

No. 687,936.

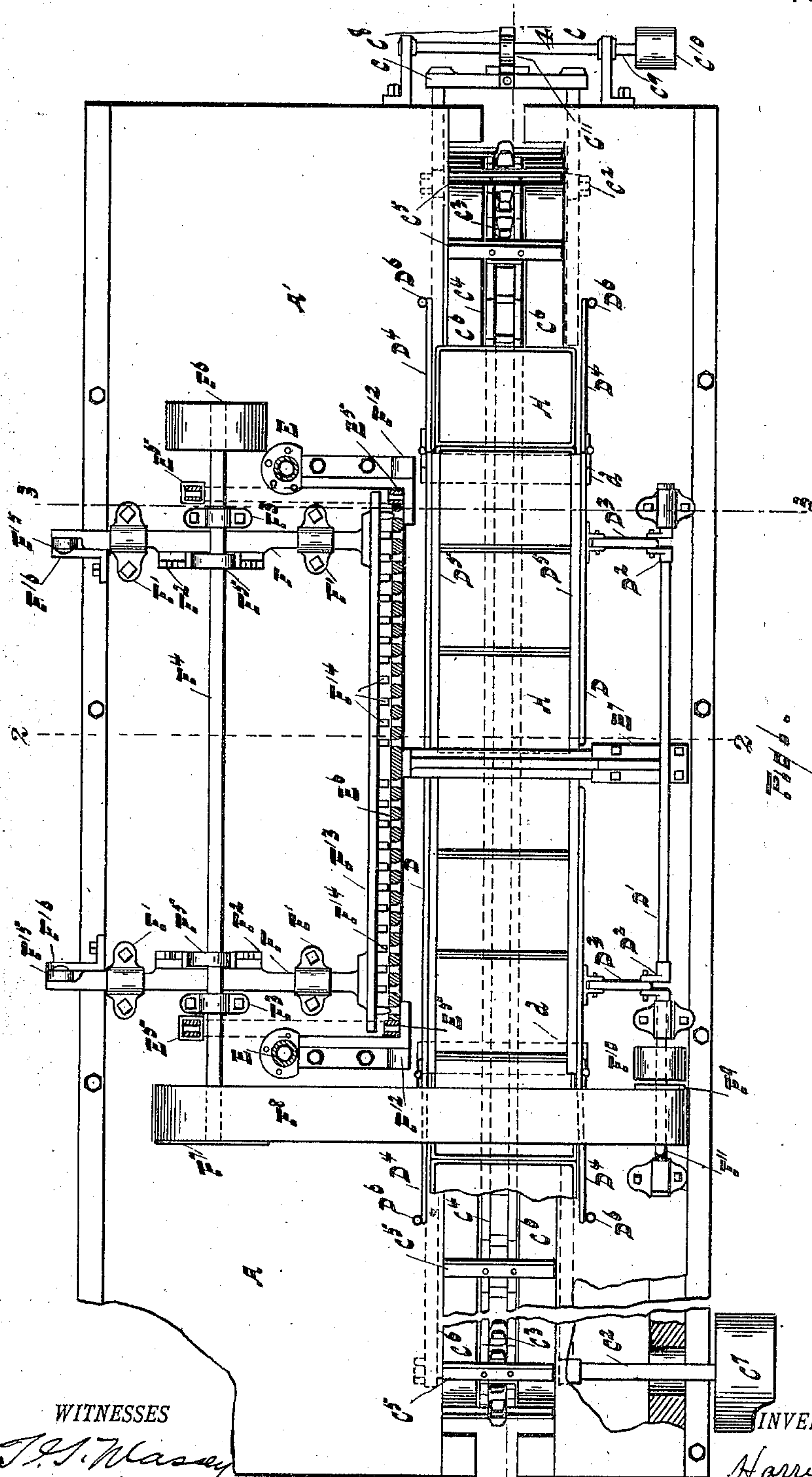
Patented Dec. 3, 1901.

H. C. LA FLAMBOY.
MATCH BOXING MACHINE.

(Application filed May 18, 1901.)

(No Model.)

