

(No Model.)

5 Sheets—Sheet 1.

G. E. NORRIS & W. E. HAGAN.

MATCH MAKING MACHINE.

No. 332,737.

Patented Dec. 22, 1885.

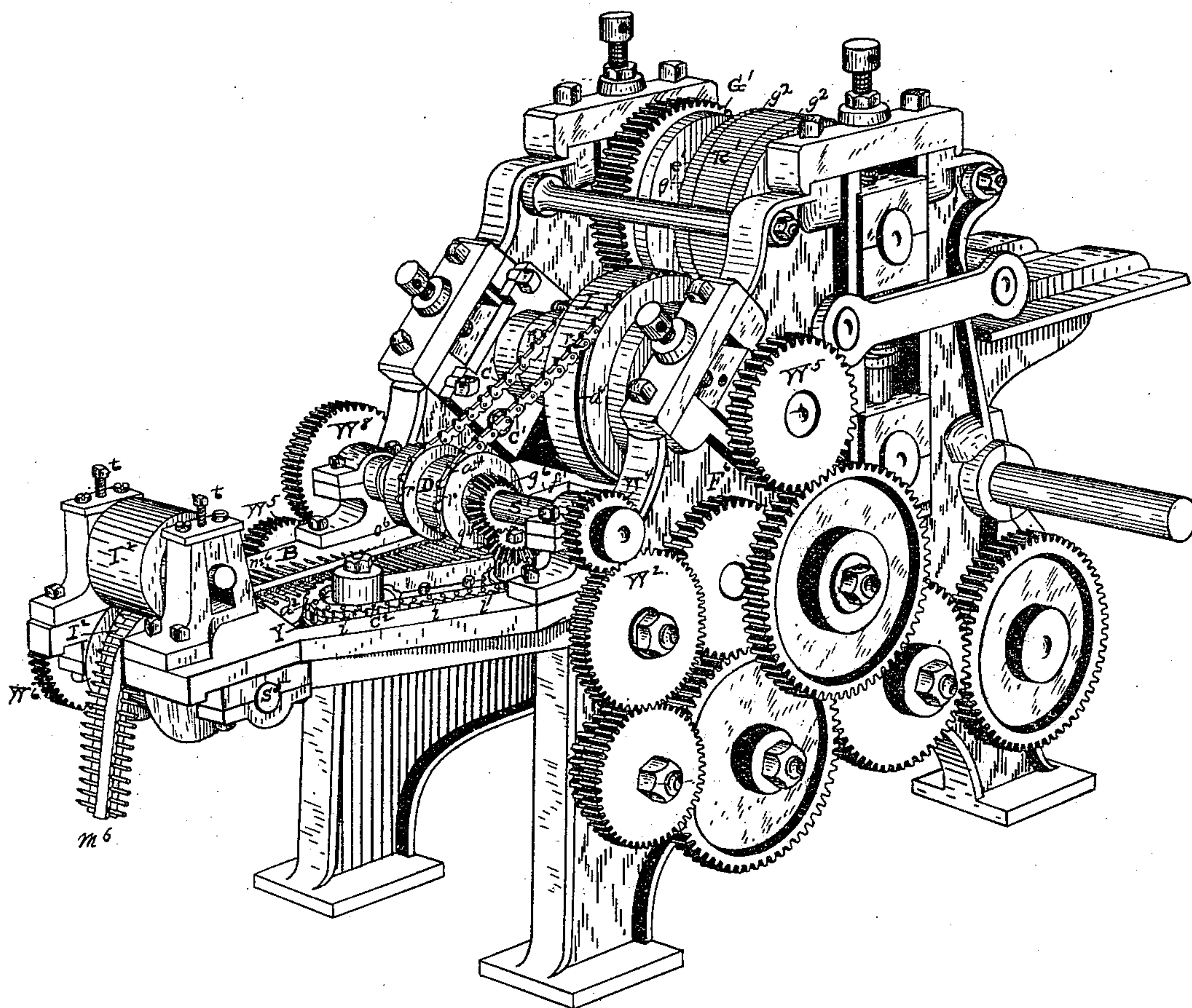


FIG. 1

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WITNESSES:

Stanley M. Holden.

Charles S. Brintnall

(No Model.)

