

(No Model.)

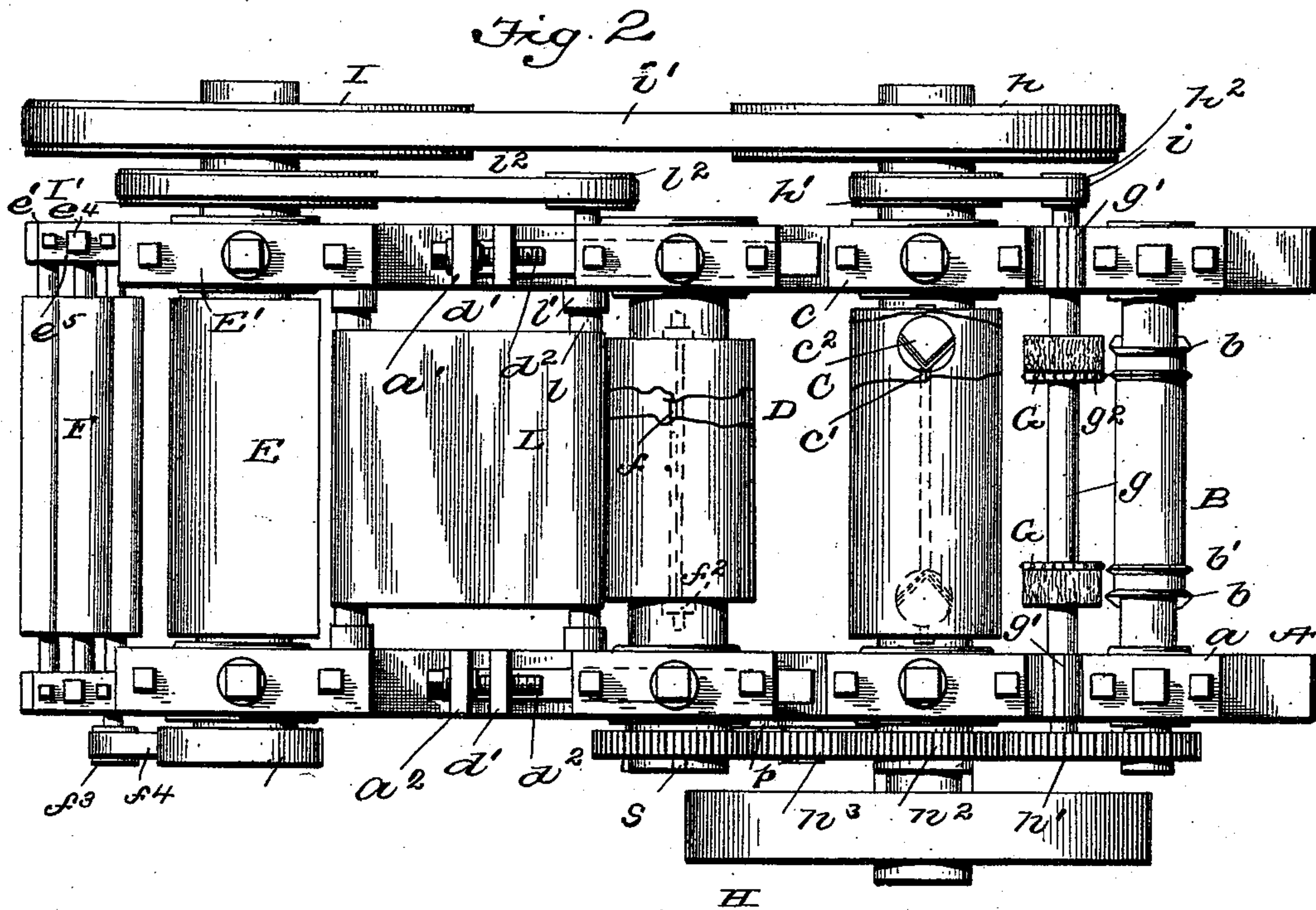
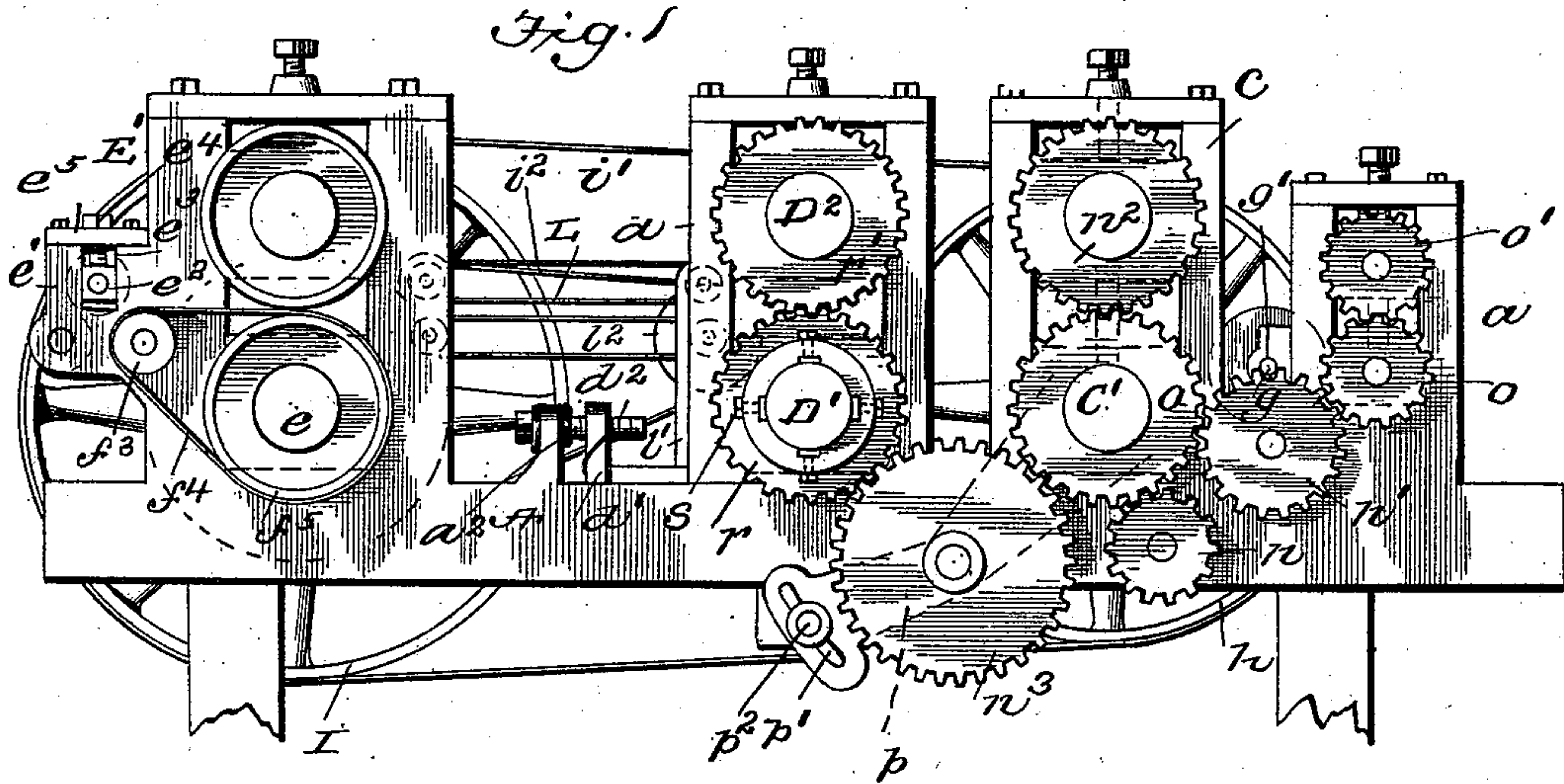
2 Sheets—Sheet 1.

