

(No Model.)

3 Sheets—Sheet 1.

L. J. EVEREST.

MACHINE FOR CUTTING SHEET METAL.

No. 352,683.

Patented Nov. 16, 1886.

Fig. 1.

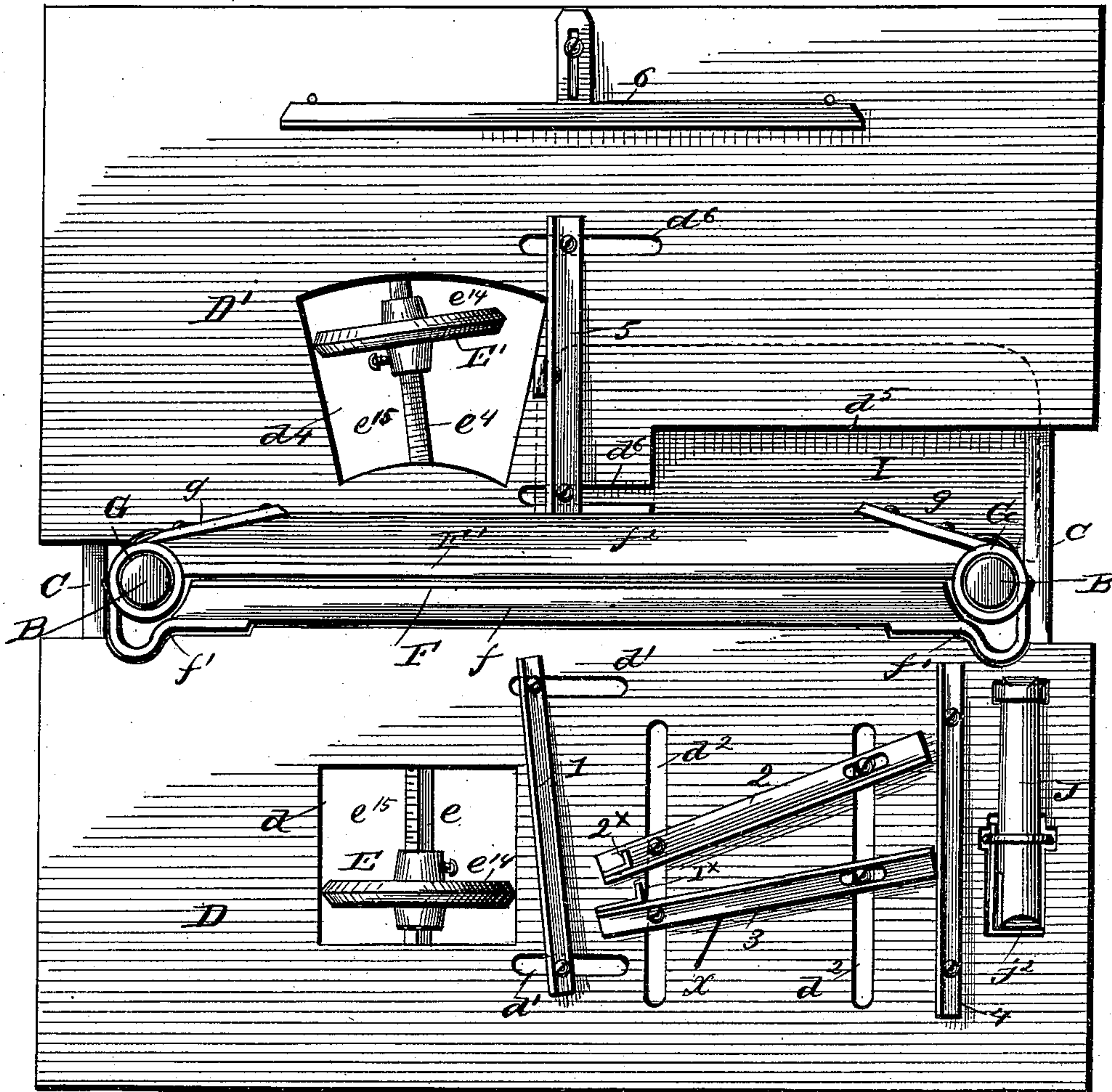
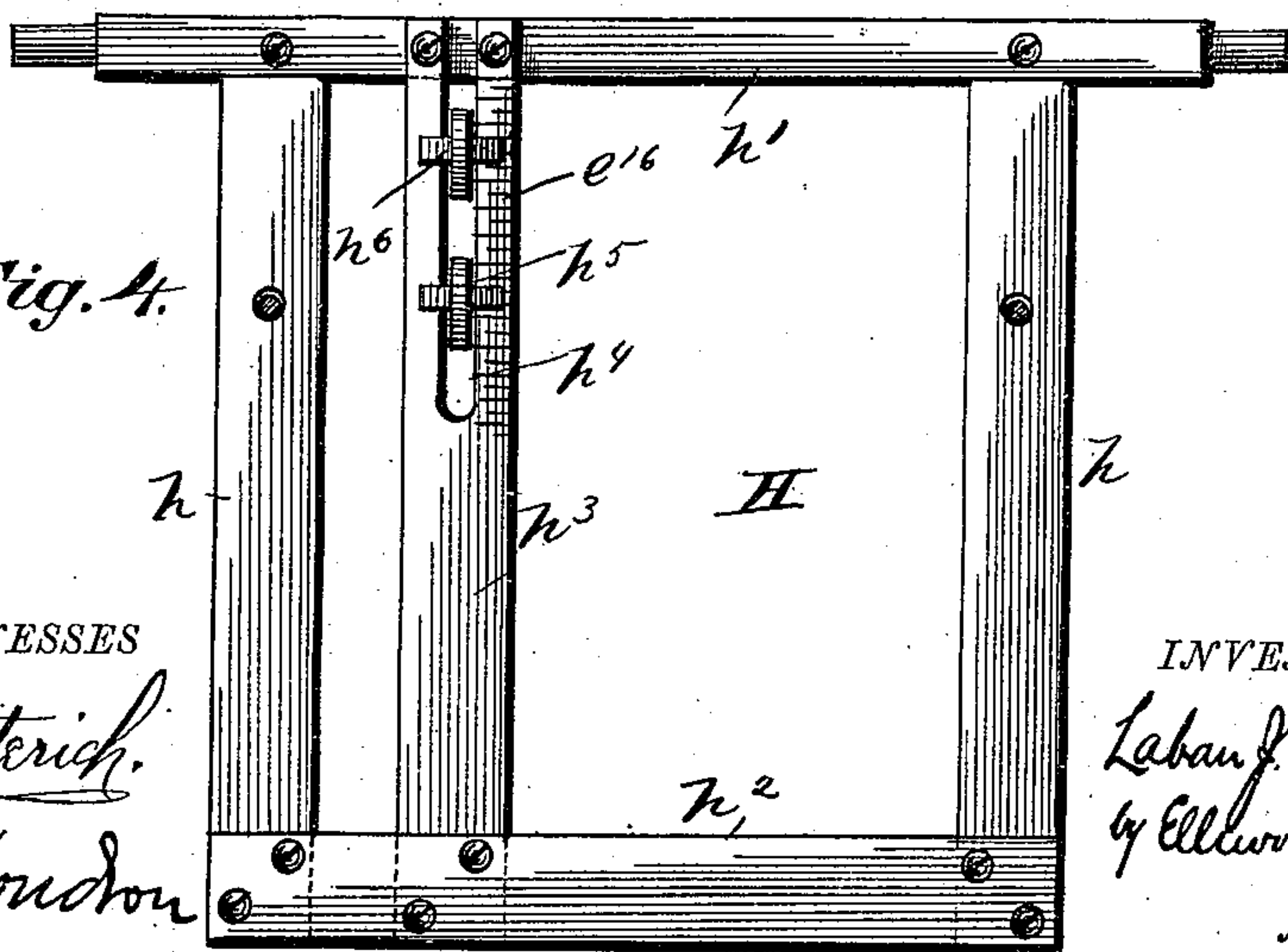


