

No. 770,159.

PATENTED SEPT. 13, 1904.

L. S. BURBANK.

MACHINE FOR MAKING CARTONS OR FOLDING BOXES.

APPLICATION FILED DEC. 21, 1899.

3 SHEETS—SHEET 1.

NO MODEL.

Fig. 1.

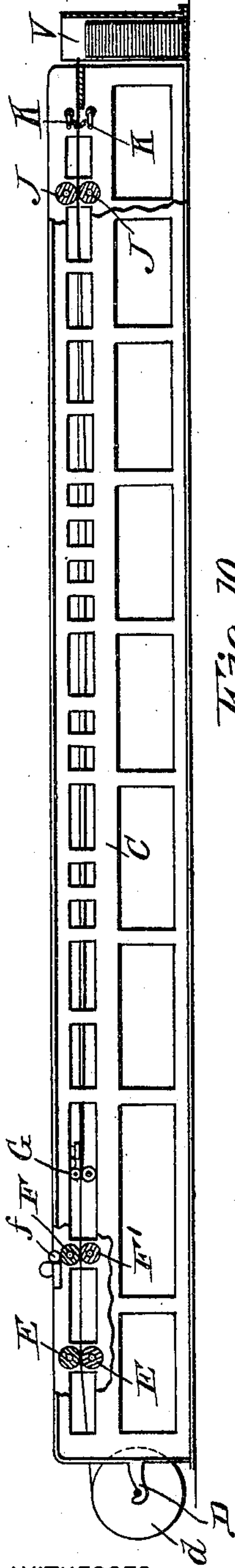


Fig. 10.

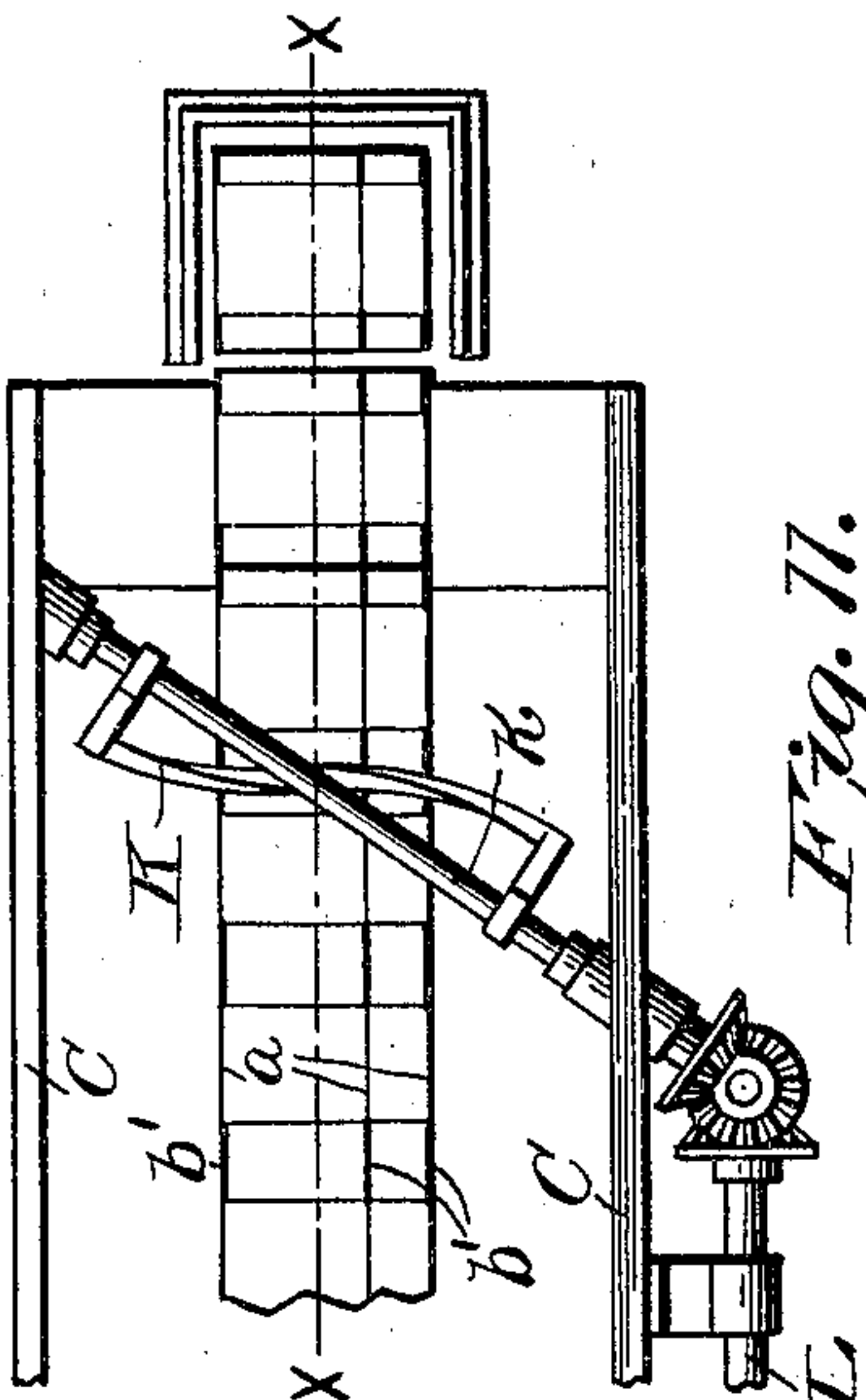


Fig. 11.