C. E. CLEMENT.

MACHINE FOR MAKING BLANKS FOR PAPER BOXES.

No. 541,720.

Patented June 25, 1895.



Witnesses

John Smilie  
W. Harry Muzzey

Inventors  
Charles E. Clement  
By  
Norman Emrick Lawrence  
Attorneys

(No Model.)

2 Sheets—Sheet 2.

C. E. CLEMENT.

MACHINE FOR MAKING BLANKS FOR PAPER BOXES.

No. 541,720.

Patented June 25, 1895.

Fig. 3

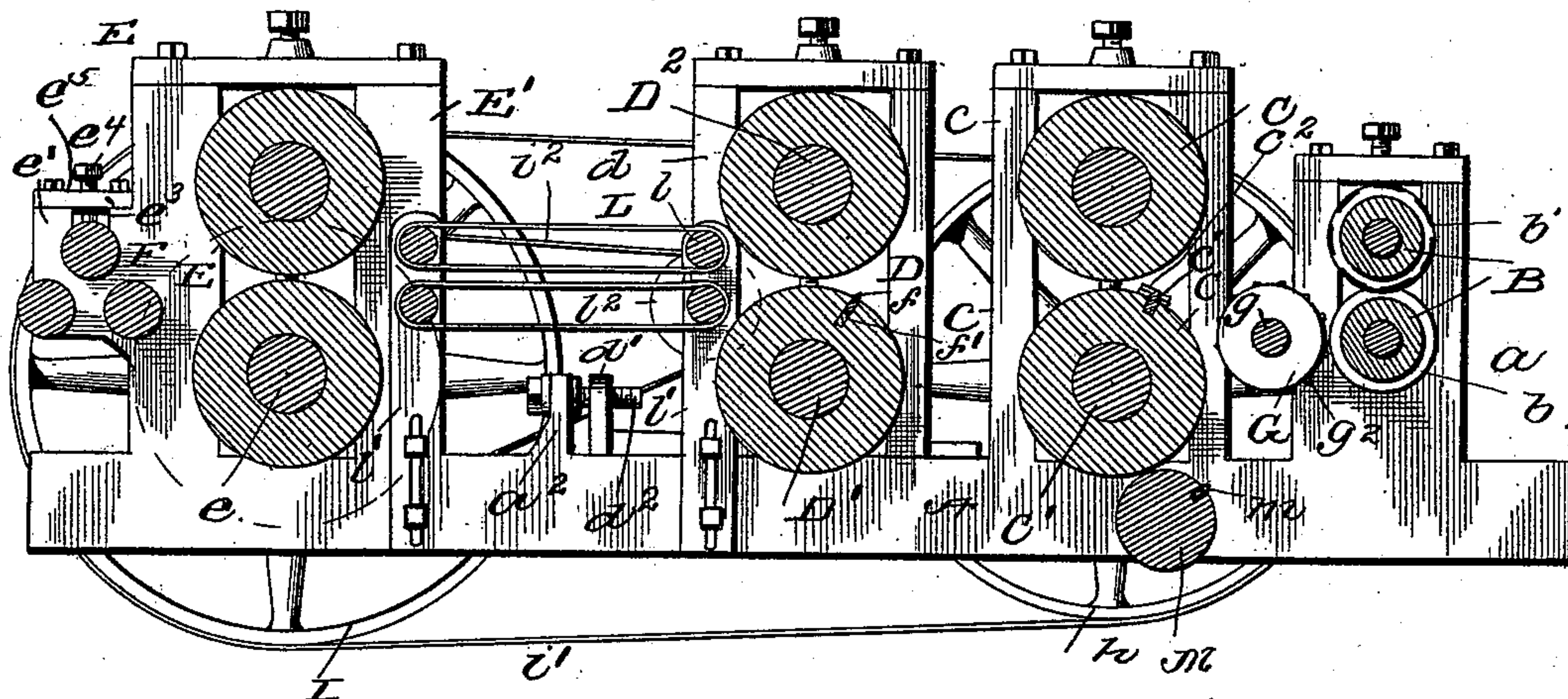


Fig. 4

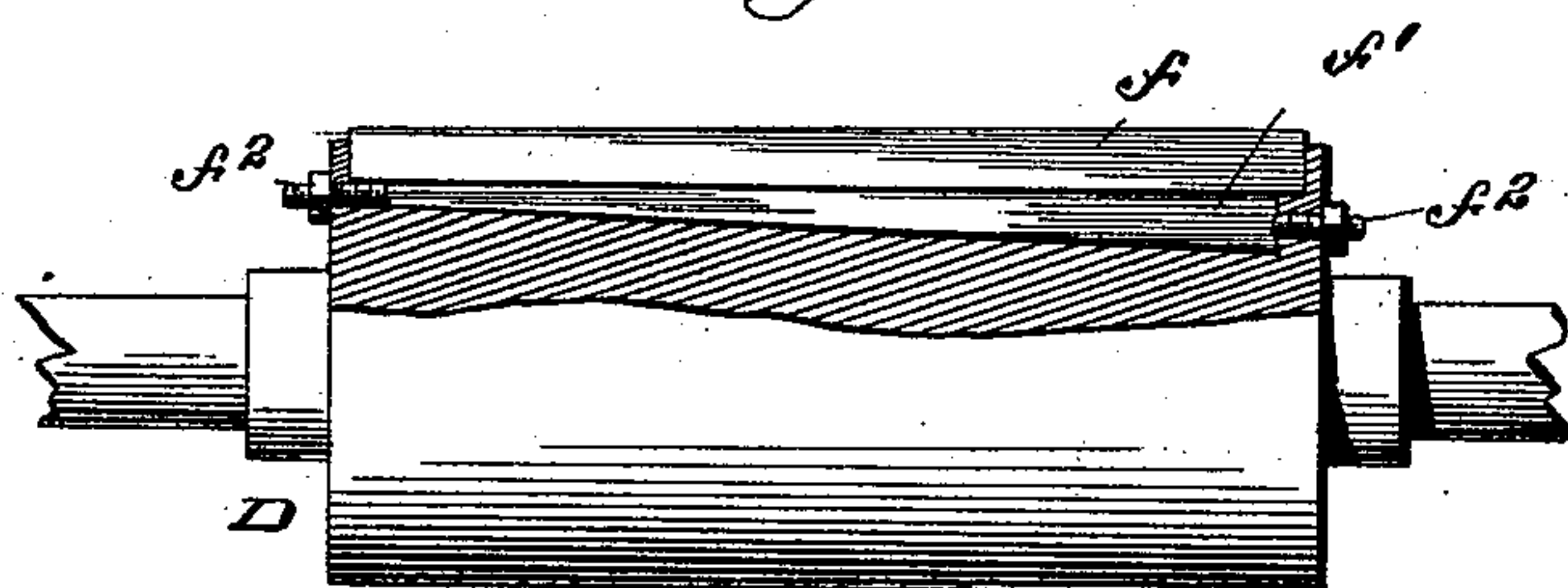


Fig. 6

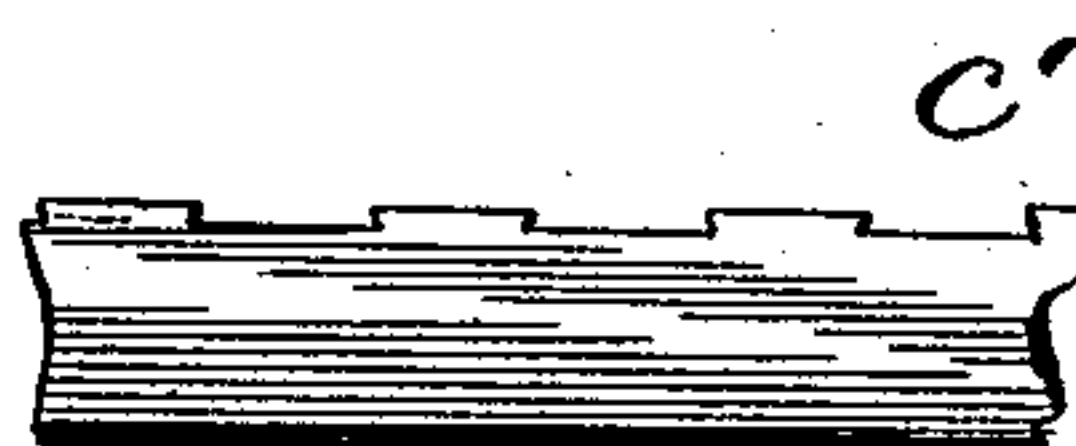