Fig. 4.



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Fig. 2.

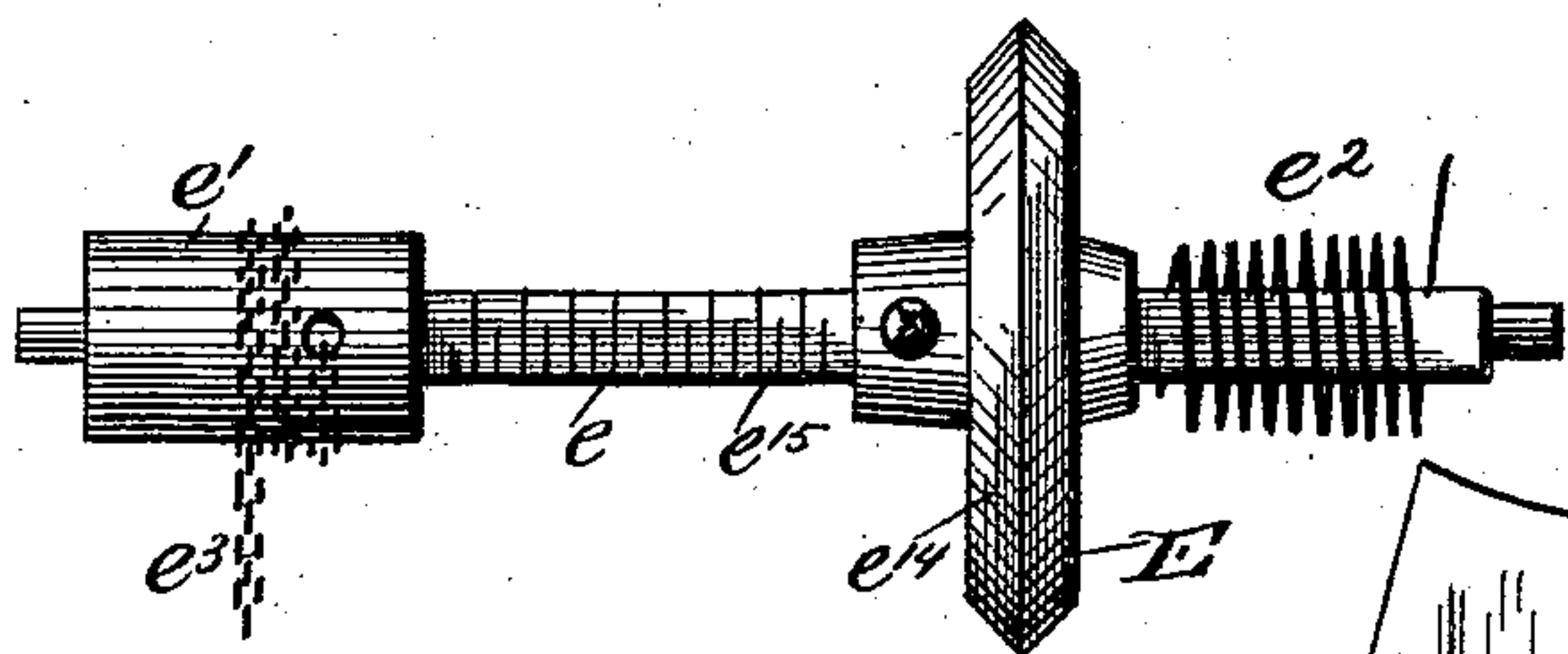
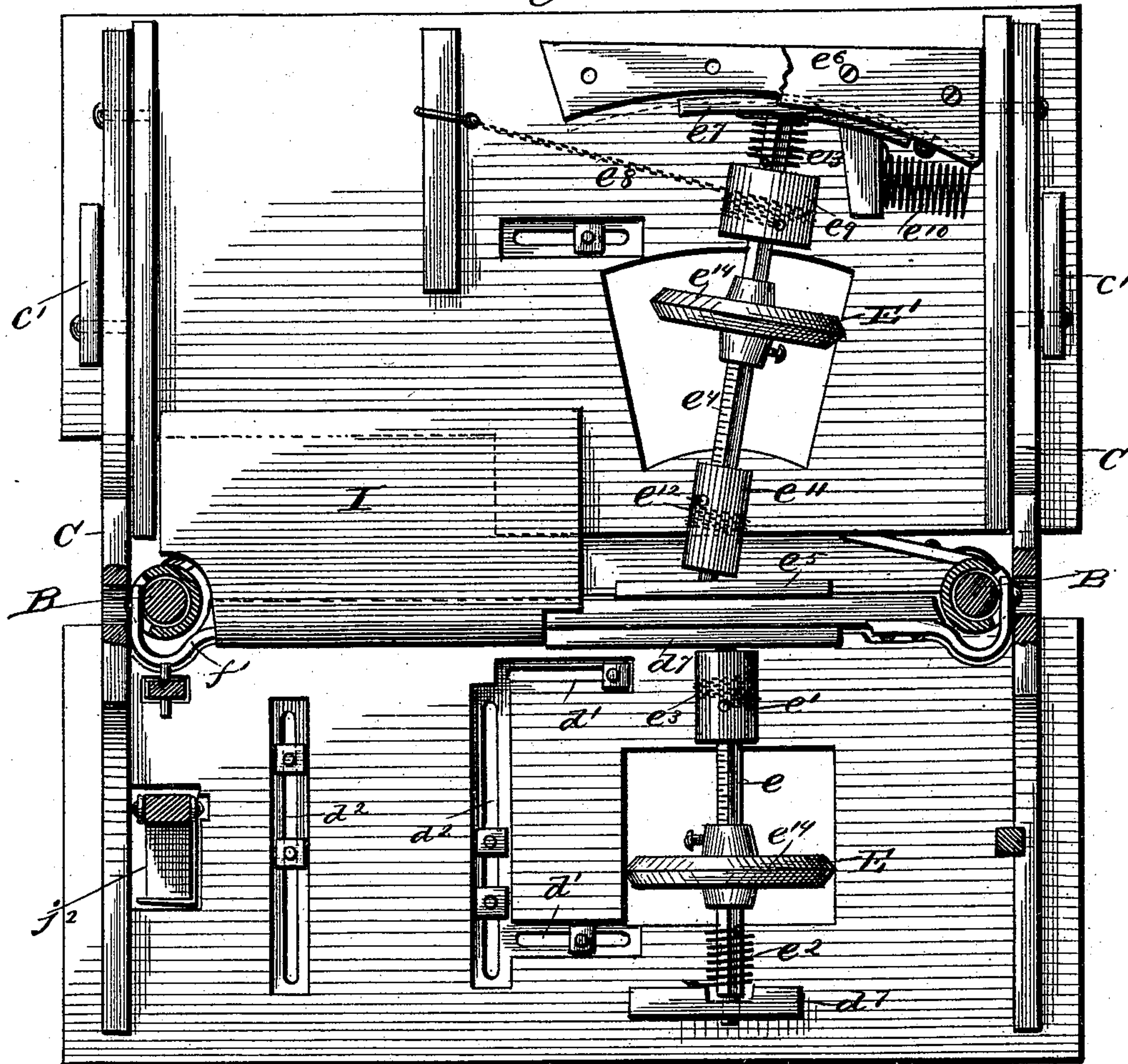


Fig. 5.

Fig. 6.

