

No. 798,204.

PATENTED AUG. 29, 1905.

J. F. NELSON.
STOCKING PRESSING MACHINE.

APPLICATION FILED MAY 4, 1903.

6 SHEETS—SHEET 1.

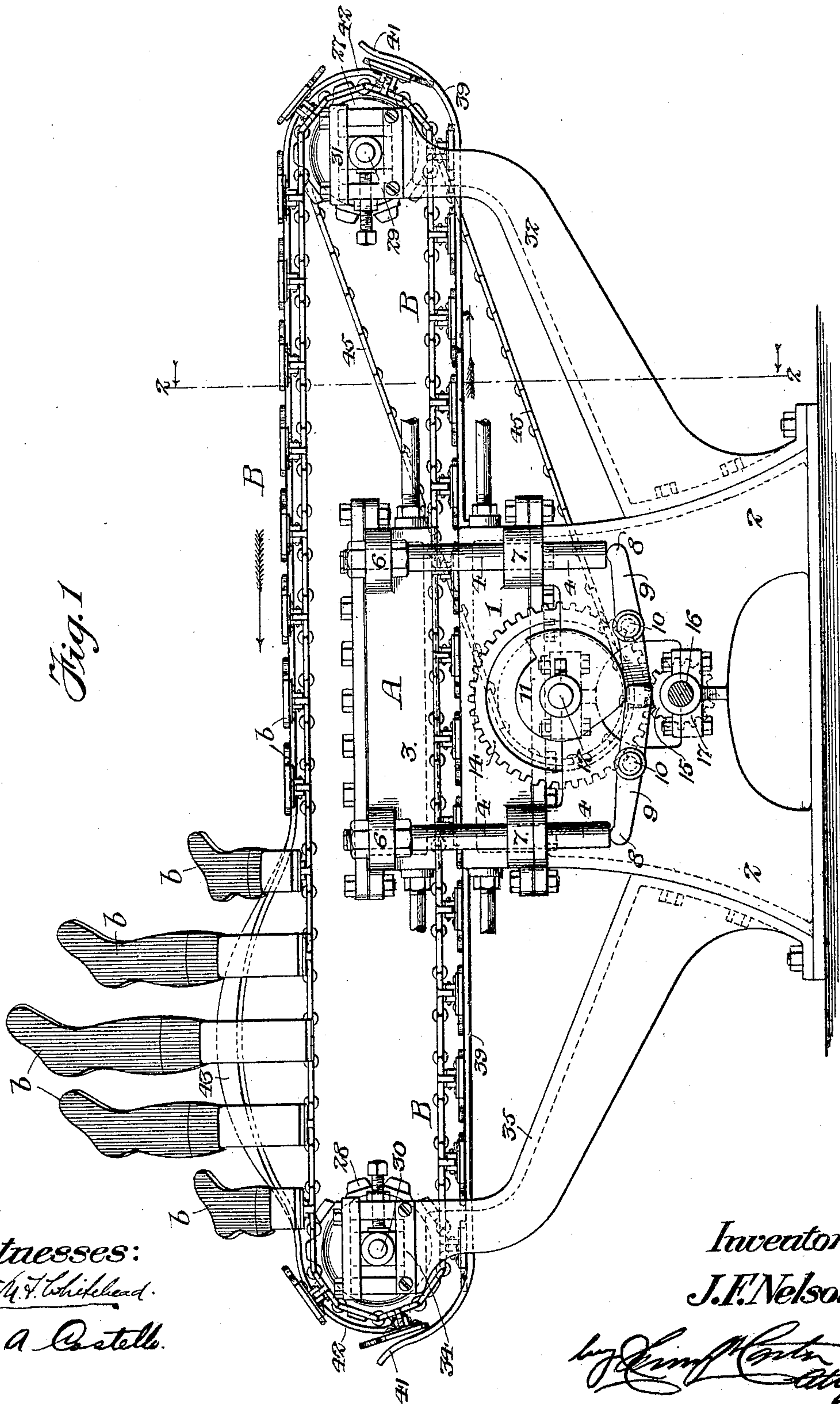


Fig. 1

Witnesses:
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H. A. Costello.

Inventor
J. F. Nelson.

by [Signature] Atty.