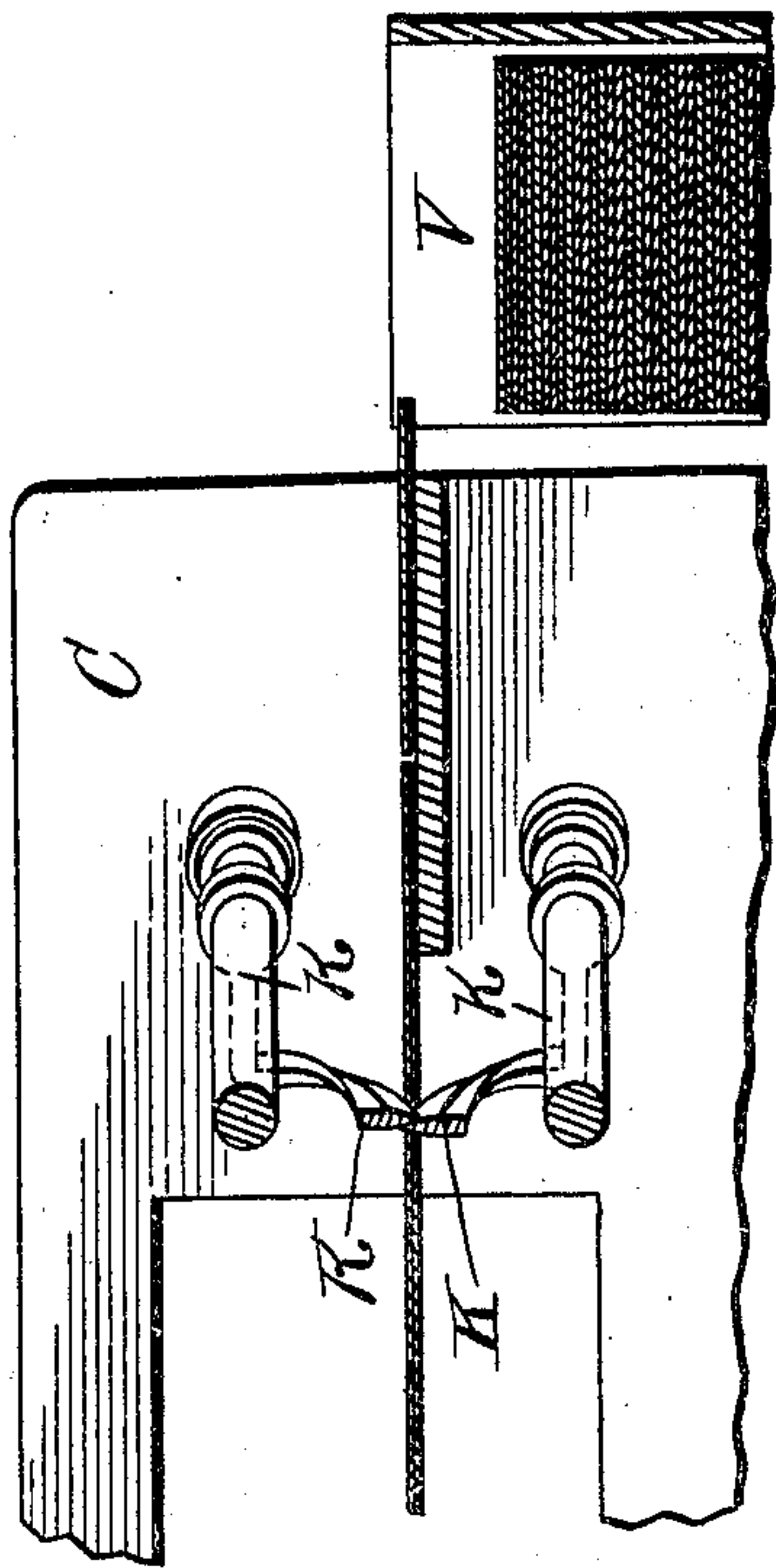


Fig. 12.

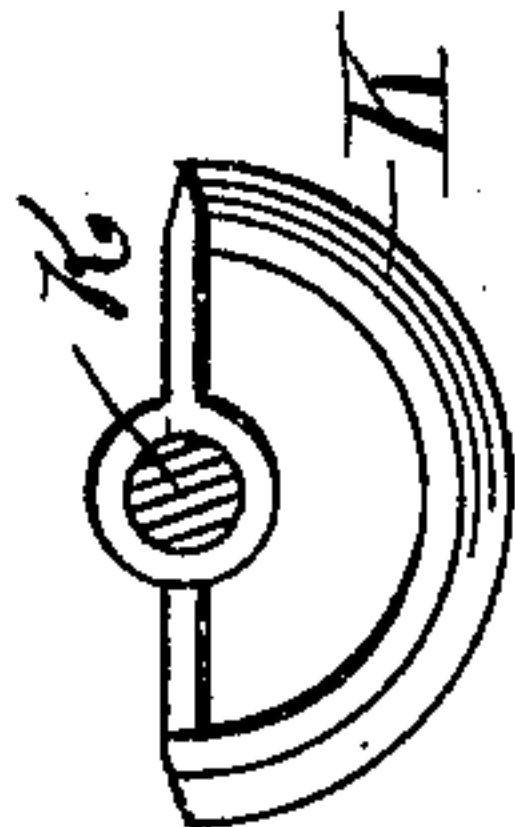
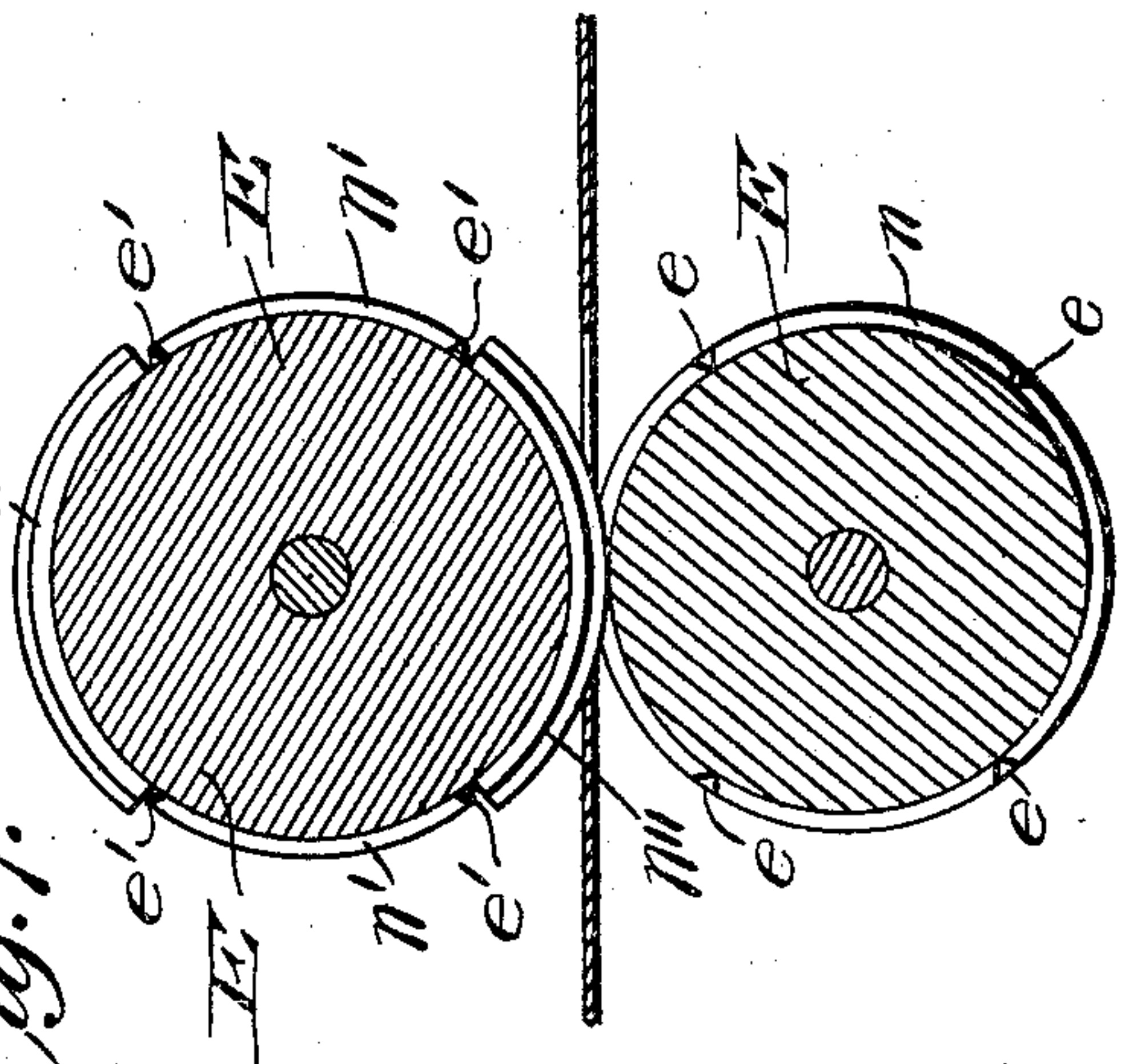