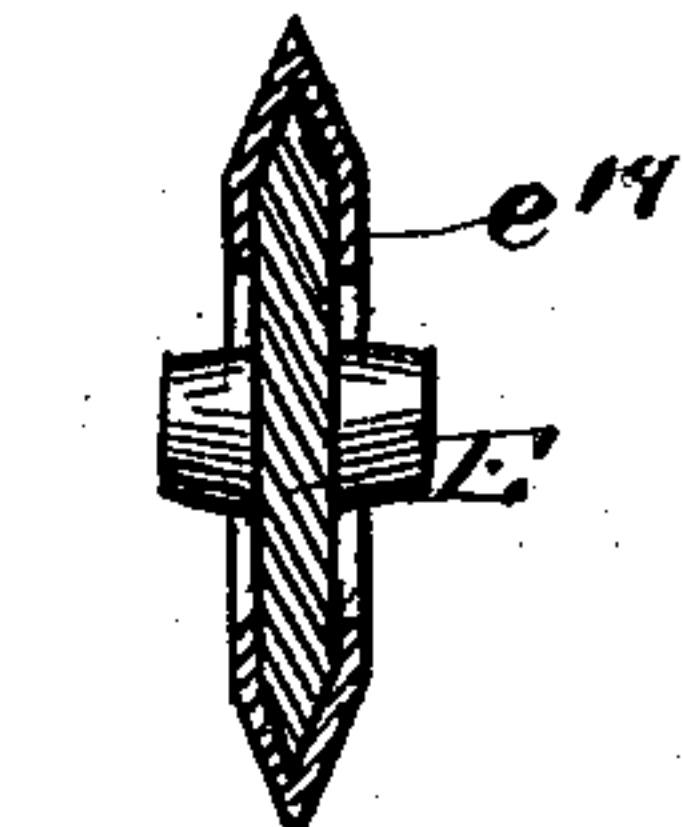
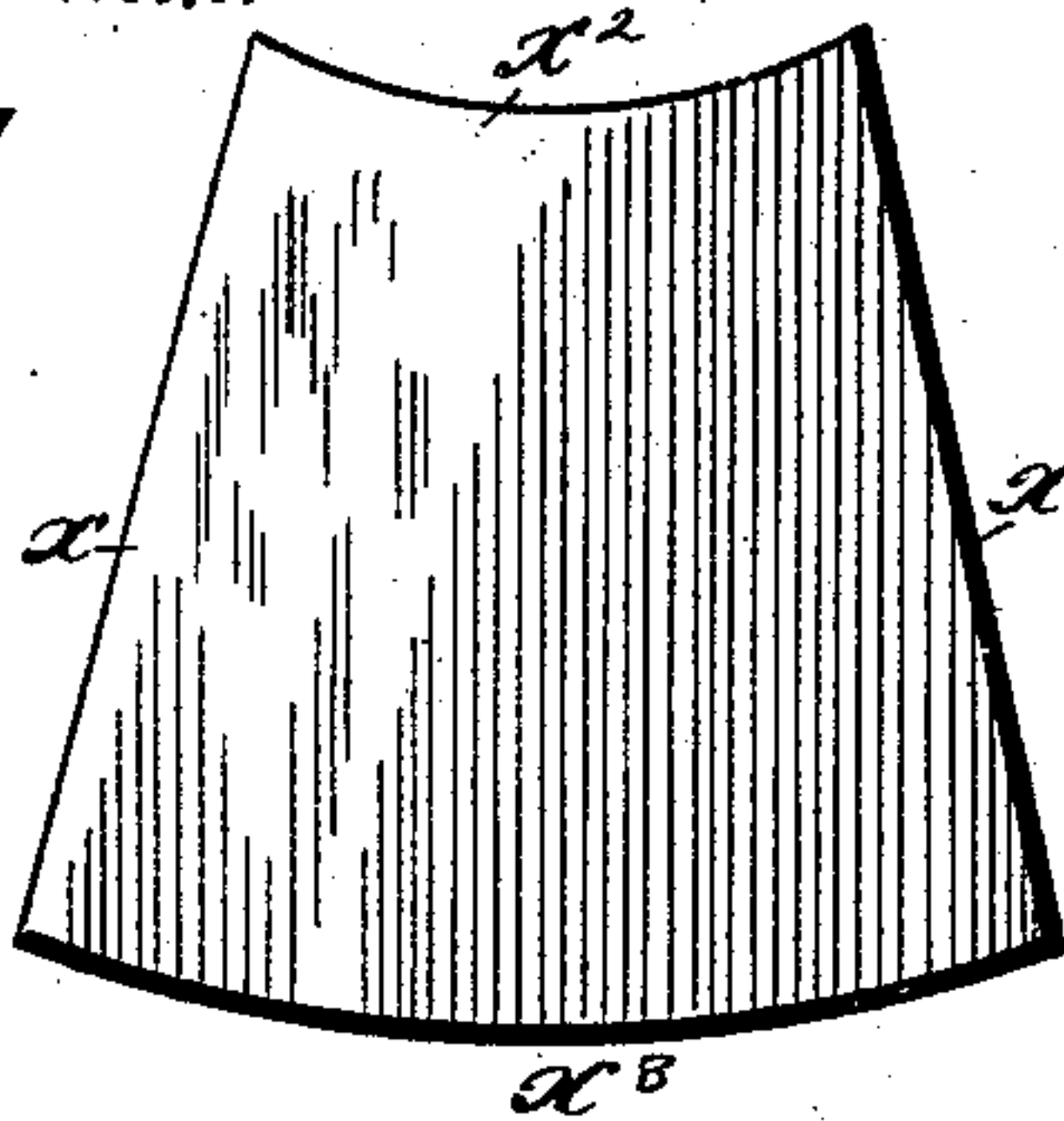


Fig. 8.