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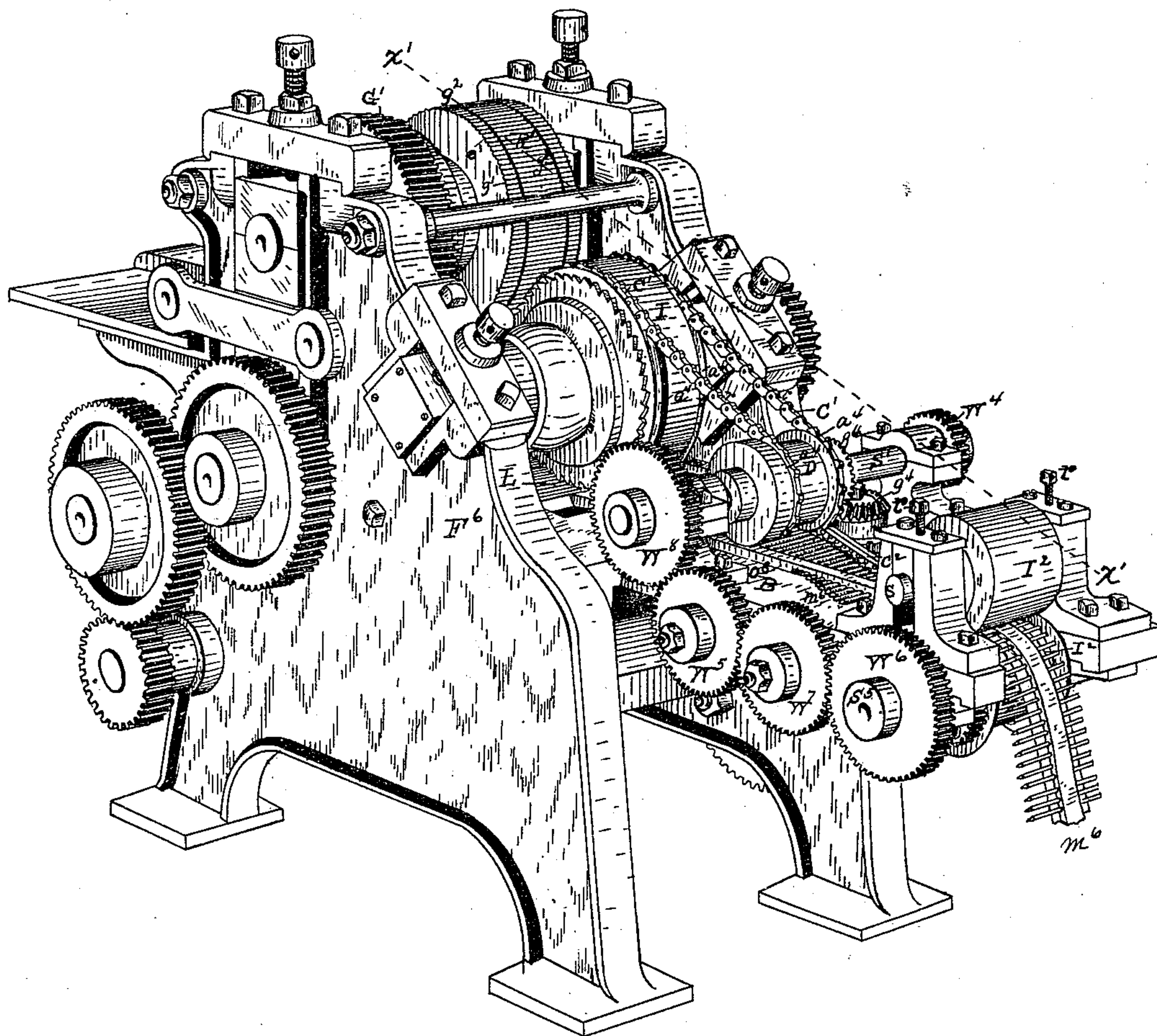