4 Sheets—Sheet 1.



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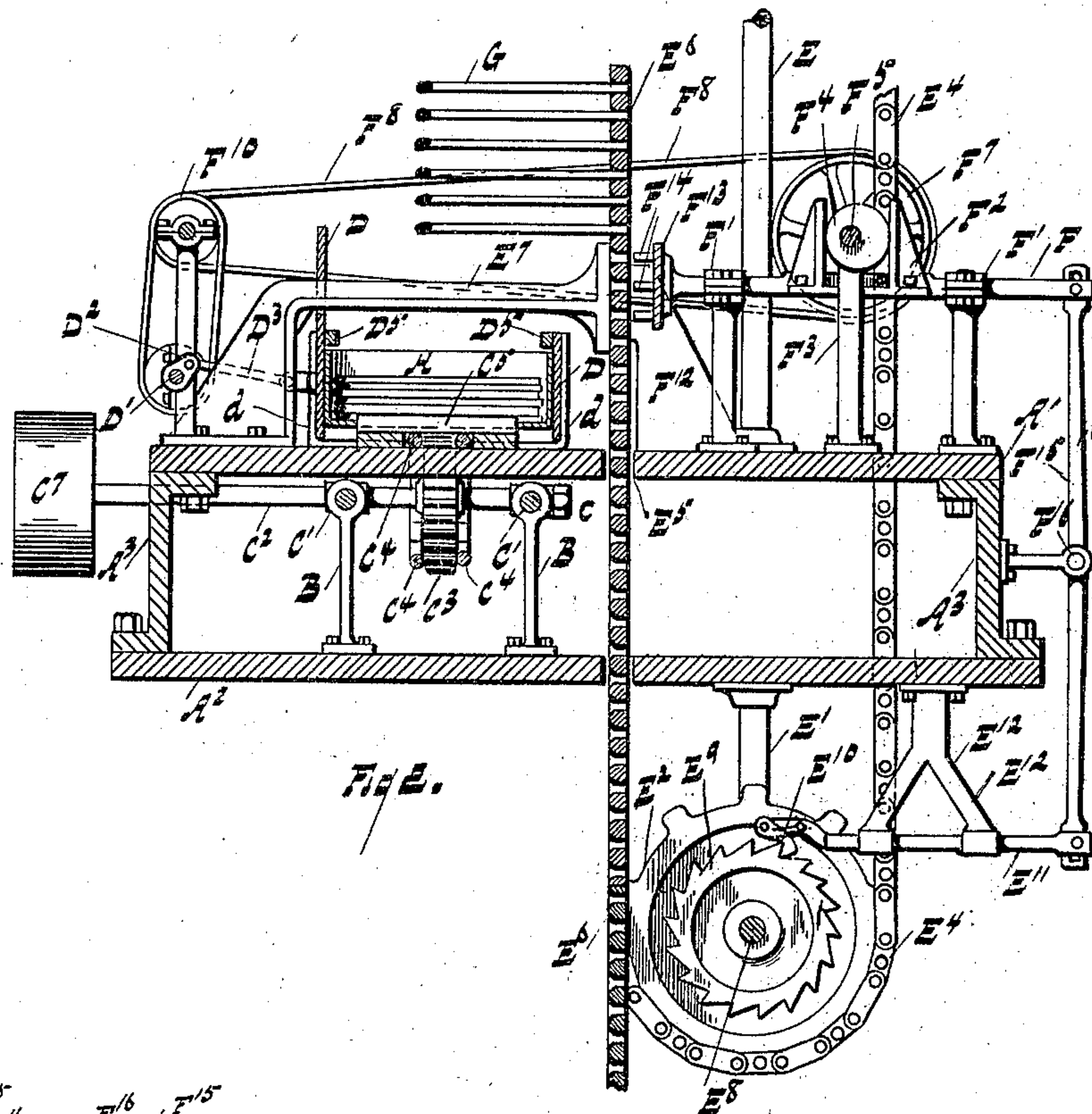


Fig. 2.