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Fig. 3.

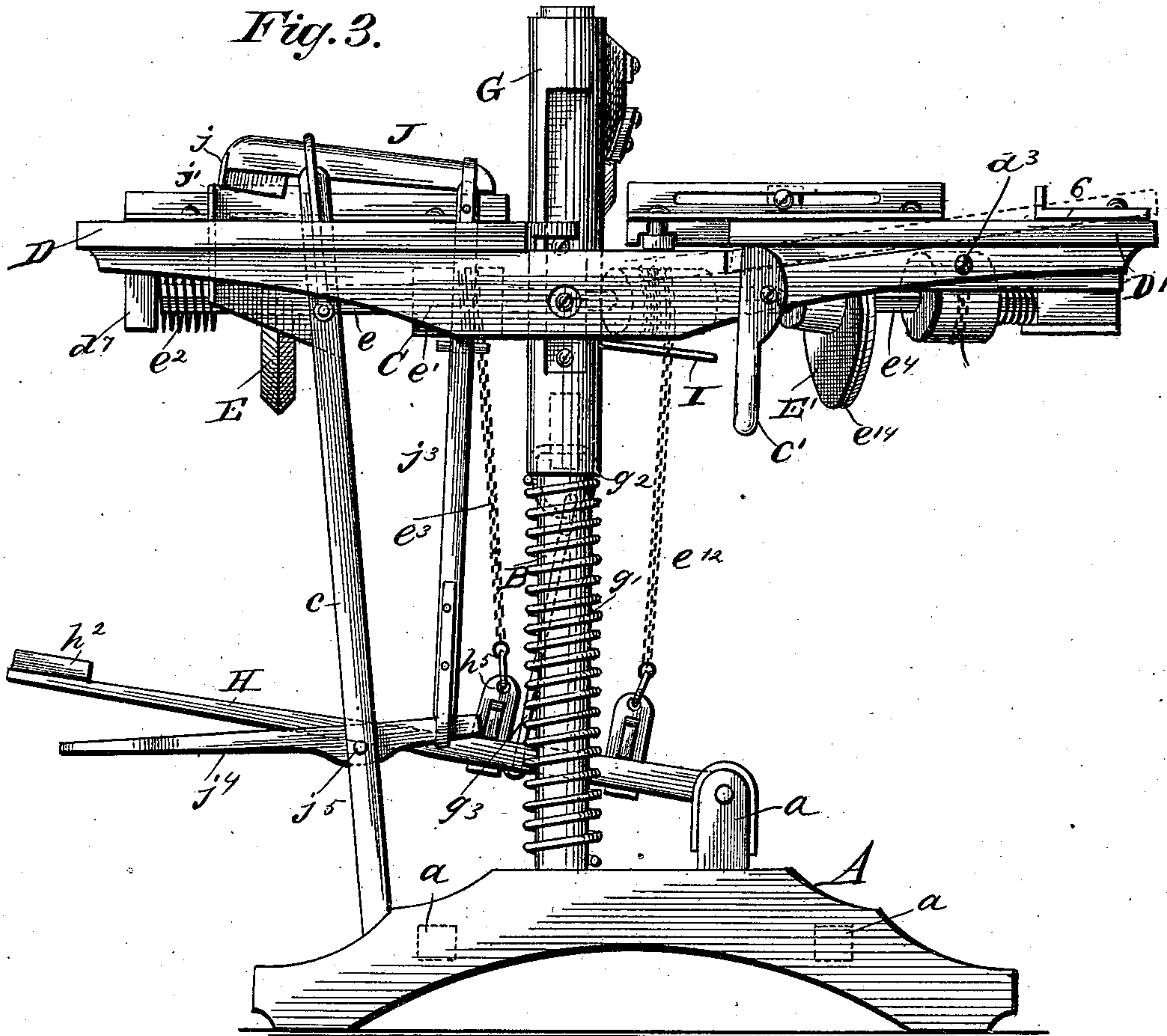
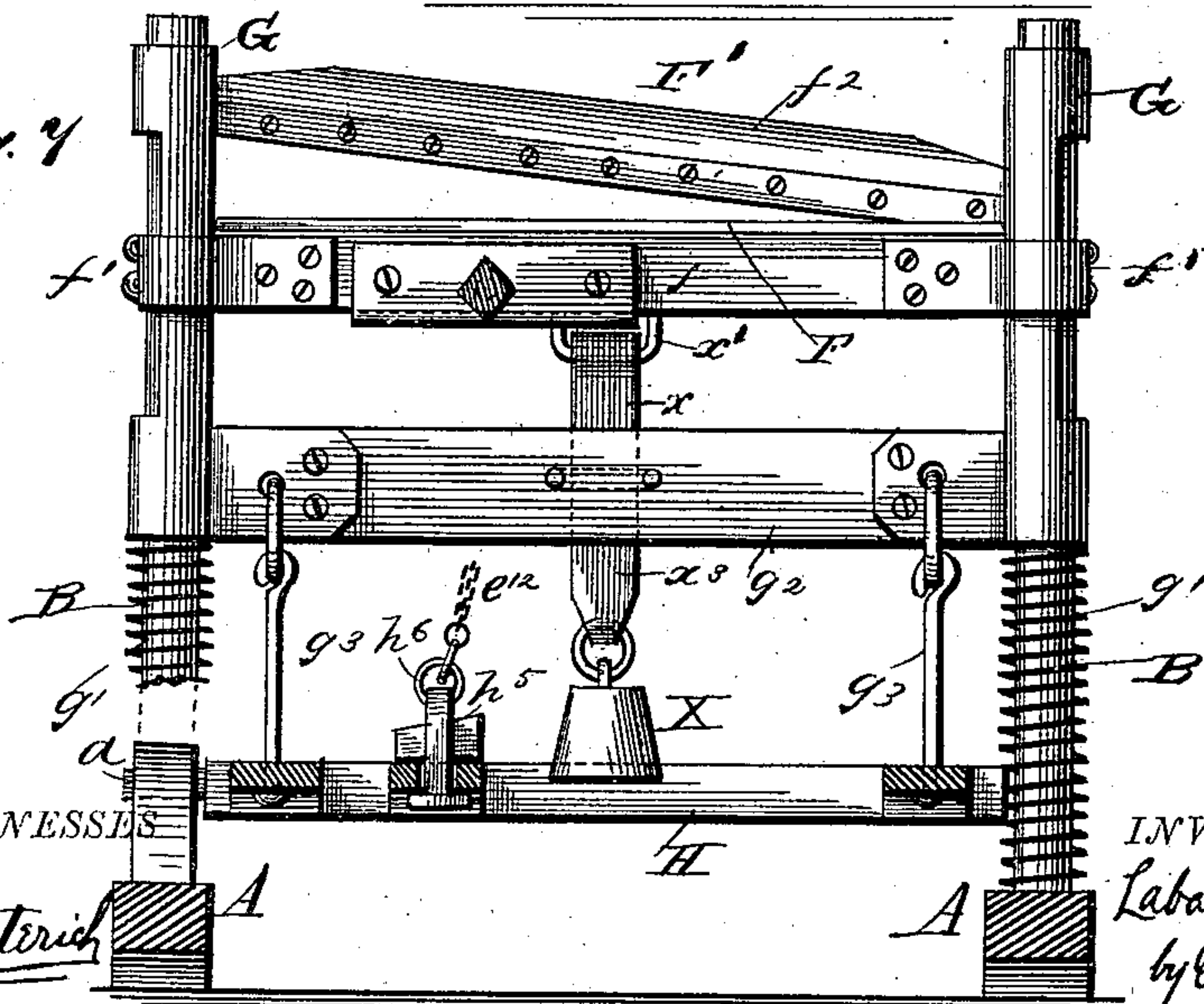