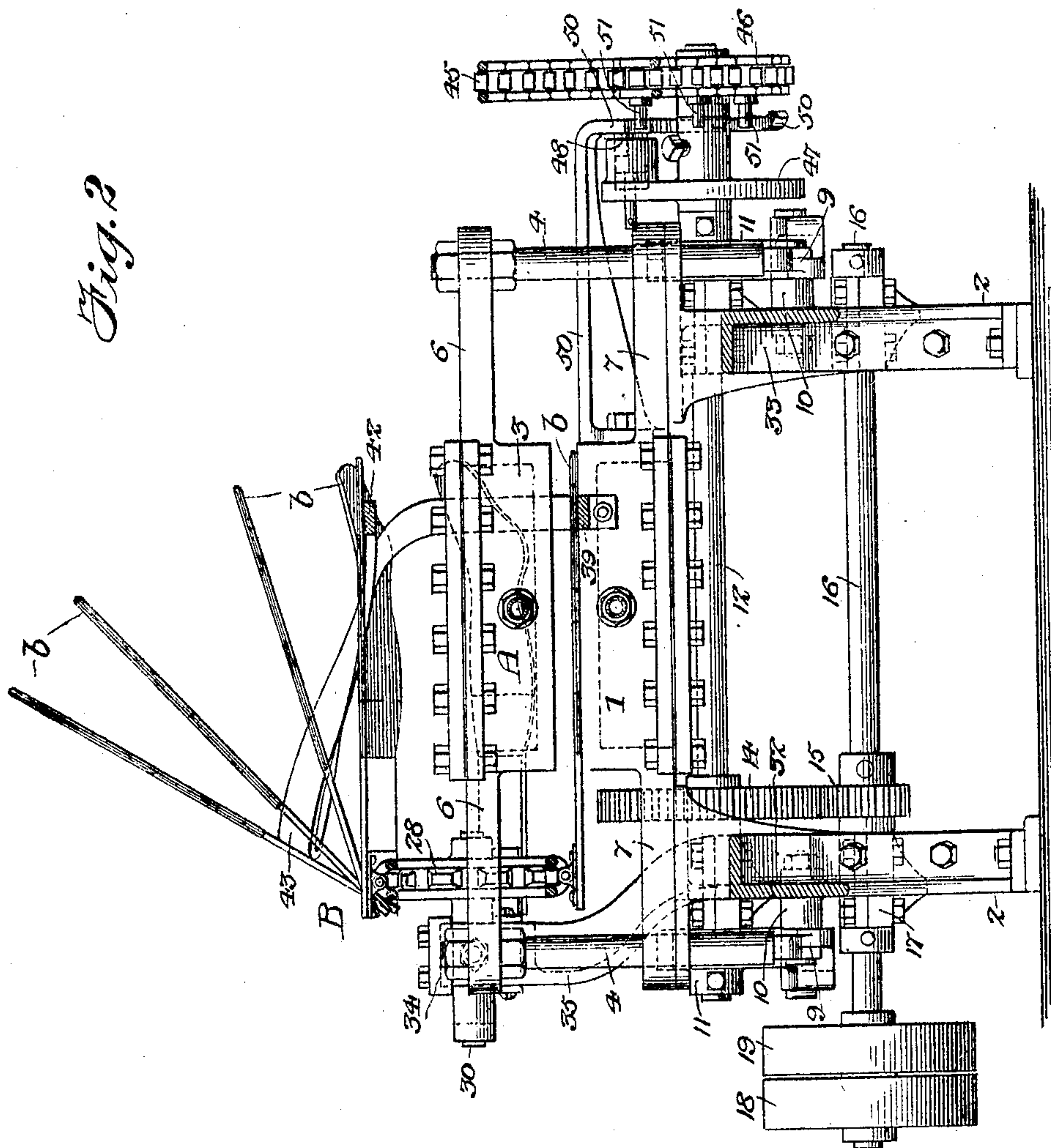
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Witnesses:

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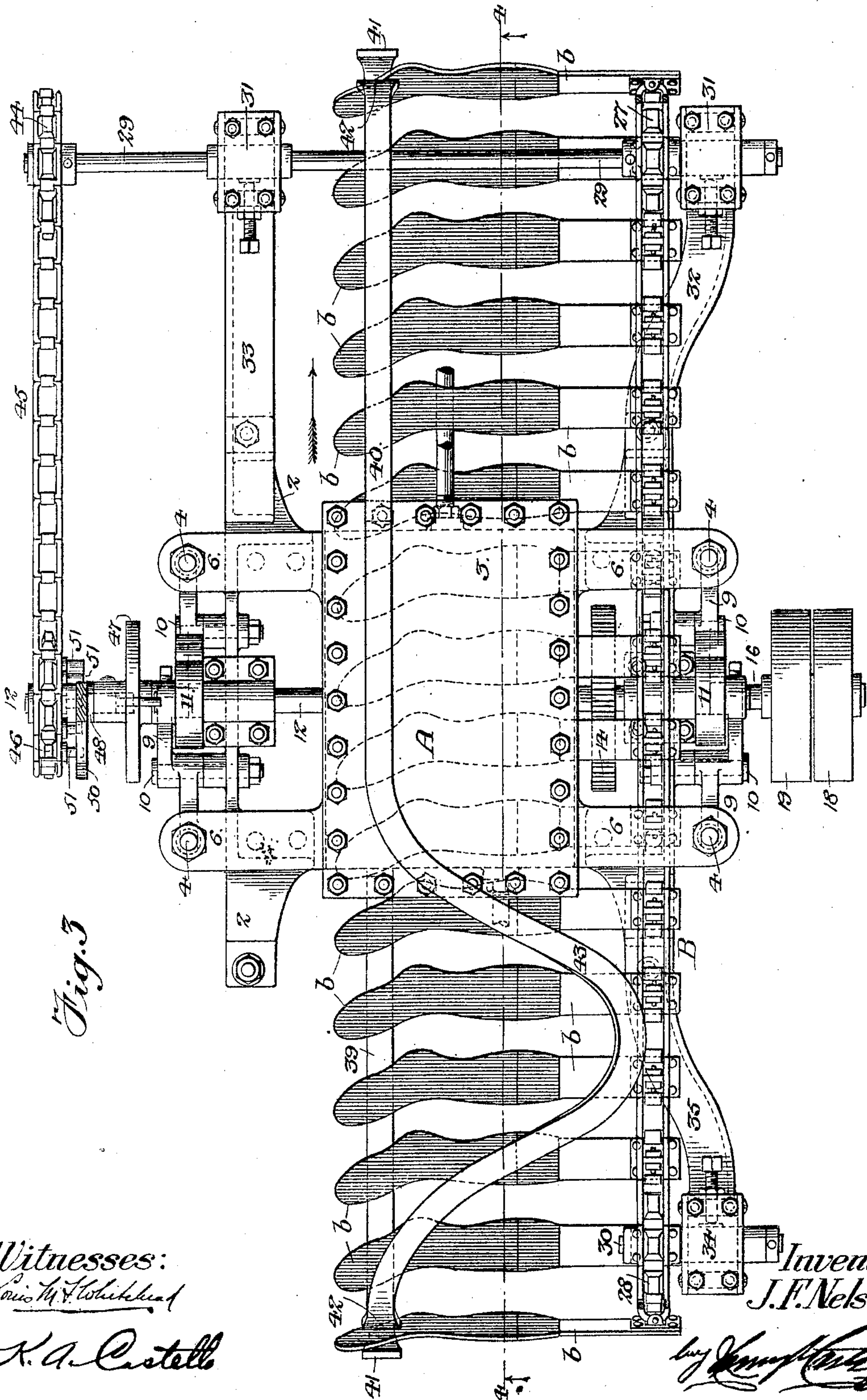
Lucy Thompson

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6 SHEETS—SHEET 3.