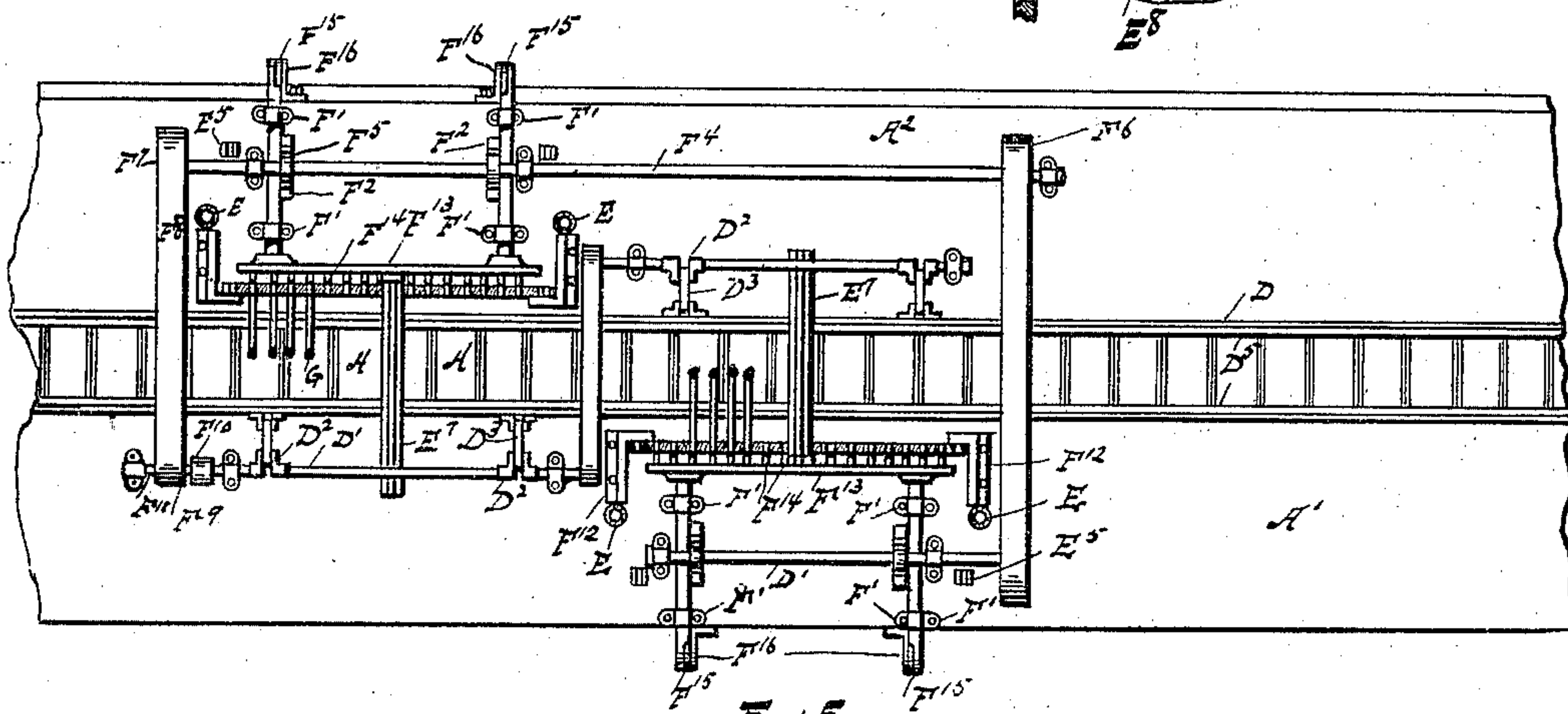


Fig. 5.