Fig. 4



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UNITED STATES PATENT OFFICE.

LABAN J. EVEREST, OF AU SABLE FORKS, NEW YORK.

MACHINE FOR CUTTING SHEET METAL.

SPECIFICATION forming part of Letters Patent No. 352,683, dated November 16, 1886.

Application filed March 8, 1886. Serial No. 194,426. (No model.)

To all whom it may concern:

Be it known that I, LABAN J. EVEREST, of Au Sable Forks, in the county of Essex and State of New York, have invented certain new and useful Improvements in Machines for Cutting and Shearing Sheet Metal; 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 ap-
10 pertains to make and use the same.

My invention relates to machines for cutting out forms for all kinds of sheet-metal ware—such as pails, bowls, handles, stove-pipes, elbows, &c.; and the object of my invention is
15 to produce a machine which shall be simple and durable in construction and rapid and exact in operation.

A further object of my invention is to produce a machine which shall turn out the forms
20 in finished condition, avoiding all buckling and burring in the cutting operation, and consequently avoiding any necessity of subsequent finishing, trimming, or hammering of the forms.

To the above purposes my invention consists in certain peculiar and novel features of construction and arrangement, as hereinafter described and claimed.

In order that my invention may be fully
30 understood, I will proceed to describe it, with reference to the accompanying drawings, in which—

Figure 1 is a top plan view of my improved machine. Fig. 2 is an under side plan view
35 of the same. Fig. 3 is an end elevation of the same. Fig. 4 is a detached view of the operating-treadle. Fig. 5 is a detached view of one of the guide-pulley shafts. Fig. 6 is a plan view of the form as cut out for a pail-rim.
40 Fig. 7 is a detached view showing a weight arranged to raise the movable blade of the shearing-knife. Fig. 8 shows a section of the feeding-pulley.

In the said drawings, A designates the bed
45 or feet of the machine, upon which are set two vertical standards, B, and which are joined together by two cross-braces, *a a*, as shown. Near the upper ends of the standards B are secured two cross-frames, C, which support
50 the work-table, and which may be braced by downwardly-extending pieces, *c*, as shown.

The work-table consists of two sections, D D', the former being the front section and the latter the back section. The front section, D, is secured rigidly in horizontal position upon
55 the front portion of the cross-pieces C, and is formed with an opening, *d*, to receive a pulley, E, to be hereinafter more fully described; and said table is also formed with two longitudinal slots, *d'*, to receive a guide, 1, and two
60 transverse slots, *d''*, to receive two guides, 2 3, the purpose of which guides will be hereinafter described, together with that of a transverse guide, 4. The rear section, D', of the work-
table is pivoted at *d'''* to the rear portion of the
65 cross-pieces C, and said section is adjusted upon its pivots by means of two cam-levers, *c'*, for a purpose to be hereinafter explained. This rear section is also formed with an opening, *d''''*,
70 to receive a pulley, E', an opening, *d'''''*, for the escape of scrap, and a pair of longitudinal slots, *d''''''*, to receive a guide, 5, the purpose of
75 pulley E' and guide 5, together with that of a guide, 6, upon this section of the work-table, being hereinafter explained. Between the up-
rights B, in horizontal position is secured a shearing knife or blade, F, which is rigidly se-
cured to a frame, *f*, the ends of which are at-
tached by straps *f'* to the two uprights B. This
80 blade or knife lies against and somewhat above the rear edge of the front table-section, D, as shown.