Fig. 9.



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3 SHEETS—SHEET 2.

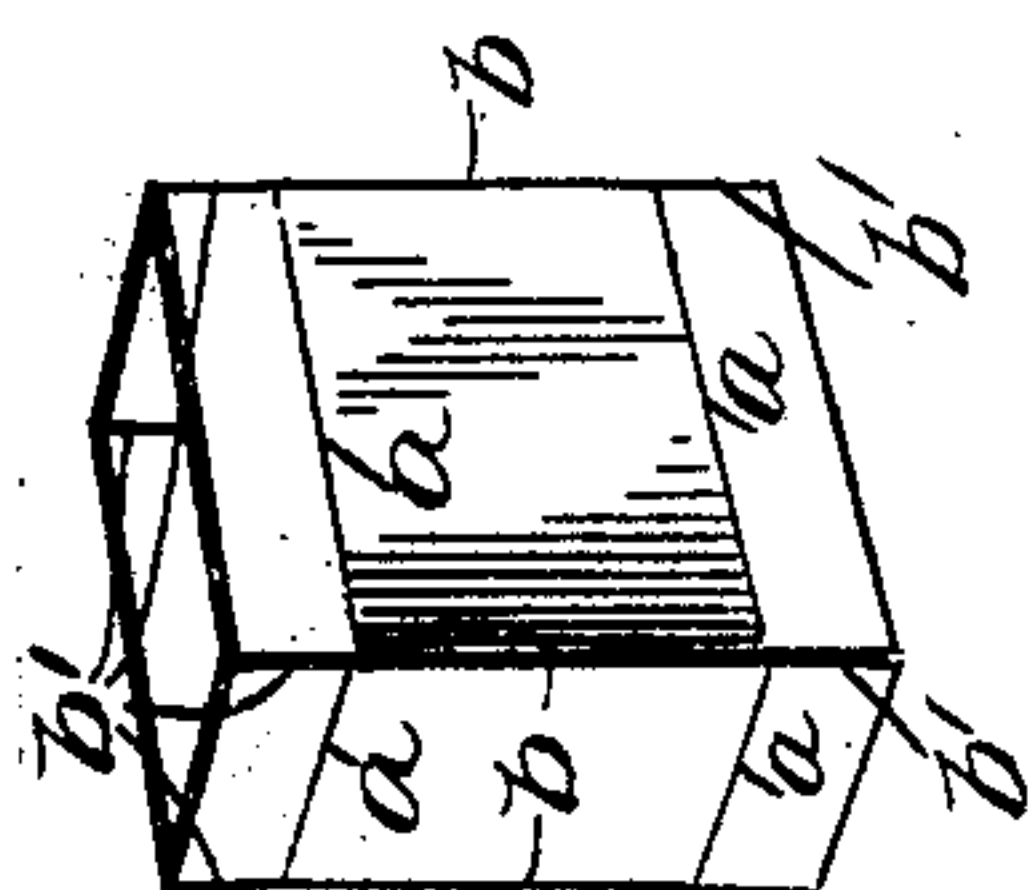


Fig. 14.

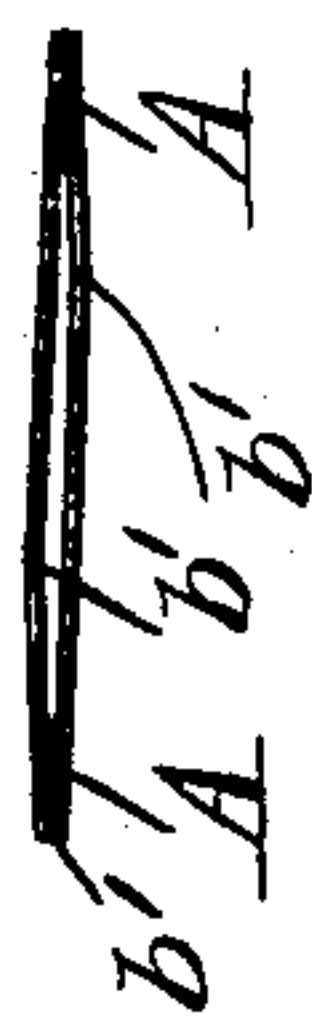


Fig. 13.

Fig. 12.