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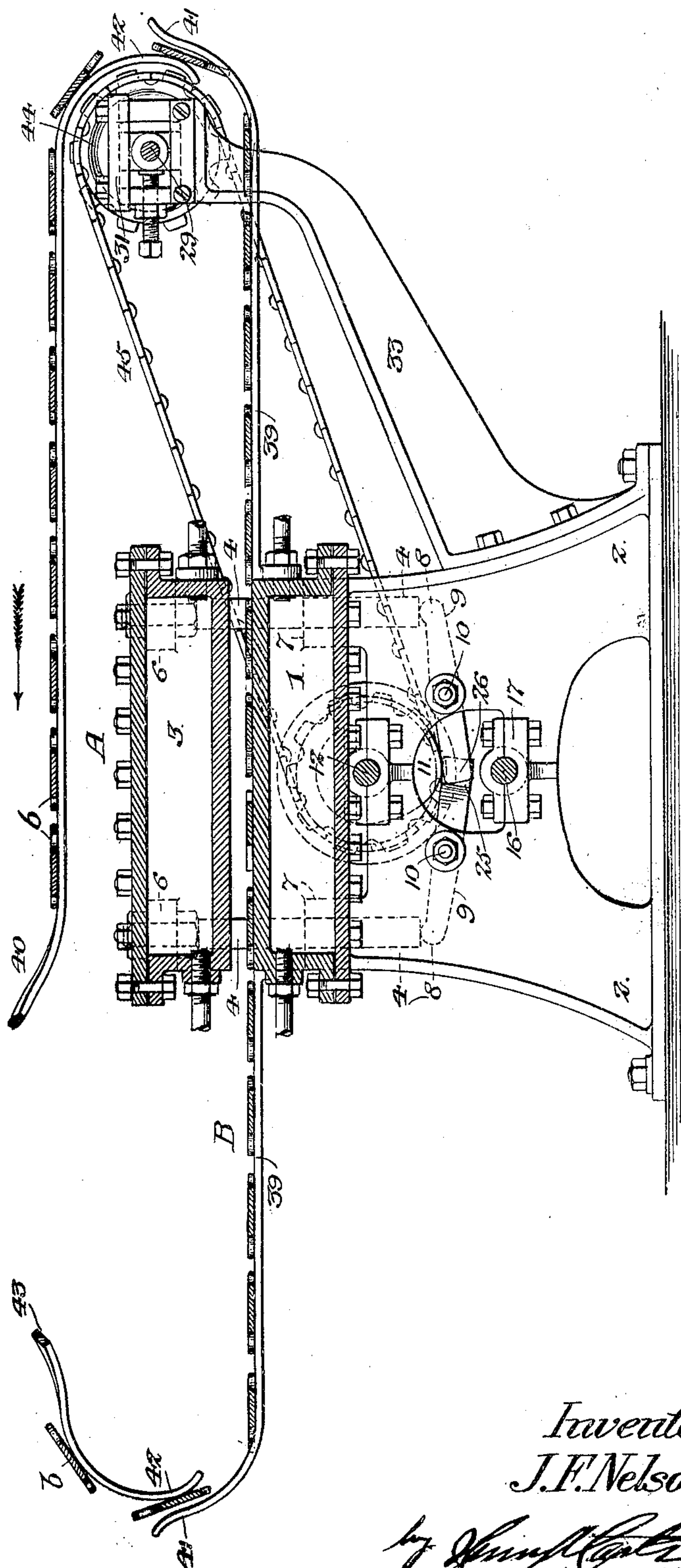
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6 SHEETS—SHEET 4.