Fig. 2

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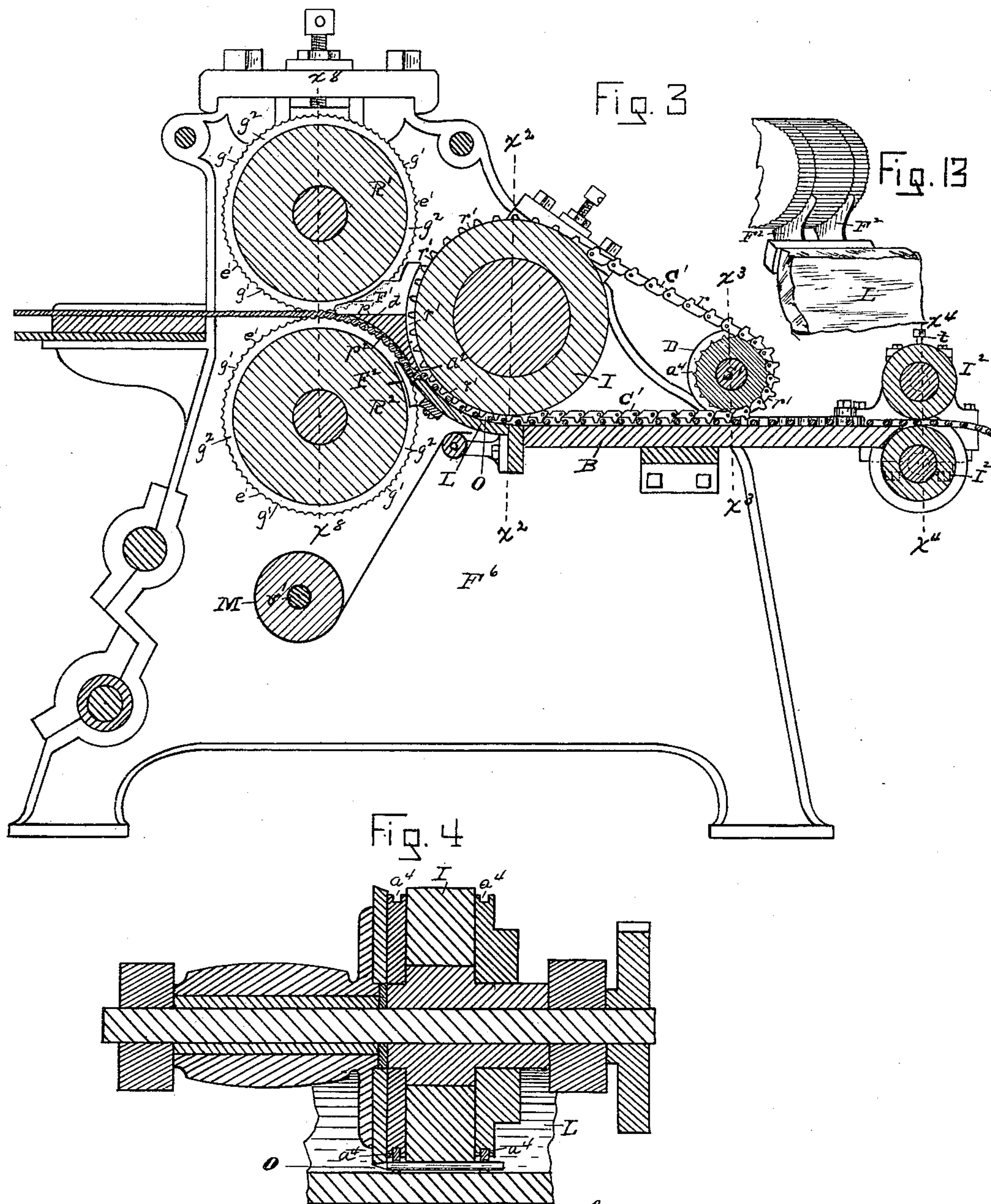
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WITNESSES:

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(No Model.)