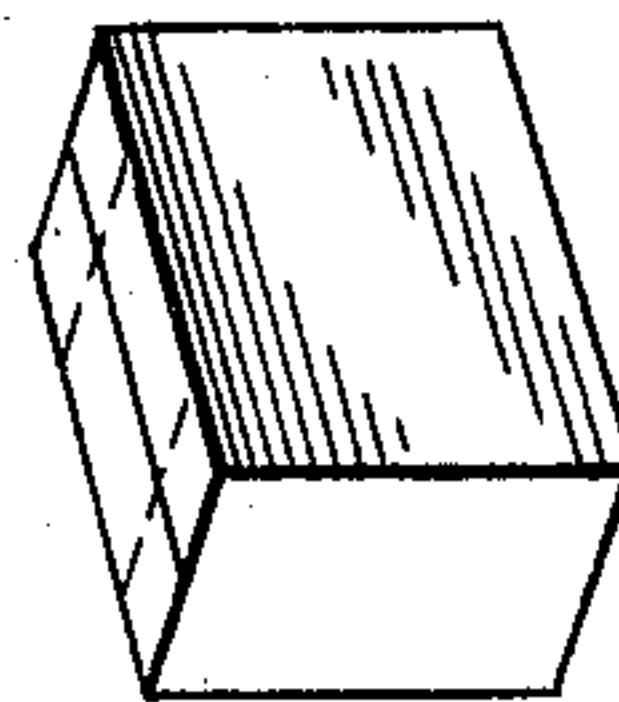
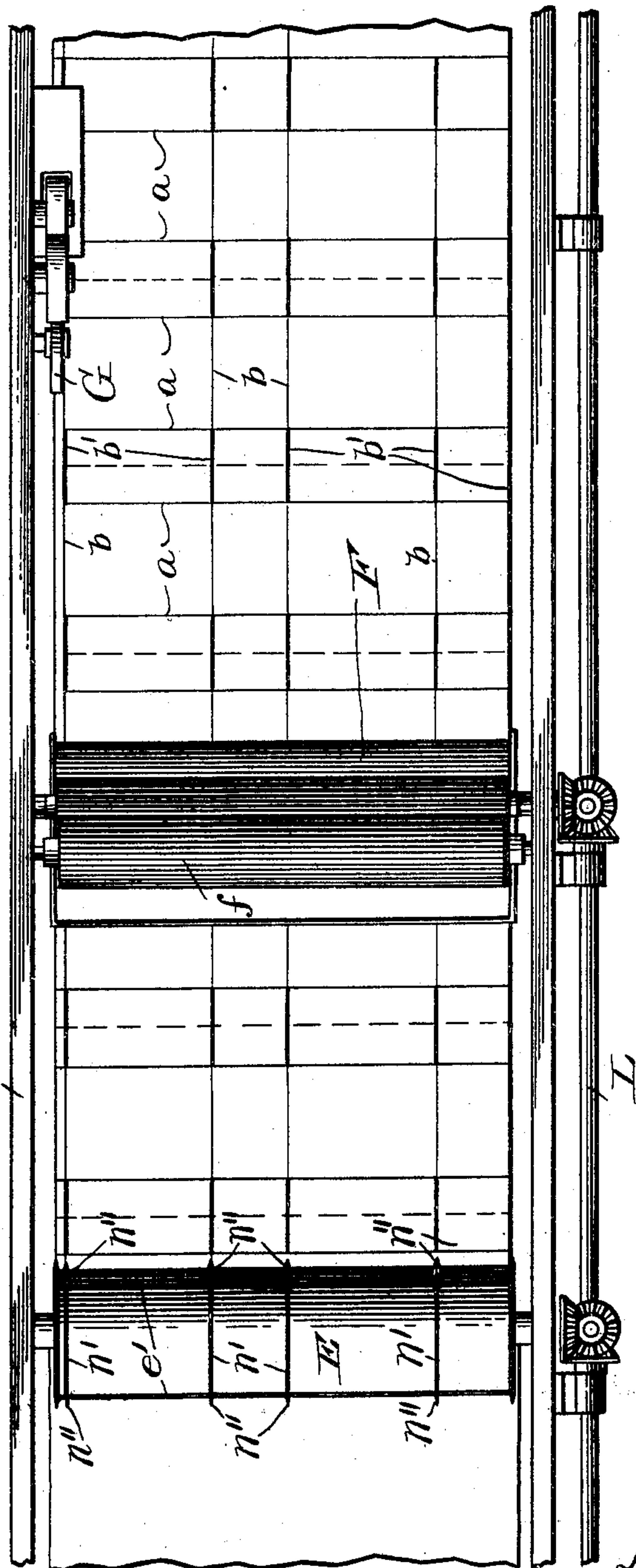


Fig. 15.

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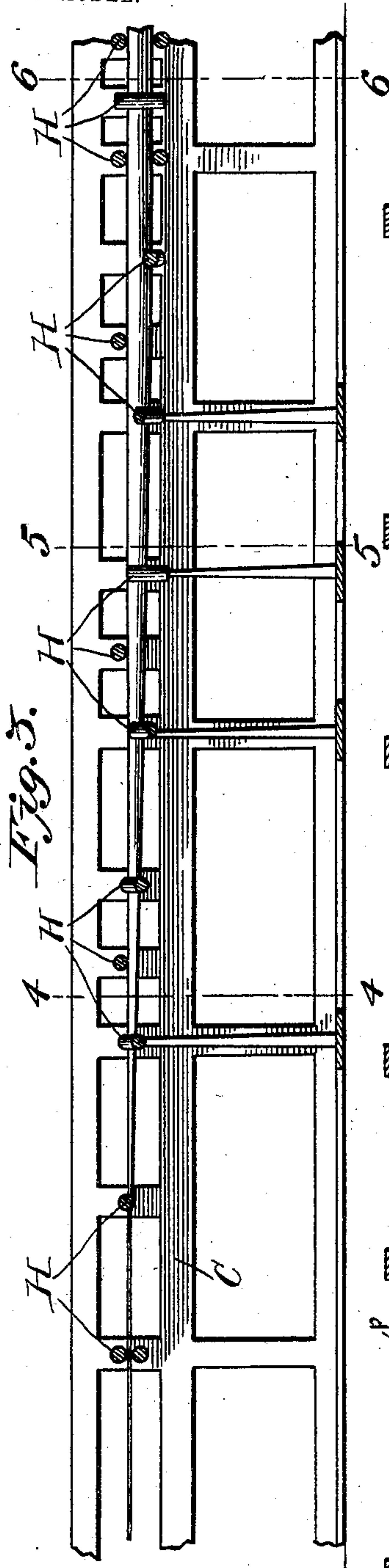
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3 SHEETS—SHEET 3.