Fig. 4



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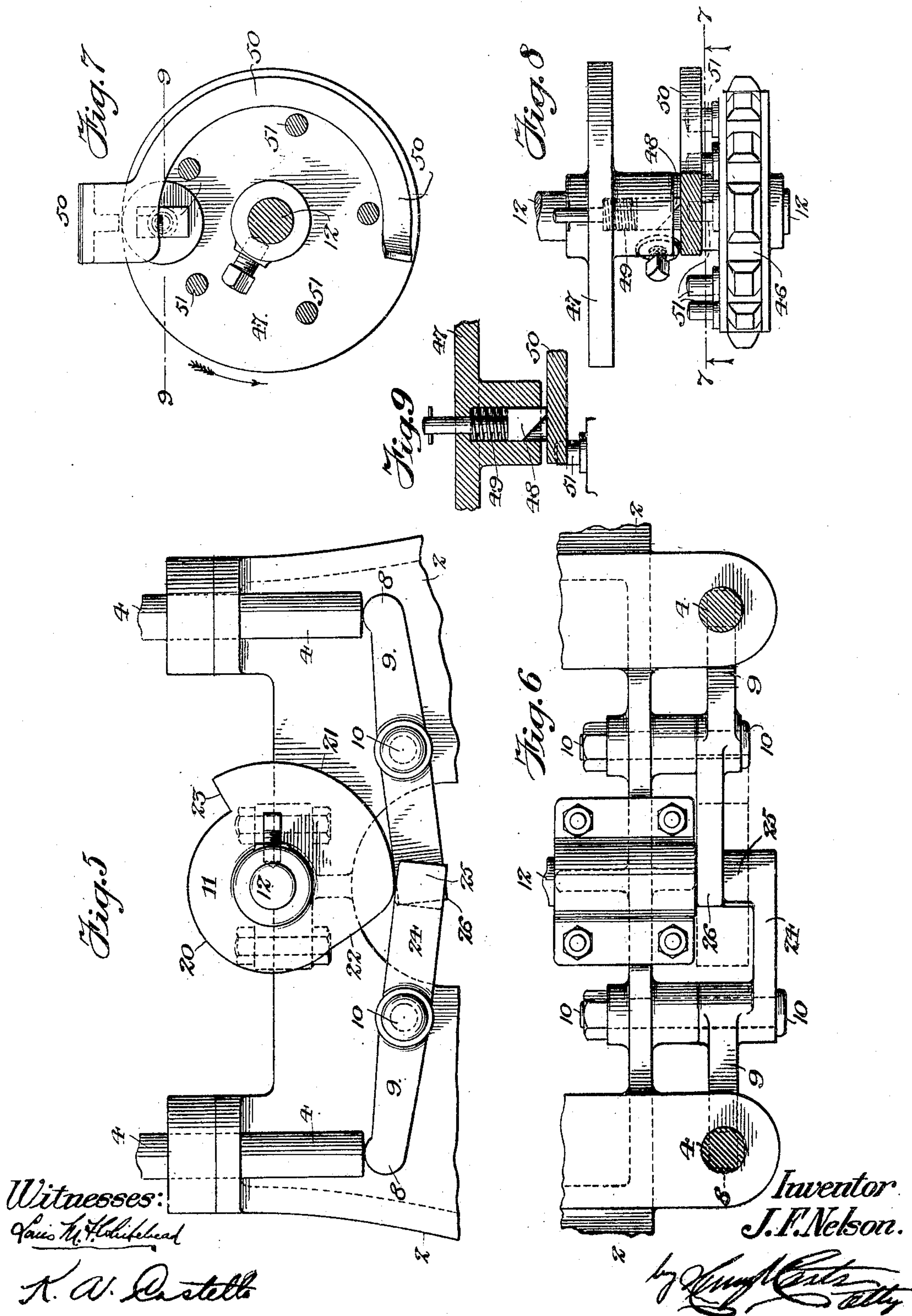
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6 SHEETS—SHEET 5.