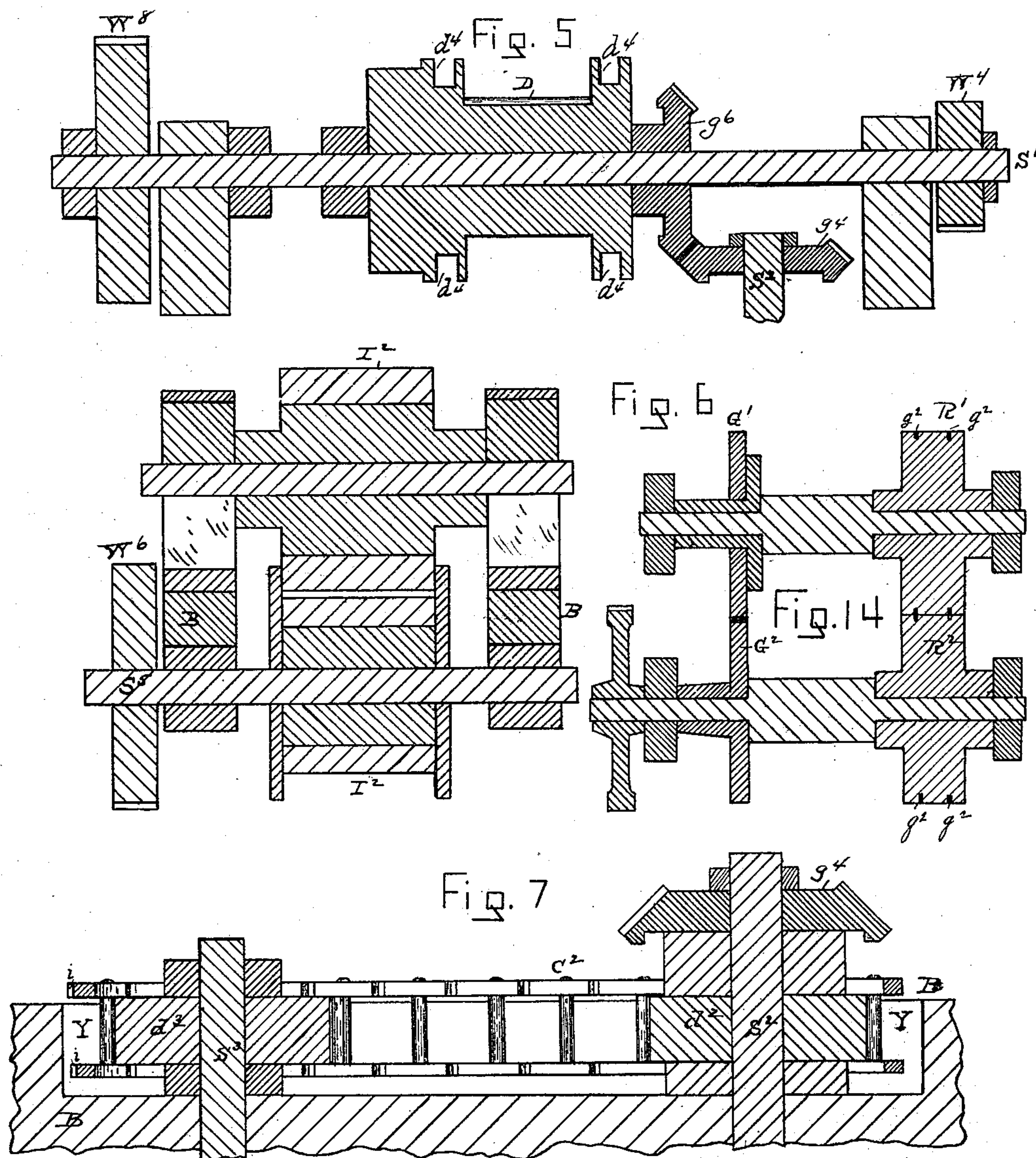
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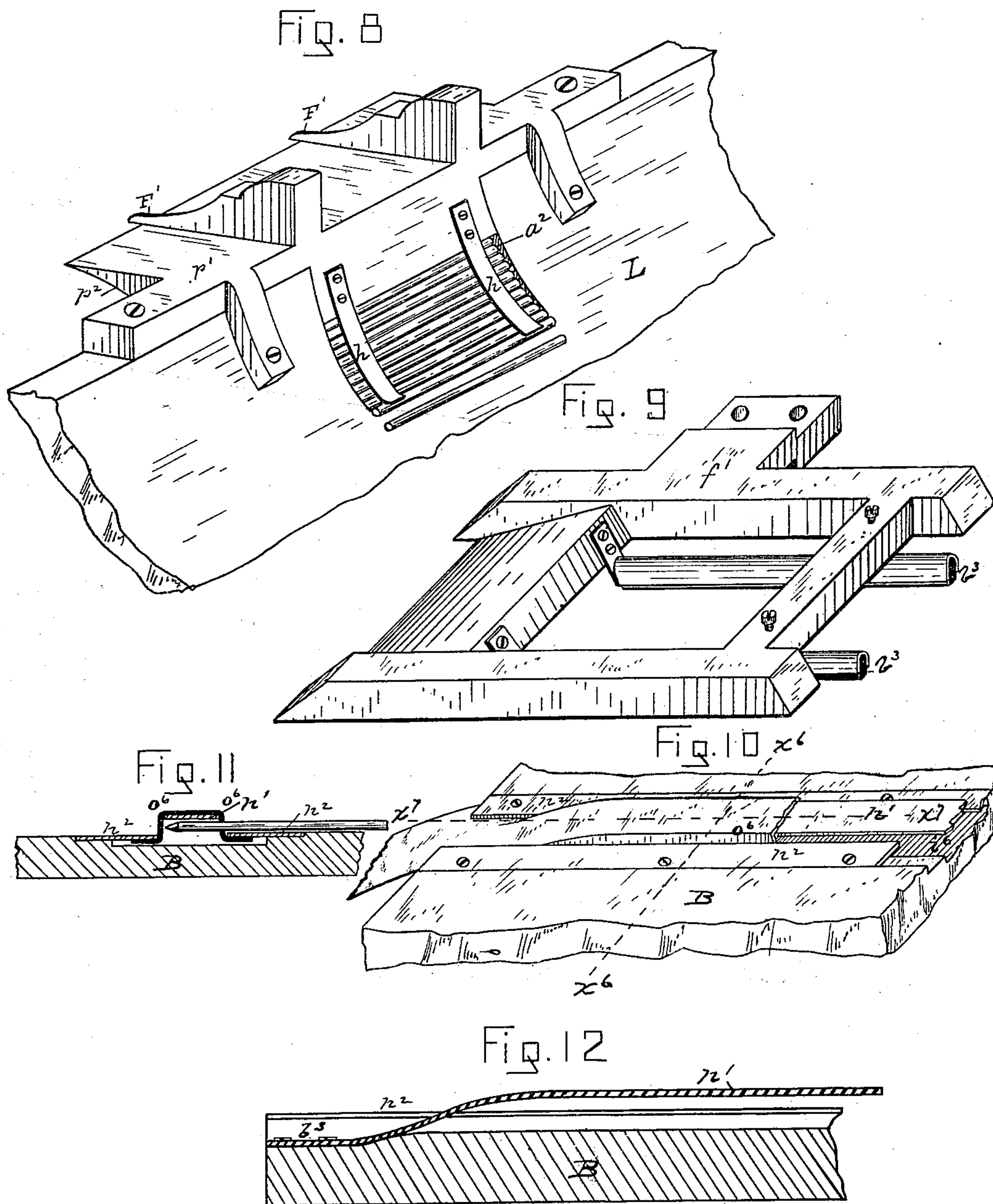
(No Model.)

