the reciprocating movements of this mechanism are determined by the speed of the pulley F and shaft E, which are run entirely independently of the rotary movement of the spinning-heads or crimpers.

Having thus described my invention, I claim—

1. In a machine for operating upon the heads of cylindrical boxes, the combination of two housings mounted upon the bed of the machine, means for adjusting one of said housings to vary the distance between them, arbors and spinning-heads carried by said housings, means for rotating said arbors in opposite directions, means for imparting intermittent longitudinal movements to said arbors, an intermittently-movable carrier arranged to carry the boxes to the spinning-heads, and a shaft for the carrier, said carrier being laterally adjustable upon its shaft, substantially as described.

2. In a machine for operating upon the ends of cylindrical boxes, the combination of two housings mounted upon the bed of the machine, a nut and screw for adjusting one of said housings upon the machine-bed, a main shaft carried in bearings upon the housings, arbors and spinning-heads carried by said housings, cams upon the main shaft, grooved collars upon the arbors, and levers mounted upon the housings and arranged to engage the cams and the carriers whereby a reciprocating movement is given to the arbors at each revolution of the main shaft, substantially as described.

3. The combination with the main shaft, the arbors and spinning-heads, the carrier-shaft and carrier, and means for operating said shaft and arbors, of a stationary housing furnished with bearings for carrying one end of said shafts and one arbor, and a laterally-movable housing adapted to carry the other ends of said shafts and the other arbor, all substantially as and for the purposes set forth.

GERHARDT E. GRIMM.

Witnesses:

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