WITNESSES:

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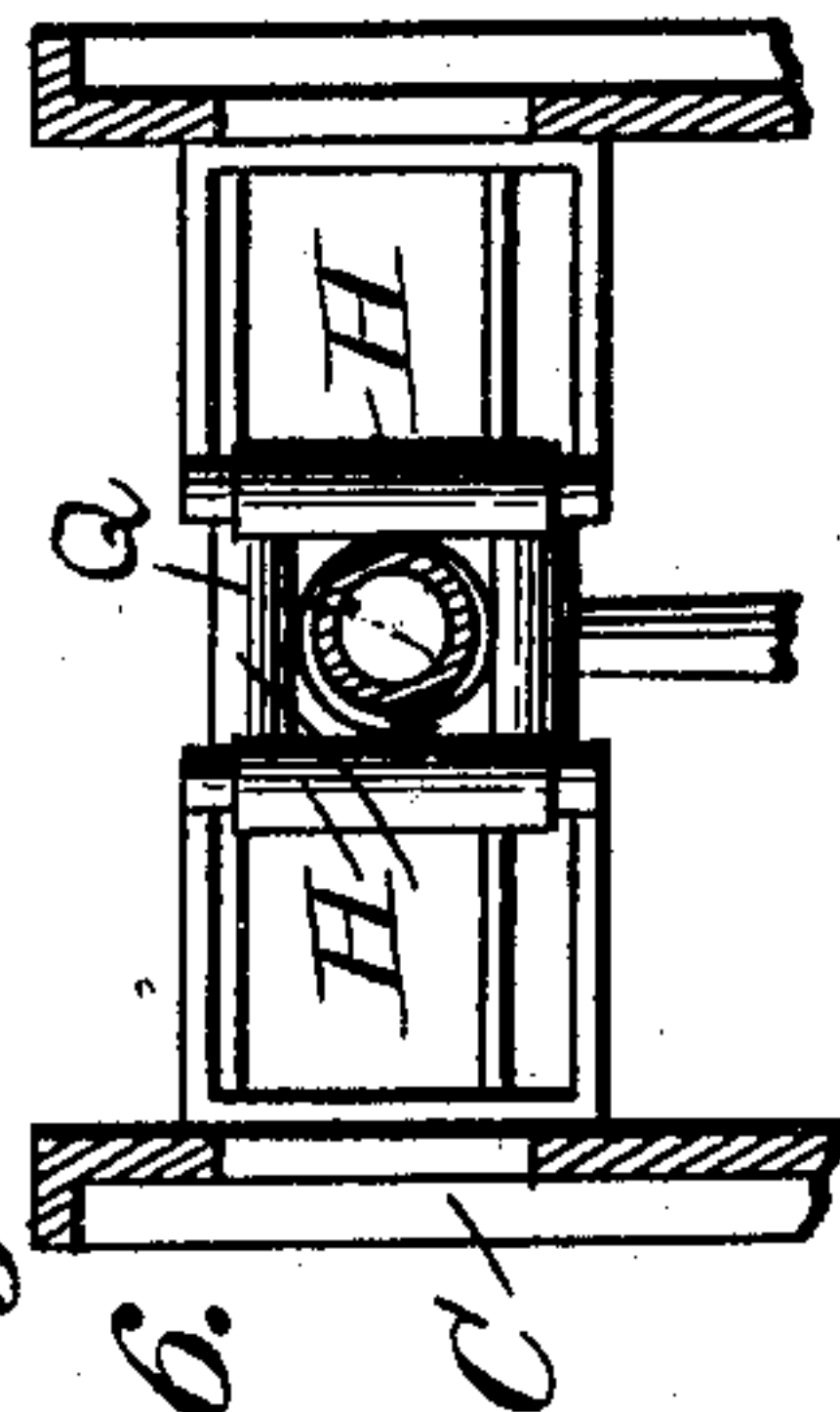


Fig. 6.

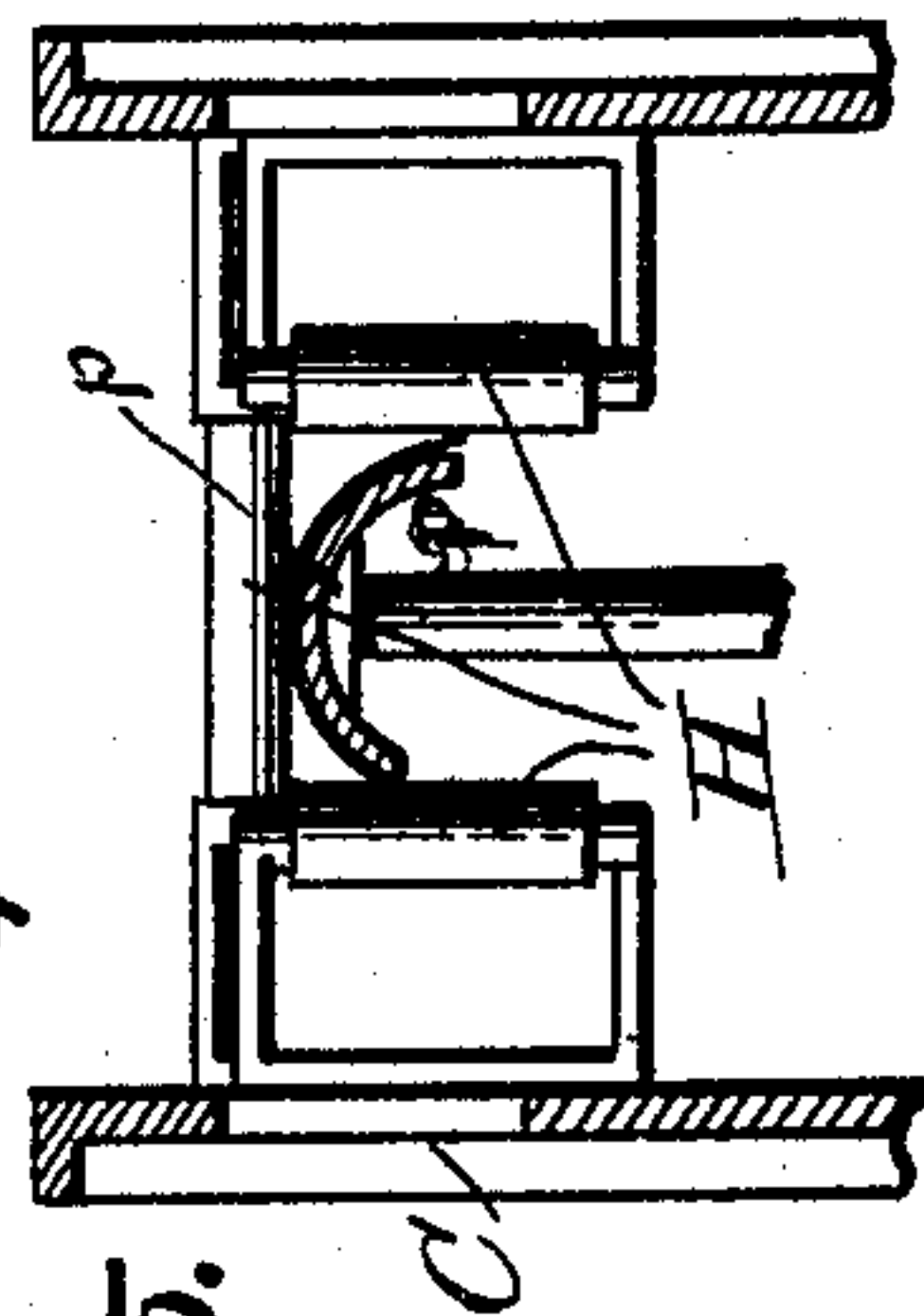


Fig. 5.