5 Sheets—Sheet 5.

G. E. NORRIS & W. E. HAGAN.
MATCH MAKING MACHINE.

No. 332,737.

Patented Dec. 22, 1885.



WITNESSES:

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UNITED STATES PATENT OFFICE.

GEORGE E. NORRIS AND WILLIAM E. HAGAN, OF TROY, ASSIGNORS OF ONE-THIRD TO JAMES K. P. PINE, OF LANSINGBURGH, NEW YORK.

MATCH-MAKING MACHINE.

SPECIFICATION forming part of Letters Patent No. 332,737, dated December 22, 1885.

Application filed May 13, 1885. Serial No. 165,294. (No model.)

To all whom it may concern:

Be it known that we, GEORGE E. NORRIS and WILLIAM E. HAGAN, of the city of Troy, county of Rensselaer, State of New York, have
5 invented a new and useful Improvement in Machines for Making Matches, of which the following is a specification.

Our invention relates to certain attachments to machines for making match splints or
10 blanks, our improvements having for their object the insertion of the splints or blanks (as produced by the machine) within a web for dipping, and for other uses.

Our invention is more particularly adapted
15 to that class of machines by which the splints or blanks are cut from a veneer of wood by means of two rollers that are actuated to move together, and which are provided with grooves, and intermediate cutting-edges that are ar-
20 ranged coincidently in said rollers parallel to their axes, and as appearing in an application for Letters Patent made by us, and filed in the Patent Office February 13, 1885, and which is now pending.

25 Accompanying this specification, to form a part of it, there are five plates of drawings, containing fourteen figures, illustrating our invention, with the same designation of parts by letter-reference used in all of them.