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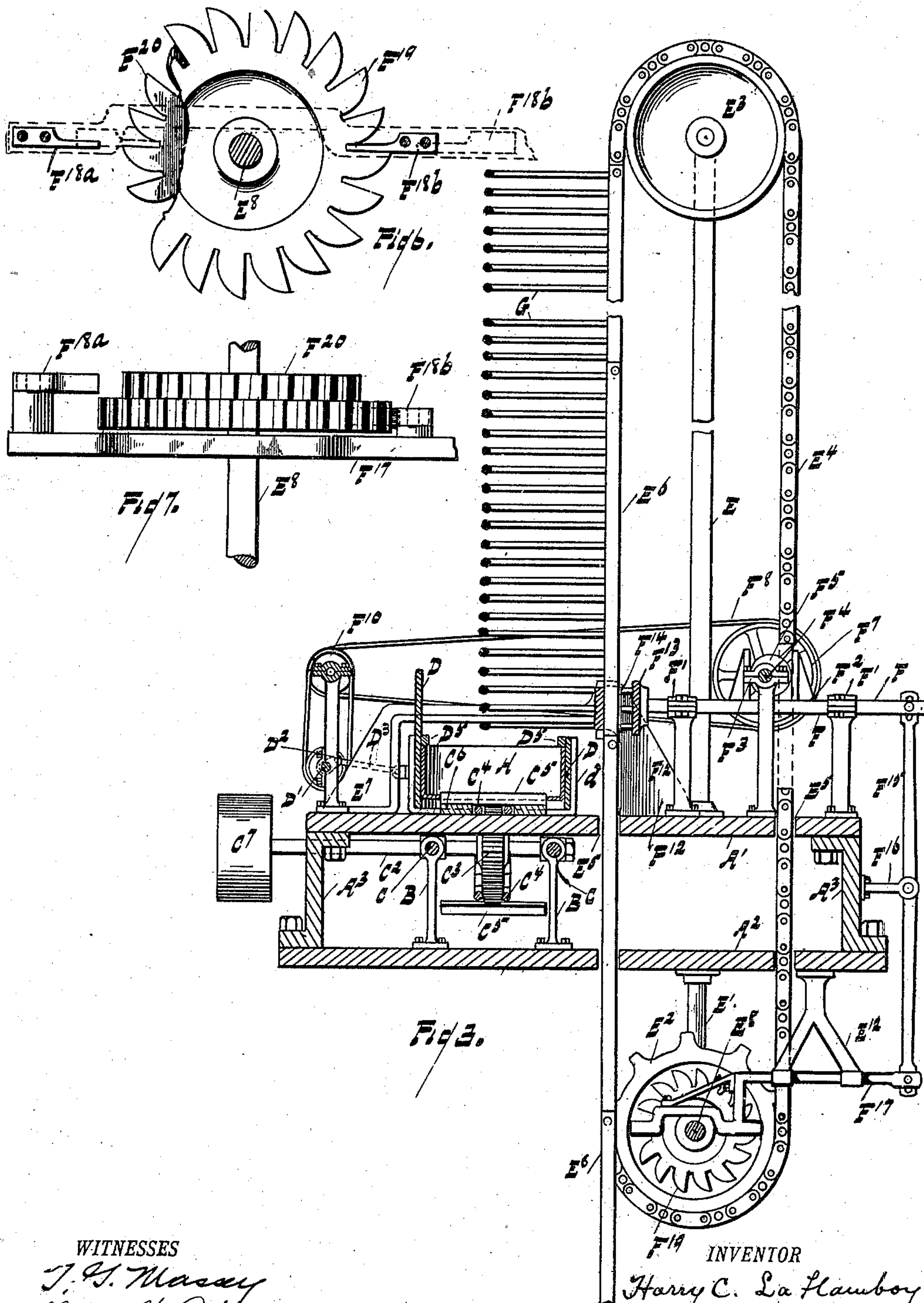
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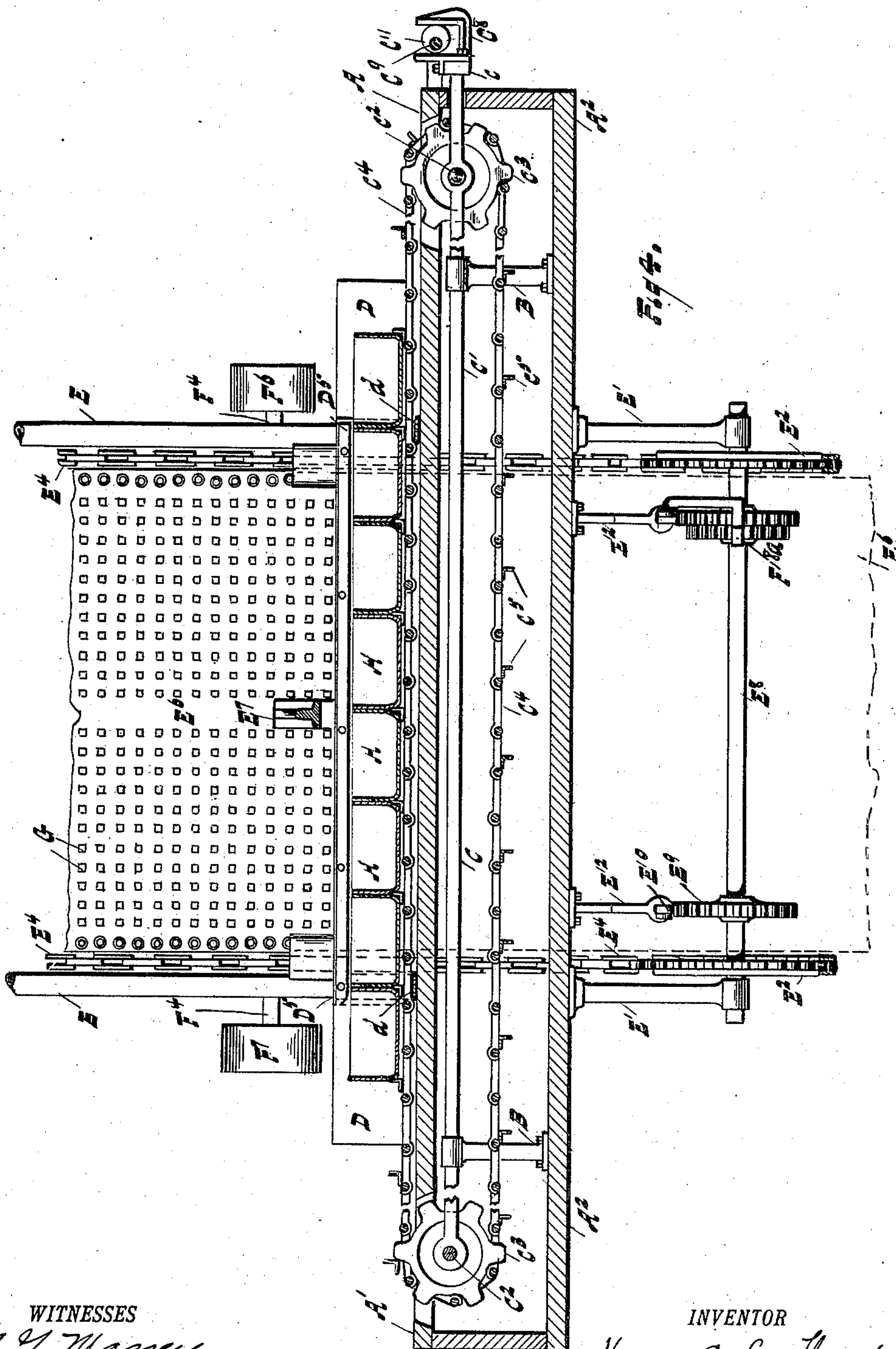
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UNITED STATES PATENT OFFICE.