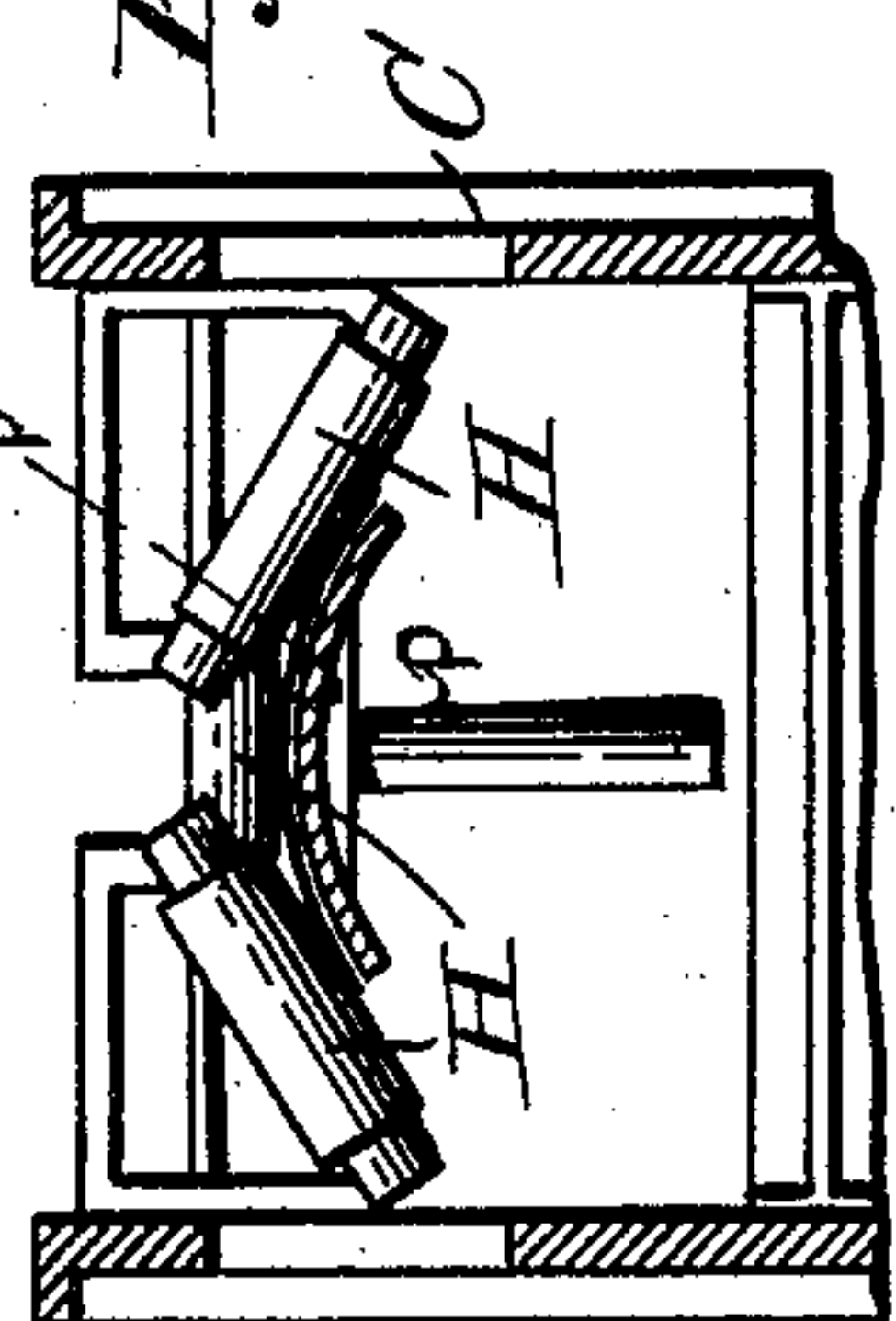


Fig. 4.