30 Of these illustrations, Figure 1 is a perspective of a machine for making match-splints containing our invention, with that side of the machine on which the driving-pulley is placed and the delivery or front end of the machine turned toward the sight and the
35 driving-pulley removed. Fig. 2 is a perspective of the same machine that is shown at Fig. 1, but with that side of it which is opposite to the one on which the driving-pulley is placed and the front end of the machine turned to-
40 ward the sight. Fig. 3 is a longitudinal vertical section taken on the line $x'x'$ of Fig. 2. Fig. 4 is a vertical section taken on the line x^2x^2 of Fig. 3. Fig. 5 is a vertical section taken on the line x^3x^3 of Fig. 3, omitting the machine-bed and the chain belts. Fig. 6 is a
45 vertical section taken on the line x^4x^4 of Fig. 3. Fig. 7 is a vertical section of the shaft and sprocket-drum and the roller-shaft which
50 operate the chain belt that forces the splints into the web, with that stretch of the chain

which is adjacent to the web shown in side elevation, and that side of the sink in the machine-bed in which this chain belt is operated which is nearest to the web being also shown
55 in a side elevation to illustrate the relative position of the top of the chain and the machine-bed. Fig. 8 represents in perspective as detached the concavely-curved guide-plate, the fingers which strip the veneer from the
60 upper roller, the opening for the passage of the splints onto said plate, and the springs across said opening under which the splints pass. Fig. 9 designates as detached from the other mechanism the presser-frame, which,
65 when in position in the machine, is over the splints on the machine-bed, after they have passed out from under the rubber roller and from off the concavely-curved guide-plate. Fig. 10 is a perspective of a part of the machine-bed, part of the upper fold-plate, and
70 the side plates which position and shape the web to produce a longitudinal puncturing-fold therein, and showing also a part of the web threaded upon said plates. Fig. 11 is a
75 cross-section taken on the line x^6x^6 of Fig. 10. Fig. 12 is a longitudinal section taken on the line x^7x^7 of Fig. 10 and Fig. 13 is a view in perspective of a part of the lower cutting-rollers, and the fingers which strip the veneer from
80 off said roller. Fig. 14 is a longitudinal vertical section taken through the cutting and pressing rollers, their shafts, and connecting gear-wheels, taken on the line x^8x^8 of Fig. 3. Figs. 5, 6, 7, 8, 9, 10, and 11 are shown with
85 the parts in larger proportion than in Figs. 1 and 2.

The several parts of the mechanism thus illustrated are designated by letter-reference, and the function of the parts is described as
90 follows:

The letters R' and R^2 designate two cutting and pressing rollers that are of the same size, and which are constructed to be connected by the gear-wheels G' and G^2 , so as to move to-
95 gether, each of them being made with grooves g' and intermediately-placed cutting-edges e' , that are arranged in the cylindrical face of said rollers in lines that are parallel to their axes. These rollers have also two ring-form
100 grooves, g^2 , which are placed in the cylindrical face of each roller, so as to be vertically

parallel in both of them when they are in position one above the other in the machine.

The letter I designates a rubber roller arranged on a shaft having its bearings in the machine-frame F⁶, said rubber roller being provided with a groove, a⁴, made in revolution in its cylindrical face at each end to carry thereat an endless conveying chain belt, C'.

The letter L indicates a concavely-curved guide-plate that rests on the machine-frame, and the concave thereon is made to curve coincidentally to the face of the rubber roller I, but to be far enough away from it to leave a passage-way, O, for the movement therein of the splints as they are drawn along over the concave by the two conveying chain belts C' and their engagement with the cylindrical face of the rubber roller I. This concavely-curved guide-plate is made to have an opening, a², provided with two downwardly-projected leaf-springs, h h, from underneath the lower ends of which the splints pass onto the concave.

The letter F' indicates two fingers arranged on a plate, p', which are adapted to enter the ring-form grooves of the upper roller, R', to underrun and to strip the adhering veneer of partly-cut splints therefrom when at the bottom of the roller, from whence they pass downwardly through a passage-way, d, formed between the lower roller and the concave surface p² on the back of the concavely-curved guide-plate L. The splints are stripped from off the side of the lower roller, R², by two fingers, F², that are attached to the back of the guide-plate L, and adapted to enter the ring-form grooves of said lower roller. From thence the splints are forced through an opening, a², on the guide-plate L, when the ends of each splint are caught by the recesses r', oppositely made in the outer face of the conveying chain-links, and carried down along over the concave surface of the guide-plate L and along over the bed B.