F' designates the movable blade of the shear-
ing-knife. This blade is attached to a backing-
piece, *f''*, which is in turn secured at its ends to
85 two lugs, *g*, upon two collars, G, in such manner that blade F' sets obliquely to the plane of blade F. The collars G are tubular in form, and surround the upper portions of the standards
90 B loosely, so as to move vertically thereon, and each of said collars rests upon a spring, *g'*, surrounding the standards B and bearing upon the feet A, the action of said springs being ex-
pansive, to hold knife F' upward, and to raise
95 the same after it has been depressed. The collars G are connected at their lower ends by a cross-bar, *g''*, and this cross-bar is in turn connected to the operating-treadle H by a pair
100 of rods, *g'''*, as shown. This treadle is of rectangular form, consisting of the longitudinal pieces *h*, to which the rods *g'''* are connected, and the transverse pieces *h'* *h''*, the latter con-

stituting the foot-rest. The transverse piece h' is extended and reduced at its ends to enter supports a upon the feet A, and thus form the pivot-bearing of the treadle. A longitudinal piece, h^3 , is set in the treadle-frame, and is formed with a slot, h^4 , opening at the rear end of the frame, as shown, and for a purpose to be hereinafter described.

Beneath the front table-section, D, is journaled a shaft, e , extending transversely of the machine and supported at its ends in hangers d' , depending from the section D. At its rear end this shaft carries a rigid drum, e' , and at its opposite end a spiral retracting-spring, e^2 , as shown. A chain, e^3 , is wound upon drum e' and extends downward to a sliding clamp, h^5 , working in the slot h^4 of treadle-piece h^3 . The arrangement is such that when the treadle is depressed the chain e^3 , acting on drum e' , revolves shaft e in one direction, while the spring e^2 revolves the shaft backward in the opposite direction when the treadle is released and as it is raised by the springs g' . This shaft e carries the pulley E, which surrounds a squared or angular portion of the shaft, the pulley-hub fitting the shaft sufficiently snug to turn properly therewith, but also in such manner as to permit the pulley to be moved longitudinally upon the shaft, for a purpose to be hereinafter explained, a thumb-screw being employed to hold the pulley, when adjusted, as shown.

Beneath the rear table-section, D', is mounted a shaft, e^4 , the inner end of which is journaled in a hanger, e^5 , depending from said table-section. The outer end of shaft e^4 is journaled in a carrier, e^7 , which slides in the hanger e^6 , so as to permit the outer end of the shaft to move laterally in the hanger e^6 , and this movement is accomplished by a chain, e^8 , secured at one end beneath the section D' and wound upon a drum, e^9 , which is rigid upon the shaft, so that as the shaft revolves the chain e^8 is wound upon the drum e^9 , and draws the outer end of the shaft forward. A spring, e^{10} , secured rigidly at one end beneath section D', is connected to carrier e^7 , and draws the shaft e^4 backward when released, these movements of the shaft being pivotal to the bearing of its front end in hanger e^5 . At its front end the shaft e^4 carries a rigid drum, e^{11} , around which a chain, e^{12} , is wound, and which chain leads to a sliding clamp, h^6 , working in slot h^4 in treadle-piece h^3 . Upon the rear end of shaft e^4 is placed a retracting-spring, e^{13} , the arrangement being such that when treadle H is depressed shaft e^4 is rotated in one direction by chain e^{12} , and when treadle H is released spring e^{13} rotates shaft e^4 in the opposite direction. Shaft e^4 carries a pulley, E', which is fitted snugly upon a square or angular portion of shaft e^4 , so as to turn therewith and slide thereon similarly as described with reference to pulley E on shaft e , this pulley being also provided with a thumb-screw for the purpose before stated.

The pulleys E E' are provided with rubber

peripheral rings or bands e^{14} , as shown, in order to increase the hold of said pulleys upon the sheet metal. These rings or bands serve to impart the necessary hold of the pulleys E E' upon the stock, and said bands preferably present a beveled or V-shaped edge to the stock, so as to reduce the points of contact between the stock and the bands to the minimum of extent. The rings e^{14} may, however, be of any other material which will act in a similar manner to rubber and prevent marring of the stock. The shafts or arbors $e e^4$ are provided with graduated scales e^{15} , to facilitate the adjustment of the pulleys E E' thereon. The treadle-piece h^3 is also provided with a graduated scale, e^{16} , to facilitate the adjustment of sliding clamps $h^5 h^6$ in the slot h^4 of the treadle-piece, said scale being contiguous to the slot, as shown. A chute, I, is secured beneath the opening d^5 , said chute being secured to the backing-piece f of the blade F and extending downward to guide the scrap out of the machine.