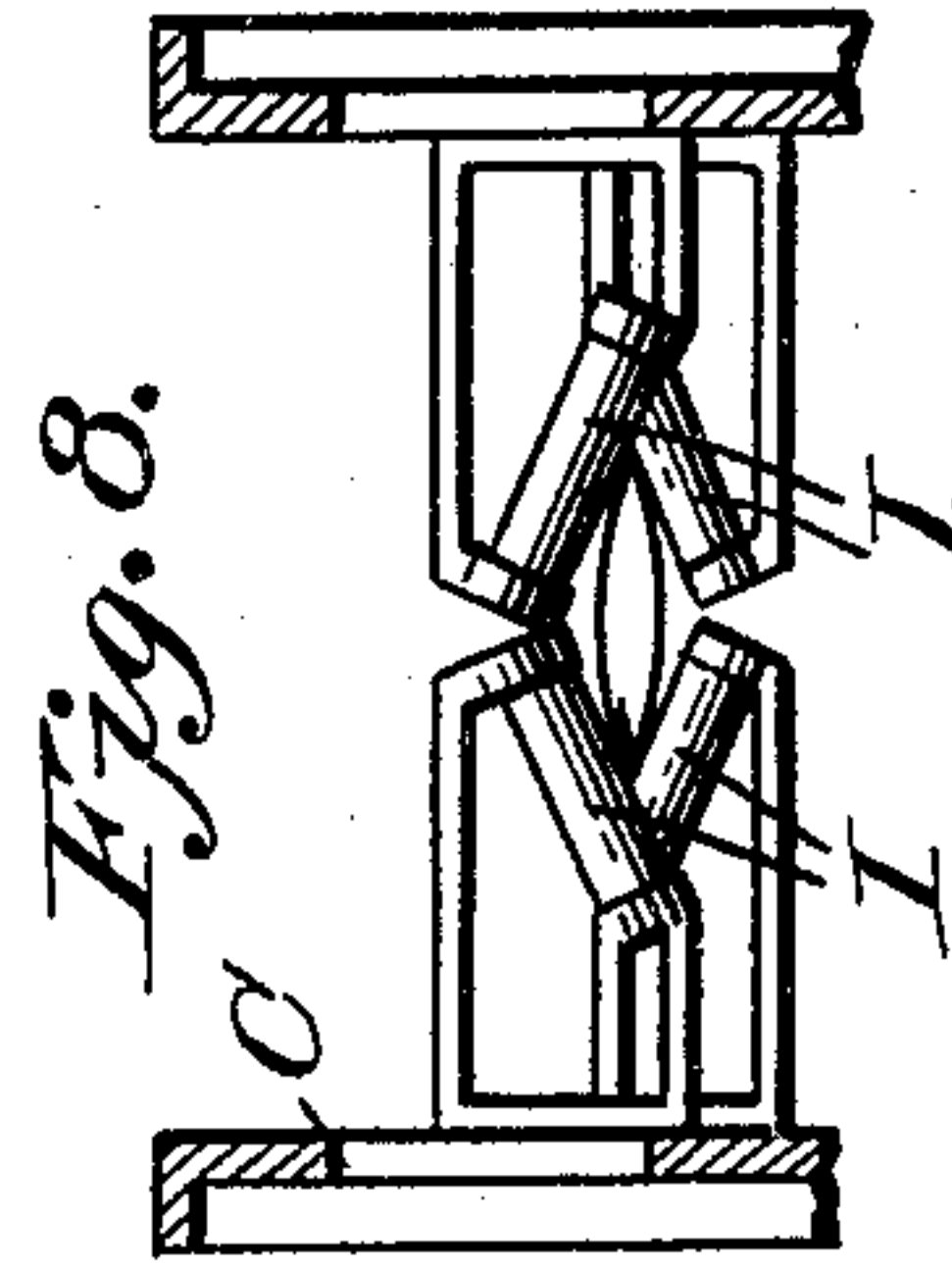


Fig. 8.

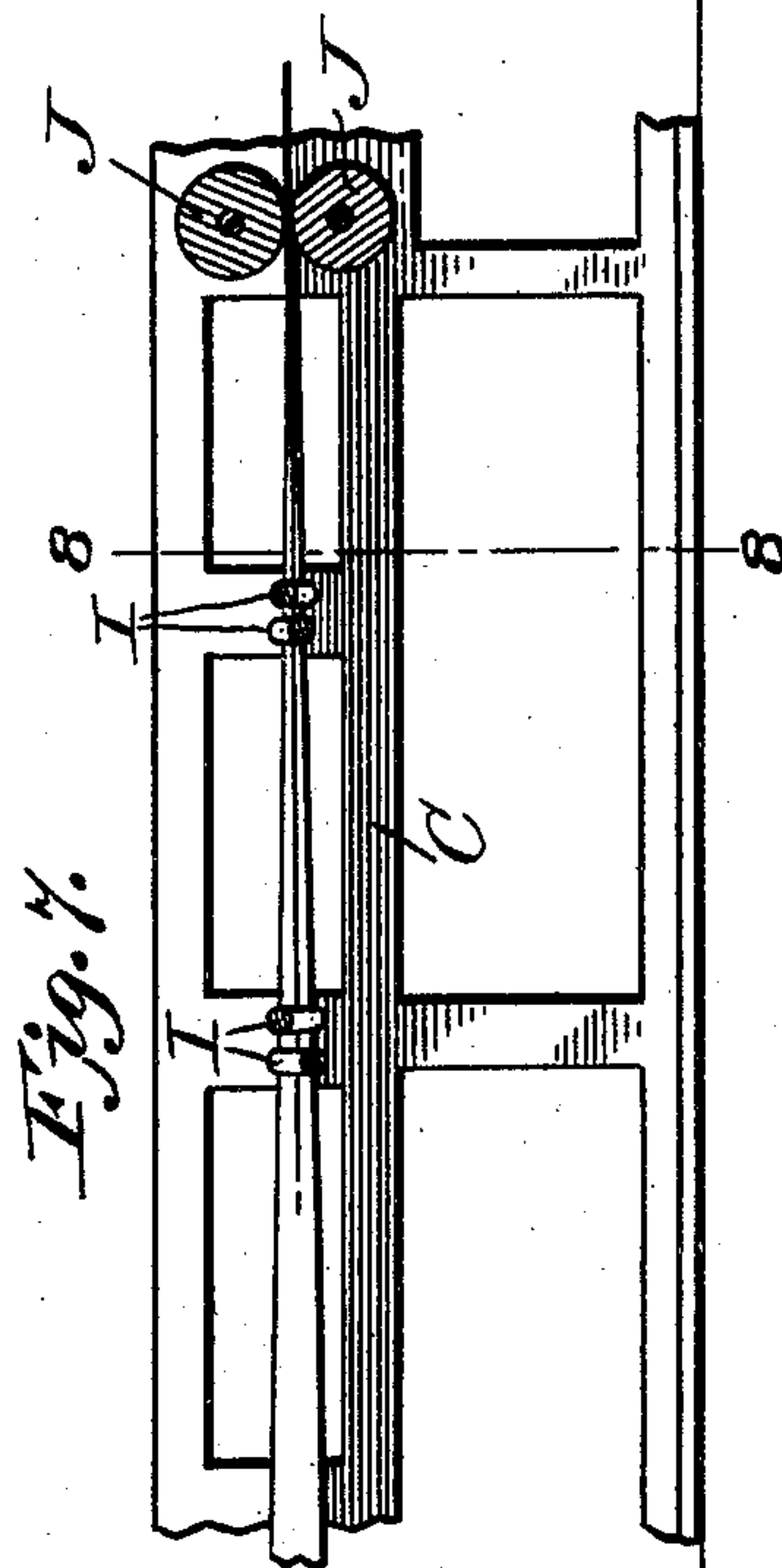


Fig. 7.

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UNITED STATES PATENT OFFICE.

LOUIS S. BURBANK, OF WORCESTER, MASSACHUSETTS, ASSIGNOR, BY
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NIAGARA FALLS, NEW YORK, A CORPORATION OF NEW YORK.

MACHINE FOR MAKING CARTONS OR FOLDING BOXES.

SPECIFICATION forming part of Letters Patent No. 770,159, dated September 13, 1904.

Application filed December 21, 1899. Serial No. 741,074. (No model.)

To all whom it may concern:

Be it known that I, LOUIS S. BURBANK, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Machines for Making
5 Cartons or Folding Boxes; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will
10 enable others skilled in the art to which it appertains to make and use the same.