Fig. 7

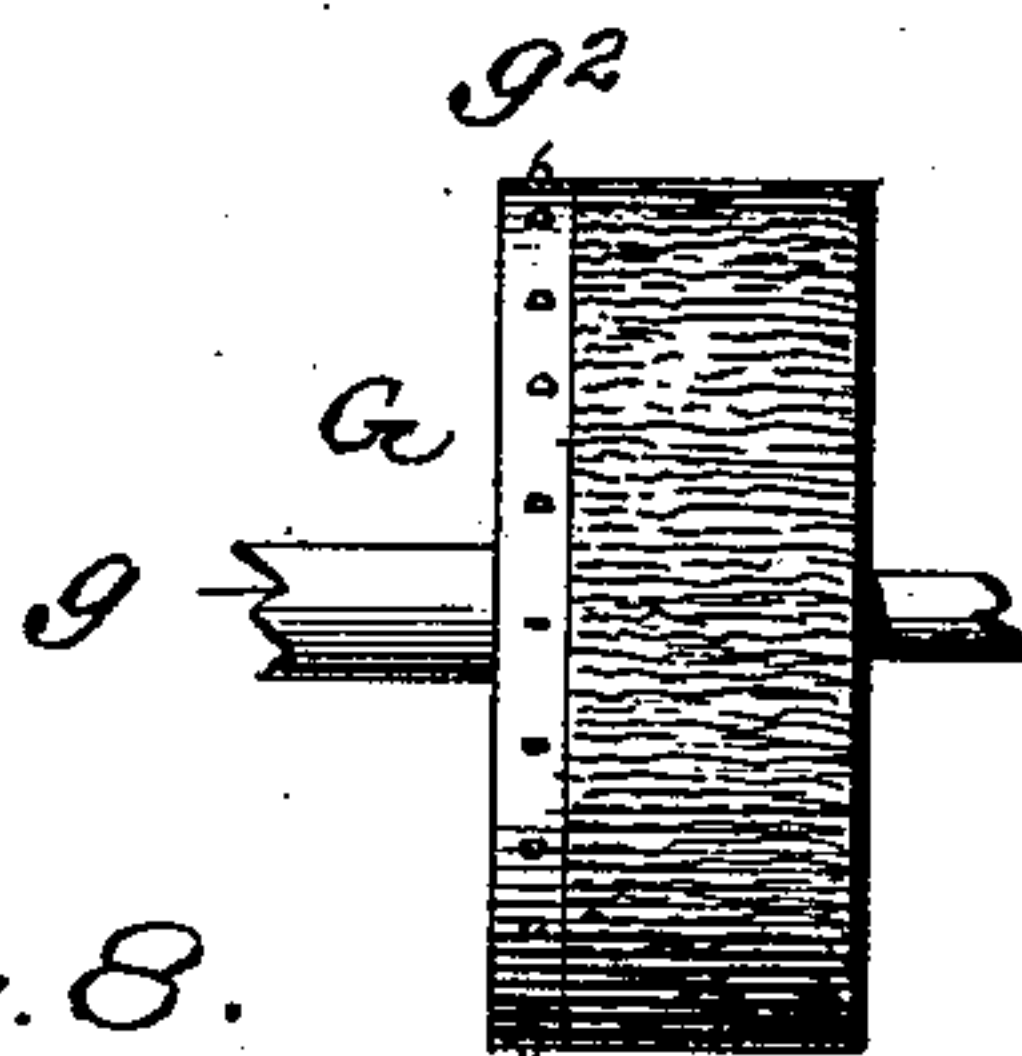


Fig. 5

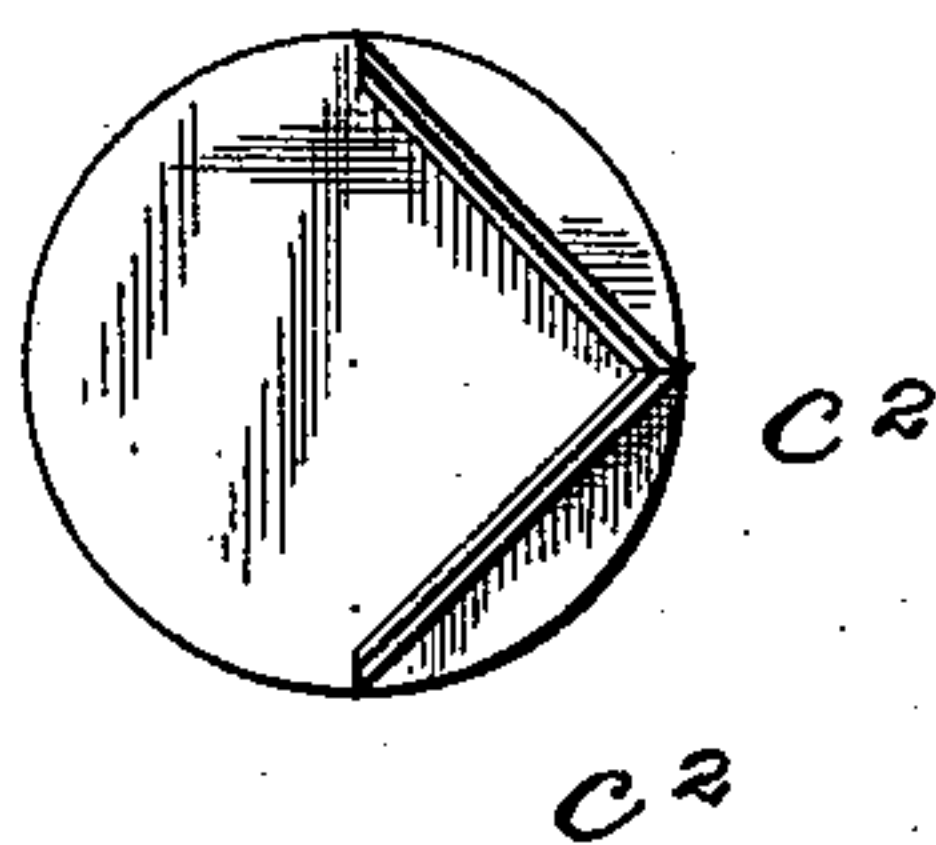
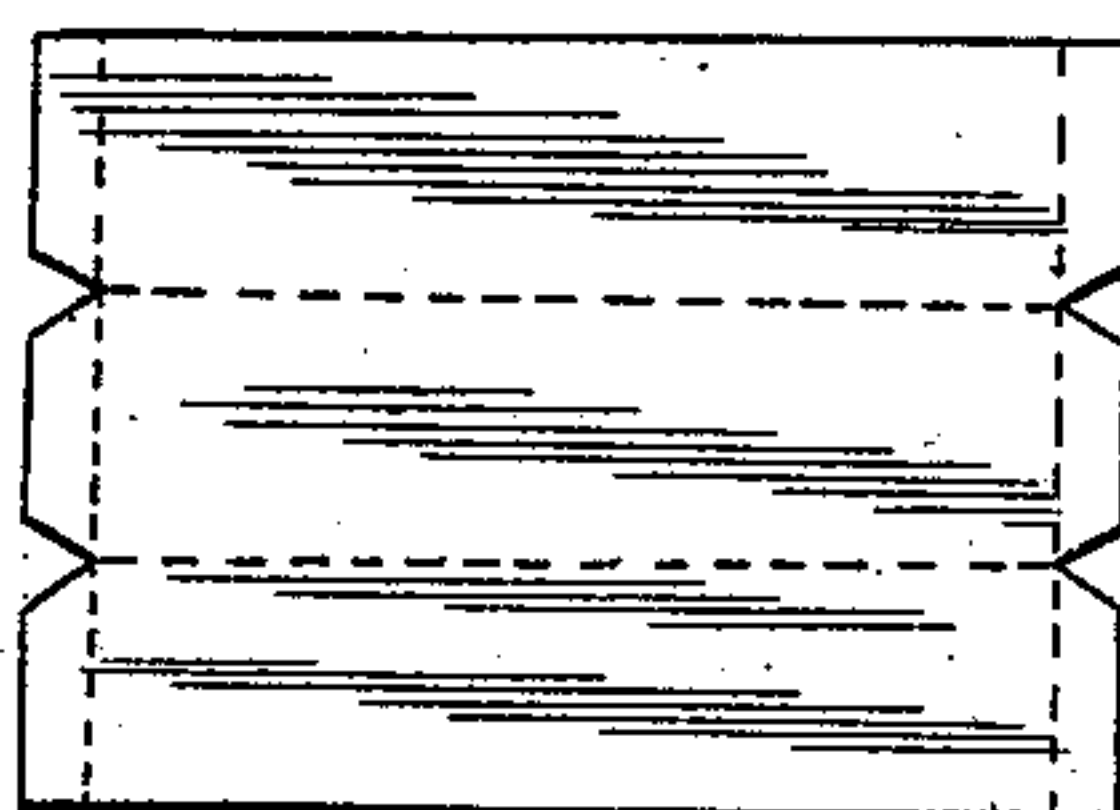