The letter D indicates a drum arranged on a horizontal shaft, S'. W⁴ designates a gear-wheel on the said shaft, which receives power from a gear-wheel, W², and communicates motion to said shaft S' and the drum D arranged thereon. The drum D has two sprocket-grooves, d⁴, in revolution thereon, each of which is adapted to communicate motion to one of the endless conveying-chains C' C'. These conveying-chains run in the drums D, and in grooves a⁴ in revolution on the rubber roller I.

The letter M designates a roll of paper forming the web, into which the splints are inserted crosswise, so as to pass twice through the web to include an intermediate outfold made therein longitudinally. This web M is arranged to have a shaft, v', passed through it centrally, and which shaft is made to be inserted in or removed from open-top bearings arranged at the sides of the roll. The web is drawn into and through the machine by means of two rubber rollers, I² I², located at the de-

livery end of the machine, that are arranged to run with their surfaces in an impressed contact by means of set-screws t, arranged in the journal-boxes of the upper one of the rollers I², and during its passage through the machine the web is caused to pass over a fold-plate, n'. This fold-plate is attached to the machine-bed B at b³, and from where attached to the machine it rises a short distance from the bed, and from thence is extended frontward nearly to the rubber roller I², in a line horizontally parallel to the machine-bed. While the raised center of the web is thus passing over the raised fold-plate n', with the side edges of the web in a lower plane beneath the adjacent side edges of the plates n² n², two puncture fold-lines, O⁶ O⁶, are produced in the web, one of them being at each side of the plate n', and through which a splint may be forced crosswise or pinned into the web, with the central part of each of the splints within the fold where raised, and the opposite ends of the splints projected therefrom, as shown at m⁶ of Figs. 1 and 2. The fold-plate n' and the plates n² are arranged on the machine-bed at one side of the line of the traverse made by the belt-conveying chains C', with the machine-bed on the line of the said plates recessed, as indicated at i⁶ of Fig. 10.

The letters C² indicate an endless-chain belt, the function of which is to force the splints laterally crosswise into the web, and this chain belt is arranged to be operated by a drum, d², provided with sprocket-teeth and to run on a roller, d³, having a vertical shaft, S³, the drum d² having a vertical shaft, S². This vertical shaft S² receives power from a beveled gear-wheel, g⁴, on its upper end, which meshes into a beveled gear-wheel, g⁶, on the shaft S'. The vertical shafts S² and S³, on and by which the chain belt C² is operated, are arranged in a line that makes an acute angle with the line of direction in which the web moves, and the said chain belt is so operated that the stretch of the latter which is adjacent to the splints, moves toward the delivery end of the machine, with the top of the chain belt C² just above the adjacent part of the bed B, the body of the chain belt being arranged to run in a sink, Y, made in the machine-bed. As thus arranged, with the web and the endless-chain belt C² moving at the same speed, when each of the recesses i, made in the outer face of the links composing the belt-chain C², comes in contact with the adjacent end of each one of the splints as they are being moved by the chains C'. While leaving the latter the chain C² pushes the splints laterally as they move forward, so that they will pass through the upfold made in the web where at each side of the plate n', and where indicated at O⁶, as shown at Figs. 1, 2, and 11, and by which the splints are inserted in the web, and by the latter are carried out of the machine, as indicated at m⁶. As the splints are being moved over the bed B horizontally, they are held down on the latter by the pressing-frame f', arranged over them between the rubber roller

I' and the shaft S'. The letters v^3 designate bars of rubber arranged on the bottom of the frame f' , which are in contact with the passing splints. By means of the endless chains C' on each side of the rubber roller the splints at their ends are caught by recesses in the chain-links, while the rubber-roller face is in contact with them between the said chains, and rolls them along over the concave on the guide-plate L, to clean them of adhering fiber, the ends of the splints turning in the recesses formed in the links of the conveying chains while this is being done.

The method of cutting the splints by means of the two cutting and pressing rollers R' and R², the method of stripping the splints from off the rollers, excepting as herein shown to be modified, when compared with our older application before named, and the application of the rubber roller I arranged to operate in connection with the concavely-curved guide plate L, excepting as said roller is constructed to operate the conveying-chains C', and said guideway is constructed with an opening, a^2 , form no part of the invention made the subject of claim herein, excepting as they are connected with the means added to put the splints into a dipping-web, and hence are not described in detail.