At the right-hand end of the front table-section, D, is placed a notcher, J, which is pivoted upon the upper end of brace c . The front end of this notcher carries an L-shaped knife, j , which acts in conjunction with a similarly-shaped knife, j' , upon the table-section D, said knife j' being placed contiguous to an opening, j^2 , in the table-section D. A link, j^3 , connects the rear end of the notcher J with the rear end of an auxiliary treadle, j^4 , which is pivoted at j^5 in the brace c . This notcher is designed to notch stove-pipe, elbow-blanks, pans, pails, dippers, &c., and other articles being cut in the machine.

As previously stated, the machine is capable of cutting out a large class of sheet-metal forms, and hence a description of all of its operations would be unnecessary here.

In order to render the general operation of the machine apparent, I will describe its action in cutting out the form for a sheet-metal pail.

The guides 1, 2, 3, 4, and 5 being in the position shown in Fig. 1, and the pulleys E E' and sliding clamps $h^5 h^6$ being adjusted to the scale corresponding with the dimensions of the form to be cut, the two oblique or mitering cuts $x x'$ (see Fig. 6,) are made. The surface or edge x is first laid against the guide 2, the corner of the sheet of stock resting against the stop 2^x thereof, and the knife F' is brought down, severing the waste, forming the cut x . This cut is then placed against the gage 3 and against the stop 1^x thereon. Upon depressing knife F' the cut x' is made. To cut the circles $x^2 x^3$ the form is first placed over the pulley E and the hand pressed upon the form, so as to cause the latter to bear upon said pulley. As the treadle is depressed, the revolution of the pulley will cause the form to move in a true circle, and consequently the cut made by the knives will be true and clean, and of exactly the required form. The form is now placed on the rear table against guide 5 and the hand

pressed upon the form to make proper contact with pulley E'. As the treadle descends, the revolution and forward movement of pulley E, carrying the blank with it, cause the proper circular cut to be given by the knives and prevent buckling of the form. The form is now ready to be notched and its edges $x x'$ soldered together.

Suitable patterns are used in determining the position, extent, and direction of the cuts, and a number of forms may thus be cut simultaneously.

In cutting stove-pipe the table-section D' is raised by its cam-arms, so that the iron shall be clear of the table, to prevent bending the iron.

This machine is intended to cut tin or thin sheet-iron, and is of almost universal use in such work, cutting a great variety of forms and doing its work accurately and rapidly.

I do not wish to be understood as confining myself exclusively to the precise details of construction herein described, as many variations may be made therein without departing from the essential spirit of my invention.

In Fig. 7 I have shown a modified form of construction in which the upper cutting-knife is raised by a weight, X, depending from a strap, x , secured at one end to the said weight and at its opposite end to the cross-bar g^2 , and also running through a strap, x' , upon the backing-piece of the stationary knife. In this arrangement the lifting-springs before described are dispensed with and less power is required to depress the treadle. The weight X also possesses the advantage of acting constantly and uniformly, which is not the case with the springs.

Having thus described my invention, what I claim as new therein, and desire to secure by Letters Patent, is—

1. The combination, with the shearing-knives and the adjustable gages mounted upon the table, of the feeding-pulleys E E', adjustable upon their arbors, substantially as described.

2. The combination, with the shearing-knives, of the feeding-pulleys E E', adjustable upon their arbors, the operating-treadle, and the chains connected therefrom to the arbors, said chains being secured adjustably to the treadle, substantially as and for the purpose set forth.

3. The combination, with the shears F F', of the pivoted table-section D', as described.

4. The combination, with the fixed and movable shears and the rotary shafts carrying the feed-pulleys, of the operating-treadle connected to the movable knife and to the said shafts in such manner as to actuate the same simultaneously, substantially as set forth.

5. The combination, with the standards B and the cross-pieces C, of the collars G, carrying the movable knife, the fixed knife supported between the standards, the shaft e , with its adjustable pulley, drum, and retracting-spring, the shaft e^4 , with its adjustable pulley and retracting and withdrawing springs, the chain for drawing said shaft forward, and the table-sections D D', with their slots and adjustable guides, substantially as described.

6. In a sheet-metal-cutting machine, the combination, with a treadle mounted upon a suitable supporting-frame and a rotating and pivotally-moving shaft mounted upon said frame and carrying a pair of drums, of a chain wound upon one of said drums and connected to the treadle, a second chain wound oppositely upon the other drum and connected to said frame, and a pulley mounted upon said shaft and engaging the stock for moving and guiding it to the cutters, substantially as set forth.

7. The combination, with the frame and the fixed and rigid table-sections having slots, openings, and adjustable and fixed guides, of the fixed and movable knives, the springs for sustaining and raising the movable knife, the fixed and pivotally-moving arbors carrying the feed-wheels, the drums, retracting and withdrawing springs for the same, the treadle with its adjustable connections to the arbors, and the adjustable pulleys upon said arbors, as set forth.

8. In a machine for cutting sheet-metal forms, the combination, with the cutting-knives, of guiding-pulleys and actuating connections to feed the blank beneath the cutters in such manner as to produce curved cuts of predetermined extent and relative proportions, substantially as described.

In testimony whereof I have hereunto subscribed my name in the presence of two subscribing witnesses.

LABAN J. EVEREST.

Witnesses:

CHARLES A. BRAGDON,
E. W. FEATHERSTON.