Fig. 8



Witnesses

John I. Innie  
W. Harry Muzzey

Inventors  
Charles E. Clement  
Maurice  
Hammer

Attorneys



# UNITED STATES PATENT OFFICE.

CHARLES E. CLEMENT, OF NASHUA, NEW HAMPSHIRE.

## MACHINE FOR MAKING BLANKS FOR PAPER BOXES.

SPECIFICATION forming part of Letters Patent No. 541,720, dated June 25, 1895.

Application filed July 2, 1894. Serial No. 516,353. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES E. CLEMENT, a citizen of the United States, residing at Nashua, in the county of Hillsborough and State of New Hampshire, have invented certain new and useful Improvements in Machines for Making Blanks for Paper Boxes; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to machines for trimming, scoring, notching and embossing straw board material, or the like, for blanks for making boxes and it consists of the combination of a pair of improved edge trimming and longitudinally scoring rolls, of improved laterally scoring and notching rolls, cutting rolls adjustable in relation to said last mentioned rolls and means for actuating all of said rolls.

It also consists of the combination with improved edge trimming and longitudinally scoring rolls, of improved laterally scoring and notching rolls, cutting rolls, embossing rolls, means for transferring the blanks from the cutting to the embossing rolls, and means for actuating said rolls.

It also consists in the combination with edge trimming and longitudinally scoring rolls, of rasping or surface roughening rolls, laterally scoring and notching rolls, cutting rolls adjustably mounted in relation to the last mentioned rolls, embossing rolls, means for transferring the blanks from the cutting to the embossing rolls, straightening rolls receiving the blanks from the embossing rolls and means for actuating said rolls and permitting the cutting rolls to be moved in relation to the scoring rolls.

It also consists in certain other novel constructions, combinations and arrangements of parts as will be hereinafter more fully set forth and claimed.

In the accompanying drawings, Figure 1 represents a side elevation of the devices embodying my invention. Fig. 2 is a top plan view of the same. Fig. 3 represents a longitudinal central vertical section through said devices. Fig. 4 represents a detail side elevation, partly in section, of the cutting-roll, showing the wedge for adjusting the cutting-

blade. Fig. 5 represents a detail top plan view and side elevation of the V-shaped knife and its supporting-block for cutting the notches. Fig. 6 represents a detail side elevation of one of the scoring-knives. Fig. 7 represents a detail side elevation of one of the rasping-rolls; and Fig. 8 is a plan view of a finished box-blank as cut, roughened, and scored by my machine.

A in the drawings is the frame of the machine; B, the scoring and trimming rolls; C, the notching and scoring rolls; D, the cutting rolls; E, the embossing rolls, and F the straightening rolls.