HARRY C. LA FLAMBOY, OF DETROIT, MICHIGAN, ASSIGNOR OF TWO-THIRDS
TO ROBERT THUNER AND BETHUNE DUFFIELD, OF DETROIT, MICHIGAN.

MATCH-BOXING MACHINE.

SPECIFICATION forming part of Letters Patent No. 687,936, dated December 3, 1901.

Application filed May 18, 1901, Serial No. 60,805. (No model.)

To all whom it may concern:

Be it known that I, HARRY C. LA FLAMBOY, a citizen of the United States, residing at Detroit, county of Wayne, State of Michigan, have invented a certain new and useful Improvement in Match-Boxing Machines; and I 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 pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to machines for placing matches in boxes; and it consists in the improvements hereinafter described, and pointed out in the claims.

Referring to the accompanying drawings, Figure 1 is a plan view, partly in section, of a machine embodying my invention. Fig. 2 is a section on the line 2 2 of Fig. 1. Fig. 3 is a cross-section of the complete machine on a line corresponding to 3 3, Fig. 1. Fig. 4 is a section on the line 4 4 of Fig. 1. Fig. 5 is a plan view of the machine, illustrating the method of placing the matches into the boxes so that the heads of a part of said matches shall be in one direction and part in the other direction. Fig. 6 is a detail illustrating the mechanism for regulating the motion of the carrier-plates. Fig. 7 is a view of the mechanism shown in Fig. 6 looking from above, as shown in said figure.