In the accompanying drawings, Figure 1 is a side elevation of my machine, partly broken away. Fig. 2 is a partial plan view of same
15 on an enlarged scale. Fig. 3 is a partial vertical longitudinal section of the machine, illustrating the guiding-rollers. Figs. 4, 5, and 6 are sectional views illustrating successive steps in the folding of the paper. Figs. 7 and
20 8 are detail views illustrating the operation of the creasing-rollers. Fig. 9 is a detail sectional view of the cutting and scoring rollers. Figs. 10 and 11 are detail views illustrating the operation of the cutter. Fig. 12 is an end
25 view of the cutter, and Figs. 13, 14, and 15 are detail views of the finished carton.

This invention has relation to a machine for making cartons or folding boxes of paper; and it consists in the novel construction and combinations of devices, as hereinafter explained.
30

The object of the invention is to provide such folding cartons economically and in large quantities mainly for the use of factories and other sources of supply wherein the cartons
35 are needed for casing the goods manufactured.

The folding carton made by this machine is rectangular and of doubled flat formation, its upper and lower portions or doublings being in contact with each other, as indicated at A
40 in the drawings. Scorings are represented at *a* and *b* at right angles with each other and edge slits *b'* in line with the scorings *b*. The frame C of the machine is of elongated form and is provided with proper mountings for
45 seating the journals of the mechanism and other special parts.

D represents bearings at the end of the ma-

chine for the axis-piece of the supply-roll *d* of paper.

E E designate the scoring-rolls, which should
50 also be provided with edge-knives for trimming the edges of the paper which passes from the supply-roll between said scoring-rolls.

F F' represent the printing-rolls.

G indicates a disk whereby a line of glue or
55 paste is applied along one edge of the sheet of paper.

H H indicate a number of sets of edge guiding or folding rolls, whereby the edges of the sheet of paper are gradually guided upward,
60 around, and over toward each other until one edge overlaps the other, the sheet then having the form of a cylinder or sleeve. The overlapping edge portion of the sheet is provided with the line of glue.
65

In this machine the paper is bent over rounded guides P P, which are secured to the frame and are arranged along the median line, their curved bearing-surfaces *p* presenting upward, preferably in order that the
70 weight of the lateral portions of the strip of paper may assist in the bending. The guides P P are supplemented by the opposite isoclinal folding-rolls H H above referred to, which being arranged along the length of the strip
75 in series with their axis, having gradually-increasing angular relation to the horizontal, gradually turn its edge portions around under the middle portion until it assumes tubular form, when it is supported by a shaping-
80 mandrel Q, which fills out the tube, giving it a true cylinder form.

J represents the pressing-rolls, whereby the cylinder or sleeve is pressed flat to effect the adherence of the edge portions and to
85 bring the doublings in contact.

K K designate the rotary knives, whereby the flattened sleeve is cut into sections, each of which is designed to be a complete folding
90 carton.

The various rolls and moving parts may be operated by means of a longitudinal shaft L, having proper gear connections. The scoring-rolls are provided with corresponding

transverse indentations *e* and fine ribs *e'*, which extend between the edge-trimming cutters *m*. These rolls are also provided with the corresponding circumferential indentations *n* and fine ribs *n'*, alternating with short cutters *n''*, also extending circumferentially in such manner that in their work upon the sheet the longitudinal scorings alternate with the slits in the same lines, or the indentations may be omitted, as the ribs will score on a plain roll sufficiently well. The upper printing-roll *F* is provided with a circumferential type-face to receive ink from the small rollers of the inking apparatus *f*, and as the sheet of paper passes between the rollers *F* and *F'* the printed matter which is designed for the cartons is placed thereon. That portion of the machine along which the folding is effected through the medium of the guiding-rolls *H* is of considerable length, in order to provide a very gradual bending during the operation, this bending being such that when the edges of the sheet are brought to the lapping position their variation from parallelism will be inconsiderable. The long folding mechanism also allows time for the printing to dry. In order to insure the drying, however, a hot-air incasement may be provided over a portion of the folding mechanism. The disk *G*, whereby the line of glue or paste is applied to the edge portion of the sheet, may be located in any convenient position. If a drying-incasement is provided over the folding mechanism, it should be located beyond the incasement near the pressing-rolls *J*. Lateral creasing-rolls *I* are arranged to engage the sides of the sheet at its bent or sleeve-form portion where it approaches the pressing-rolls *J*, said creasing-rolls serving to partially flatten the tube formed by the mandrel *Q* and its supplementary rollers and start the angular bends and at the same time guiding it in the proper direction between the pressing-rolls. By these rolls the sleeve is pressed flat and the edges of the sheet are secured together along the lapped portion. As the flat sleeve portion passes along from the pressing-rolls it is subdivided into sections or cartons by the rotary spiral shearing-knives *K K*, the cuts being made transversely and through the

middle points of the longitudinal slits of the sheet. The shafts *k k* of the knives are horizontal and parallel to each other and extend transversely but somewhat obliquely over and under the work, and the edges of the cutting-blades are of corresponding spiral formation, adapting them to effect a straight shear at right angles to the line of feed and while the sleeve is in motion. The successive points of the spiral cutting edges as they come together in making the section are in exact transverse position. The cutters are mounted on oblique shafts, in order that the tendency of their spiral formation to move the work laterally askew will be corrected. The cutter-blades are set with their cutting edges presenting radially outward and are designed to act radially upon the work between them. The sections or cartons as they are cut off may be stacked at *V*.

Having described this invention, what I claim, and desire to secure by Letters Patent, is—

1. In a machine for making cartons, the combination with scoring, trimming and tube-forming rolls, of pressing-rolls, a lower rotary shaft oblique to the line of feed, an upper rotary shaft parallel to said lower rotary shaft, and corresponding oppositely-inclined spiral blades on these shafts, adapted to effect a straight shear cut at right angles to the line of feed, substantially as specified.

2. In a machine for making cartons from a continuous strip of paper, the combination with scoring and trimming rolls, and pasting devices at one end, of pressing-rolls, oblique shafts and their oppositely-inclined spiral cutters at the other end, and below the pasting devices and pressing-rolls, supports for the middle portion of the strip of paper, and opposite isoclinal guide-rolls, whereby it is bent downward, folded under in tubular form, creased, pressed, and cut off in sections, substantially as specified.

In testimony whereof I affix my signature in presence of two witnesses.

LOUIS S. BURBANK.

Witnesses:

ALBERT H. CHAFFEE,
J. R. GILKERSON.