The rolls B, B are mounted in standards *a* of the frame and are provided with angular trimming knives *b* and scoring knives *b'*; said knives trimming the edges and scoring the web of the straw board longitudinally as it is fed between them, and the scoring knives having notched edges whereby the board is scored without materially weakening it. The straw board is fed from the rolls B onto rasping rolls G, G, mounted on a shaft *g* having its ends mounted in bearings *g'* on the frame and thus the portion of the box blank between the longitudinal scores and the edges of the blank will be roughened or rasped so that the paste will readily take hold when the box is put together. The rasping rolls are also provided with scoring projections *g<sup>2</sup>*, see Fig. 7, which enter the scores made by the scoring knives *b'* and enlarge or complete the same.

The scoring or notching rolls C are mounted in the standards *c* of the main frame. The lower roller C is provided with a transversely arranged scoring knife *c'*, having a notched edge as shown in Fig. 6, and V-shaped notching knives *c<sup>2</sup>*; said knives being mounted on blocks which are set in recesses in said roll and are adapted to cut the straw board as it passes over said knives and between the rolls. The shaft C' which carries the roller C is provided with a power belt wheel H at one end and two connecting belt wheels *h*, *h'* at its opposite end, the wheel *h'* being connected by a belt *i* to a belt wheel *h<sup>2</sup>* on the shaft *g* and the belt wheel *h* being connected by belt *i'* to the belt wheel I mounted on the shaft *e* of the lower embossing roll E.

The cutting rolls D, D are supported in standards *d* which are adjustably mounted on



the frame A by means of the angular arms  $d'$  which are adapted to be engaged by bolts  $d^2$  mounted in lugs  $a^2$  of the frame, by suitable locking nuts. The lower roll D is provided with the cutting knife  $f$ , see Fig. 4, which is set in a longitudinal slot in the periphery of said roll and is adjustable in or out by means of a wedge or inclined slide  $f'$  mounted on the inclined bottom of said slot and moved longitudinally by means of set screws  $f^2$ . By this wedge the knife is fully supported at all points along its length and at the same time can be readily adjusted in or out by simply loosening the screws  $f^2$  and moving the wedge up or down the bottom of the inclined slot.

Endless belts L passing about rollers  $l$ , which are mounted in standards  $l'$  attached to the frame, receive the straw board from the cutting rolls and convey it to the embossing rolls E. One of the rollers  $l$  carries a belt wheel  $l^2$  which is connected by a belt  $i^2$  with the belt wheel  $I'$  on the shaft  $e$ .

The embossing rolls E are mounted in standards  $E'$  of the frame and are provided upon their peripheries with any suitable configurations which are to be embossed upon the straw board as it passes between them. The standards  $E'$  are provided with brackets  $e'$  in which are journaled the shafts of a nest of straightening rolls F. These rolls are preferably three in number, two at the bottom and one above and in a vertical plane between the two lower rolls. The upper roll has its shaft mounted in blocks  $e^2$  which are adapted to be adjusted in vertical slots  $e^3$  by means of screws  $e^4$  which bear on a cap plate  $e^5$  of said slots and thus the distance between the upper roller and the two lower rollers can be regulated to suit the thickness of the straw board to be used.

One of the lower rollers F is provided with a belt wheel  $f^3$  which is connected by a belt  $f^4$  with a belt wheel  $f^5$  mounted on the shaft  $e$  and thus said nest of rollers is operated to feed the cut blanks between them and remove the curvature from the same.

An auxiliary cutting roller M provided with a cutting blade  $m$  is mounted in the frame below the rolls C, C and is adapted to receive the strips cut from the edges of the straw board by the trimming rolls B, B, and cut them into short lengths so that they will not be carried into the machine and become tangled in the same.

The upper rolls, B, C, D, and E are adjustable vertically in their respective standards, by adjusting screws mounted in said standards and engaging the bearings of said rolls.

The rolls B, D and M are connected to the power shaft C by gearing. This gearing consists of a gear wheel O mounted on the shaft  $C'$  and meshing with a gear  $n$  of the roller M, also with a loose pulley  $n'$ , a gear  $n^2$  on the shaft of the upper roll C and a gear  $n^3$  mounted on an arm  $p$  which is pivoted at one end to shaft  $C'$  and is provided at the other end with

a slotted head  $p'$  which is secured to a projection of the frame A by a bolt  $p^2$  which passes through the slot of said head. The gear  $n^3$  meshes with a gear  $r$  mounted on the shaft  $D'$  of the lower roll D. Said gear  $r$  is adjustably connected to the shaft  $D'$  by means of bolts  $s$  which pass through the hub of said gear and engage said shaft. The gear  $r$  meshes with the gear  $r'$  mounted upon the upper roll shaft  $D^2$ . The gear  $n'$  meshes with a gear  $o$  on the shaft of the lower roll B and this gear  $o$  in turn meshes with a gear  $o'$  on the shaft of the upper roll B.