A is the base of the machine, consisting of a top plate A' and a bottom plate A², joined together by plates A³.

B represents standards rising from the base-plate A², their tops being below the top plate A'. There are two pairs of said standards, one pair being located toward one end of the base A and the other pair toward the other end of said base.

C is a frame extending lengthwise of the base A beneath and parallel to the top plate A'.

C' represents the side rods of the frame C. The side rods C' pass through apertures in the tops of the standards B and are adapted to reciprocate therein.

c is a cross-piece between the rods C' C'.

C² C³ are shafts extending between the side rods C' C', one of said shafts toward each end of

the frame C. The shafts rest and are adapted to turn in bearing on the side rods C' C'. C³ represents sprocket-wheels, one at the center of each of said shafts and of sufficient diameter so that they extend through slots in the top plate A'.

C⁴ is a sprocket-chain extending around the wheels C³, the upper strand of said chain being above the top plate A'.

C⁵ represents flanges attached to the chain C⁴ at intervals equal to the width of the match-boxes to be filled and extending outward from said chain and also bending at right angles and extending in a plane parallel to said chain. The length of said flanges extending laterally to said chain is a little less than the length of a match-box.

C⁶ represents ways raised a little from the upper surface of the top plate A' and extending longitudinally thereof. The ways C⁶ serve as guides for the flanges C⁵ and hold the same in a horizontal position while passing over the top plate A'. The upper strand of the chain C⁴ passes between the ways C⁶.

C⁷ is a pulley upon one of the shafts C², through which the chain C⁴ may be driven.

C⁸ is a fork connected to the cross-piece c of the frame C.

C⁹ is a shaft resting in bearings on the end of the base A.

C¹⁰ is a pulley upon the shaft C⁹.

C¹¹ is a cam upon the shaft C⁹, between the branches of the fork C⁸. By turning the shaft C⁹ by means of the pulley C¹⁰ the cam C¹¹ is caused to act against the branches of the fork C⁸ to oscillate the frame C.

D D are two vertically-extending plates lying parallel to each other and a distance apart equal to the length of a box, one of said plates being on each side of the chain C⁴ above and adjacent to the top plate A'. The plates D D are connected together by cross-pieces d d, Figs. 2, 3, and 4.

D' is a shaft resting in bearings on the base A and extending parallel thereto above its upper surface and parallel to the upper strand of the chain C⁴.

D² D² are cranks upon the shaft D', which are connected to the plates D D by connecting-rods D³ D³. When the shaft D' is rotated,

the plates D D are reciprocated thereby in a direction transverse to the motion of the upper strand of the chain C⁴.

D⁵ D⁵ are strips along the inner sides of the plates D D near the upper edge thereof.

D⁴ D⁴ D⁴ D⁴, Fig. 1, are vertically-extending plates hinged at the ends to the plates D D and forming extensions thereof. The outer ends of the plates D⁴ are restrained from lateral motion by pins D⁶, extending from the top plate A'. While the plates D are oscillated, as above described, the outer ends of the plates D⁴ remain fixed, so that the boxes will enter between them without difficulty.

E E are standards rising from the top plate A', and E' E' are hangers extending downward from the bottom plate A² in line with the standards E E.

E² E² are sprocket-wheels pivoted at the lower ends of the hangers E' E', and E³, Fig. 3, is one of the two pulleys pivoted at the upper ends of the standards E opposite to the sprocket-wheels E².

E⁴ E⁴ are sprocket-chains passing over and engaging the teeth of the wheels E², passing through slots in the base A, and passing over the pulleys E³. The two inner strands of the chains E⁴ pass through a slot E⁵ in the base A, which extends between said strands parallel to the chain E⁴, to the ways C⁶, and the plates D D. The chains E⁴ are provided with holes to receive the pintles of the plates E⁶.

E⁶ represents foraminous plates into the holes in which match-sticks are placed for dipping and from which the matches are to be discharged into the boxes. The plates E⁶ are provided with pintles extending from lateral edges near one of the ends adapted to pass into the holes in the chains E⁴ to suspend said plates from said chains.