The cutting-rollers are operated by the power applied to a connecting gear-wheel on the shaft of the lower cutting-roller, R², and by a gear-wheel on the latter power is communicated to gear-wheel G² on the upper roller-shaft.

To operate the rubber roller I, power is applied to a gear-wheel, W⁵, on the rubber-roller shaft.

To operate the shaft S', on which the drum D is placed, and which, in connection with the rubber roller I, operates the conveying-belt chains C', power is applied to the gear-wheel W⁴ on the end of the shaft S', and the shaft S' has a gear-wheel, W⁸, on the end opposite to that at which it receives power, and this meshes into a wheel, W⁵, and the latter into a wheel, W⁷, that actuates a wheel, W⁶, on the shaft S⁵, which operates the rubber rollers I².

Any form of geared connection of the parts may be used that will move the conveying-belt chains C', so that on their lower stretch they will move toward the front of the machine, and at the same speed as the web moving in the same direction, and any form of arrangement of geared connection that will also move the puncturing chain belt, so that it will have the same speed as the conveying-chains and the web, may be used.

The function of the endless-chain belts C' being to receive the matches when passing through the opening a^2 made in the curved guide-plate, and to keep them at a proper distance from each other, any form of recess may be used in the chain which will perform the same function; and the function of the endless-chain belt C² being to communicate lateral motion to a line of moving splints, so as to force them into a web moving in the

same direction, any form of chain and recess may be used that will perform the same function in substantially the same manner.

Having thus described our invention, what we claim, and desire to secure by Letter Patent, is—

1. The combination, with the splint cutting and pressing rollers R' and R², each having the circumferentially-arranged grooves g^2 , and connected by gears to move together, of the fingers F', constructed to enter said grooves of the upper roller, R', to strip the splints from off the bottom of the latter, the fingers F², arranged to enter the said circumferential grooves of the lower roller, R², to strip the splints from the side of the latter, and the concavely-curved guide-plate L, made with the passage a^2 , substantially in the manner as and for the purposes set forth.

2. The combination of the concavely-curved guide-plate L, made with the opening a^2 , the rubber roller I, made with the grooves a^4 , and arranged with reference to said guide-plate substantially as shown, the drum D, arranged on the shaft S', the endless conveying chain belts C', and the bed B, said parts being constructed and arranged to operate substantially in the manner set forth.

3. The combination, with the bed B, of the endless chains C' C', constructed to be actuated by the roller I and drum D, substantially as described, the web M, having a longitudinally and centrally arranged upfold, the rollers I² I², constructed to draw said web through the mechanism, and the endless-chain belt C², constructed to be actuated by the sprocket-drum d^2 and roller d^3 relative to the traverse of said chain C' and the said web, substantially in the manner as and for the purposes set forth.

4. The combination of the fold-plate n' , made to curve upwardly from where attached at the rear of the machine-bed, as shown, and therefrom extended frontwardly in a line horizontally parallel with but above the machine-bed, the side fold-plates, n^2 n^2 , each of which is arranged over and above the bed, but below and at one side of the said plate n' , substantially as shown, and the endless-chain belt C², operated by means of a vertical sprocket drum and roller with the stretch of said chain belt that is adjacent to the said fold-plates, making an acute angle with the latter and moving thereat toward the delivery end of the machine, as and for the purposes set forth.

5. The combination, with the bed B, of the conveying-chains C' C', constructed to be operated by the roller I and drum D, substantially as described, the presser-frame f' , having the rubber strips v^3 , the web M, having a longitudinally and centrally arranged upfold, the rollers I² I², and the endless chain C², actuated by the sprocket-drum d^2 and roller d^3 , all substantially in the manner as and for the purposes set forth.

6. The combination, with the bed B, of the

web M, having a centrally and longitudinally
arranged upfold made therein, the rollers I²,
constructed to move said web, and the endless-
chain belt C², arranged to be actuated by the
5 drum d² and roller d³, to move relatively to
the traverse of said web, substantially in the
manner as and for the purposes set forth.

Signed at the city of Troy, New York, this

27th day of April, 1885, and in the presence
of the two witnesses whose names were by 10
them hereto written.

GEORGE E. NORRIS.
WILLIAM E. HAGAN.

Witnesses:

CHARLES S. BRINTNALL,
STANLEY M. HOLDEN.