When it is desired to move the cutting rolls D nearer to the rolls C the bolts  $p^2$  and  $s$  are loosened and the screw  $d^2$  is turned thus causing the standards  $d$  to move forward or backward.

The scoring blades and cutters on the rolls C and D must always occupy the same relative position to each other in order that each blank will be the same length and scored alike. To accomplish this it is necessary in moving the standards  $d$  that the gear  $r$  should turn on its shaft and that the gear  $n^3$  should be pushed downward. This is permitted by the loosening of the said screws  $p^2$  and  $s$  as above described. After the adjustment is made the bolts or screws are again tightened.

A belt from any suitable source of power is connected to the belt wheel H and all the rolls operated through their respective gears and belts.

The operation of the machine is as follows: The straw board is fed in between the rolls B, B in the form of a continuous web. These rolls B, B trim off the ragged edges and at the same time score the board longitudinally near its edges to form the paste flaps of the box. The board after passing from the rolls B is engaged by the rasping rolls G and the paste flaps thereof are thereby roughened so that the paste will take hold of them when the box is put together. The board then enters the scoring and notching rolls and is scored across its width and has its edges at the termini of said score, notched with the V shaped notching knife, so that similar shaped notches are formed therein. The web of board passes from the rolls C to the cutting rolls D and the knife  $f$  cuts said web into the desired length of blanks. The cut blanks are delivered from the rolls D between the endless belts L, L and are carried forward by the said belts to the embossing rolls E where they receive the desired embossment or fancy decorative impression. The blanks after leaving the embossing rolls are caught by and drawn through the nest of straightening rolls and thereby all curvature imparted to said blanks from passing through the rolls B, C, D, and E is removed and the blanks lie perfectly flat ready to be bent into the desired shape and secured together by gluing or pasting.

The material employed for forming the blanks may be any kind of board, but pref-



erably I adopt straw board, lined or faced with white paper and its width is about one-half inch greater than the blanks which are to be formed from it.

5 I find that the construction of scoring knife shown in Fig. 6, with the notched edge is preferable to a knife with a smooth edge as it scores deep enough to permit the board to be readily bent but at the same time permits  
10 sufficient of the board at the point of scoring to remain unscored to any great extent and thus preserves more perfectly the strength at this point where strength is most required.

What I claim as my invention is—

15 1. In a machine for making paper box blanks, the combination with a pair of trimming and longitudinally scoring rolls of a pair of rasping rolls for roughening the pasting edges of the blanks being cut, a pair of later-  
20 ally scoring and notching rolls, a pair of embossing rolls, means for conveying the blanks from the cutting to the embossing rolls, and means for straightening said blanks, substantially as described.

25 2. In a machine for making paper box blanks the combination of trimming and scoring rolls, roughening rolls, notching rolls, cutting rolls, embossing rolls and straightening rolls; the knives of the scoring rolls being  
30 provided with notched edges, substantially as and for the purpose described.

3. In a machine for making paper box blanks the combination of trimming and scoring rolls, rasping or roughening rolls provided  
35 with scoring projections, a cutting roll for severing the waste strips trimmed from the blanks into comparatively short pieces.

4. In a machine for making paper box blanks, the combination, of trimming and scor-  
40 ing rolls, rasping or roughening rolls, laterally scoring and notching rolls, cutting rolls adjustable in relation to the scoring and notch-

ing rolls, embossing rolls, a nest of straightening rolls, means for adjusting each pair of rolls and the nest of straightening rolls, gears  
45 connecting the scoring, notching and cutting rolls and so mounted as to permit the movement of said rolls toward or from each other, substantially as described.

5. In a machine for making paper box  
50 blanks the combination with scoring and notching rolls of cutting rolls adjustable in relation to the scoring and notching rolls, gears mounted on the shafts of the scoring and notching, and cutting rolls, the gear on  
55 the cutting roll being adjustable on its shaft, a pivoted adjustable arm carrying a gear which is adapted to engage both of the gears on the cutting and notching rolls but may be disengaged therefrom when said rolls are  
60 moved from or toward each other so that the operating blades on each may be so located as to operate at the same time, substantially as described.

6. In a machine for making paper box  
65 blanks, the combination of trimming, scoring, notching and cutting rolls, and rasping rolls for roughening the pasting edges of the blanks being cut, substantially as described.

7. In a machine for making paper box  
70 blanks, the combination of trimming, scoring and notching rolls, of a cutting roll adjustable in relation to the scoring and notching rolls and means for keeping the working parts of the scoring and cutting rolls in the same  
75 relative position to each other when they are being adjusted, substantially as described.

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

CHARLES E. CLEMENT.

Witnesses:

EDWARD H. WASON,  
WILLIAM A. JEWELL.