E⁷ is a brace secured to the top plate A' of the base and adapted to bear at its end against a descending plate E⁶ to prevent said plate being bent when the matches are forced out of it.

E⁸ is a shaft extending between the sprocket-wheels E² and keyed to said wheels.

E⁹ is a ratchet-wheel keyed upon the shaft E⁸.

E¹⁰ is a pawl adapted to actuate the wheel E⁹.

E¹¹ is a reciprocating rod bearing in guides in the hanger E¹².

F represents rods adapted to reciprocate in guides in the standards F' in a direction perpendicular to the plate E⁶, which is hanging upon the vertical portions of the chains E⁴.

F² F² are cam-faces upon the rod F.

F³ F³ are standards extending upward from the top plate A' of the base.

F⁴ is a shaft adapted to turn in bearings in the standards F³.

F⁵ is a cam upon the shaft F⁴, adapted to act upon the cam-faces F² to reciprocate the rod F.

F⁶ is a pulley upon the shaft F⁴, through which motion may be communicated to it.

F⁷ is a second pulley upon the shaft F⁴.

F¹¹ is a counter-shaft resting in bearings in standards rising from the top plate A'.

F⁹ is a pulley upon the shaft F¹¹.

F⁸ is a belt passing around the pulleys F⁷ and F⁹ and adapted to communicate motion from the shaft F⁴ to the counter-shaft F¹¹.

F¹⁰ is a belt adapted to communicate motion from the counter-shaft F¹¹ to the shaft D'.

F¹² represents guides for the descending plates E⁶.

F¹³ is a plate upon the inner end of the reciprocating rods F.

F¹⁴ represents small rods or punches extending from the inner surface of the plate F¹³ and adapted to pass into the holes in the plate E⁶ to displace the matches therefrom.

F¹⁵ F¹⁵ are rock-arms pivoted at F¹⁶ to the base A and connected at their upper ends to rods F and at their lower end to the rods E¹¹ and F¹⁷. The reciprocation of the rods F rocks the arms F¹⁵, one of which reciprocates the rod E¹¹ and the other a similar rod F¹⁷, Figs. 3 and 6, which latter bears stop-pawls F^{18a} F^{18b} on its inner end, which act upon cam-wheels F¹⁹ F²⁰, keyed upon the shaft E⁸, to regulate the motion of said shaft. Said cam-wheels are furnished with cam-faced teeth, the outlines of which are such that they shall act in conjunction with the pawls F^{18a} and F^{18b} to permit the proper motion of the wheels, and therefore the shaft E⁸. A small portion of the bottom of the notches between the teeth is arranged with parallel walls, so that when one of said pawls is at the bottom of one notch and the other of said pawls is entirely out of the opposite notch the motion of the wheels will be completely constrained by the first-mentioned pawl.

The operation of the above-described device is as follows: The plates E⁶, filled with finished matches, are placed one by one between the descending strands of the chains E⁴, the pintles extending from the lateral edges of the plates engaging in holes in said chains. Boxes for the reception of the matches are placed upon the flanges C⁵, which are on the upper strand of the chain C⁴. Power is then applied to the pulley C⁷ by a vertically-extending belt, which rotates the shaft C², to which said pulley is attached, which carries with it the sprocket-wheel C³, which is secured to the same and causes the chain C⁴ to move, carrying the boxes H along with it between the flanges D D, and in front of the plate E⁶ a belt is also applied to the pulley C¹⁰, which rotates the shaft C⁹, which oscillates the frame C, by means of the cam C¹¹. Power is also applied to the pulley F⁶, which rotates the shaft F⁴ and pulley F⁷, which rotates the counter-shaft F¹¹, by means of a belt F⁸. The rotation of the counter-shaft F¹¹ rotates the shaft D' by means of the belt F¹⁰, and the rotation of the last-named shaft oscillates the flanges D, and at each motion said flanges contact the boxes which are between them, giving said boxes a quick

motion in the direction of the movement of said flanges. The rotation of the shaft F^4 oscillates the rod F by means of the cam F^5 and the cam-faces F^2 , each inward oscillation of the rod F causing the rods F^{14} to pass into the holes in the plates E^6 and force out the matches in said holes, which drop into the boxes H in front of said plate. Each outward movement of the rod F oscillates the rocking arm F^{15} , carrying its upper end outward and its lower end inward, the latter carrying the rod E^{11} inward, moving the ratchet-wheel E^9 one tooth along and lowering the plate E^6 until another set of holes comes in front of the rods F^{14} , when the above-described operation is repeated. Centering-rods operated by the levers F^{15} and entering special apertures in the plates E^6 may be used, if desired, to accurately fix the plate in position for the action of the rods F^{14} . As the plates E^6 become emptied of their matches and pass below the base A they are detached from the chains E^4 by an attendant and returned to the filling-machine. I arrange the apparatus so that at least two of the above-described plate-emptying apparatus shall act to fill the boxes while passing along upon the chain C^4 , and I arrange such apparatus so that half the matches shall be filled from one side and half from the other side, as shown in Fig. 5. This brings the heads or larger parts of half of the matches in one direction and the other half in the other direction, so that the matches at the top of the box will lie level. The motion of the rock-arms F^{15} which carries the rod E^{11} inward also carries the rod F^{17} inward, the first part of the inward motion of said rod carrying the stop-pawl F^{18a} along and out of the inner parallel-sided portion of a notch in the wheel F^{20} and carrying the stop-pawl F^{18b} along and into contact with the outer portion of the curved wall of a notch in the wheel F^{19} . At this point of the stroke the pawl E^{10} contacts a tooth of the ratchet E^9 and begins to rotate the shaft E^8 . During the further motion of the pawl E^{10} the stop-pawls F^{18a} F^{18b} pass along the curved walls of their respective notches until the motion is nearly completed, when the pawl E^{10} clears the teeth of its wheel and the stop-pawl F^{18b} enters the parallel-walled inner portion of its slots. It will be noticed that by the above-described apparatus the motion of the shaft E^8 is always constrained, because one of the pawls F^{18a} or F^{18b} is in the portion of its slot at which the walls of its slot contact it on both sides, or else one of said pawls contacts a tooth so as to prevent rotation in one direction and the other of said pawls contacts a tooth so as to prevent motion in the other direction.

I claim—

1. In a match-box-filling machine, the combination of means for causing the boxes to pass consecutively past two given points,

means located at one of said points for delivering the matches to said boxes with their heads all in one direction, and means located at the other of said points for delivering the matches to the boxes with their heads all in the other direction.

2. In a match-box-filling machine, the combination of a base, a frame adapted to reciprocate on said base, sprocket-wheels mounted toward the ends of said frame, a sprocket-chain passing over said wheels, said chain being adapted to transport the match-boxes, means for rotating one of said sprocket-wheels, and means upon said base for reciprocating said frame in its bearings.

3. In a match-box-filling machine, the combination of a base, a frame adapted to reciprocate on said base, sprocket-wheels mounted toward the ends of said frame and having their peripheries extending to the surface of said base, a sprocket-chain adapted to transport the boxes passing around said wheels and along the surface of said base, plates extending vertically to the surface of said base upon each side of said chain and means for reciprocating said plates toward and away from said chain, substantially as and for the purpose described.

4. In a match-box-filling machine, the combination of a base, a frame adapted to reciprocate on said base, sprocket-wheels mounted toward the ends of said frame and having their peripheries extending to the surface of said base, a sprocket-chain, adapted to transport the boxes, passing around said wheels and along the surface of said base, plates extending vertically to the surface of said base upon each side of said chain, a plate hinged at its end to the end of each of the first-mentioned plates and forming an extension thereof, the outer ends of said extension-plate being hinged to said base, and means for reciprocating the first-mentioned plates toward and away from said chain, substantially as and for the purpose described.

5. In a match-box-filling machine, the combination of a base, a frame adapted to reciprocate on said base, sprocket-wheels mounted toward the ends of said frame and having their peripheries extending to the surface of said base, a sprocket-chain adapted to transport the boxes, passing around said wheels and along the surface of said base, plates extending vertically upon each side of said chain and united together beneath said chain and means for reciprocating said plates laterally to the motion of said boxes, substantially as and for the purpose described.

In testimony whereof I sign this specification in the presence of two witnesses.

HARRY C. LA FLAMBOY.

Witnesses:

MAY E. KOTT,

ELLIOTT J. STODDARD.