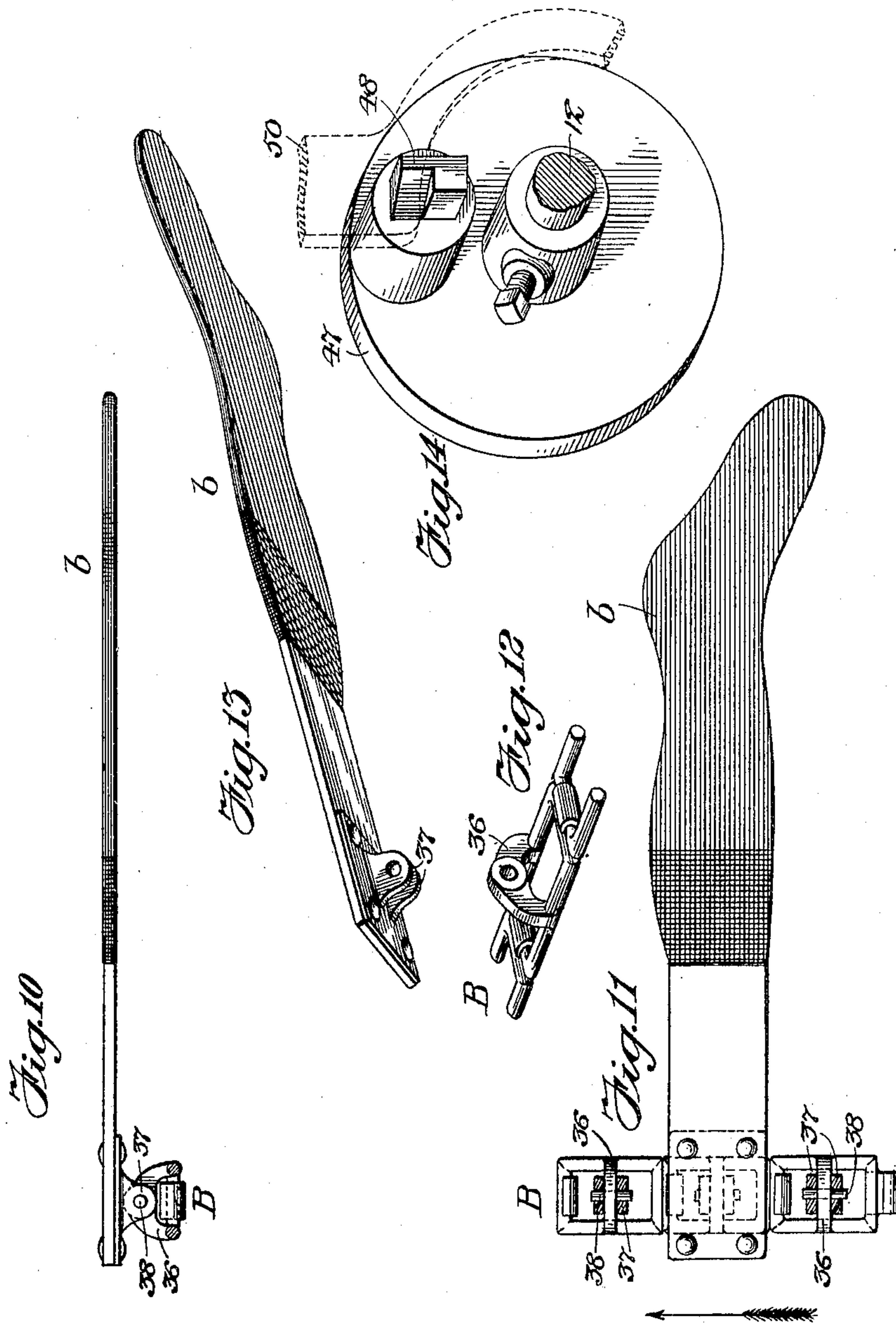


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6 SHEETS—SHEET 6.



Witnesses:

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UNITED STATES PATENT OFFICE.

JOHN FRANKLIN NELSON, OF ROCKFORD, ILLINOIS, ASSIGNOR TO
FOREST CITY KNITTING MILLS, OF ROCKFORD, ILLINOIS.

STOCKING-PRESSING MACHINE.

No. 798,204.

Specification of Letters Patent.

Patented Aug. 29, 1905.

Application filed May 4, 1903. Serial No. 155,697.

To all whom it may concern:

Be it known that I, JOHN FRANKLIN NELSON, a citizen of the United States, residing at Rockford, in the county of Winnebago and State of Illinois, have invented certain new and useful Improvements in Stocking-Pressing Machines, of which the following is a specification.

In the manufacture of stockings and the like it is customary to prepare them for the market after being knitted by putting them through a heated press, by which the wrinkles are removed and the stockings smoothed down preparatory to packing and shipping them. As heretofore commonly practiced this pressing is accomplished by drawing each stocking over a board or form which is cut to the proper shape and then inserting several such boards one at a time in an ordinary steam-heated press, which is then closed down upon them for whatever time is considered necessary to complete the pressing operation. At the end of this time the press is opened and the stockings are removed one at a time as they were inserted, so that on being then drawn from the forms they possess that smoothness and shapeliness which the market demands. The present invention has in contemplation a machine for accomplishing the same result automatically and by what amounts, in effect, to a continuous operation, requiring of the attendant only that he shall withdraw the pressed stockings from the forms and replace them with fresh stock.

One form of machine embodying my invention may embrace, for example, a press which opens and closes automatically and at intervals and a carrier mounted in proximity to the press and adapted to convey the stocking-carrying forms into and through the press as the latter opens and closes. Broadly speaking, the traveling carrier may be of any suitable design and construction—as, for example, a rotary part having stocking-receiving forms which radiate from it like the spokes of a wheel and which are carried through the press in succession as the carrier rotates. Preferably and as herein shown, however, such carrier takes the form of an endless chain or belt having stocking-receiving forms which project at right angles to the path of movement of the carrier and in such relation to the press that they will be moved through the latter in turn as the carrier is moved.

The press itself may have its bed and platen pivotally connected, as by a hinge, so that it opens and closes with a swinging movement, or may have its platen arranged to reciprocate bodily toward and from the bed, and in either case means will desirably be provided for opening and closing the press at regular intervals and with whatever dwell may be necessary at the times when the press is fully opened and when it is closed. Desirably, also, the endless carrier will be automatically actuated so as to carry its form-boards in succession through the press, and in the approved construction driving means are provided in connection with the devices for opening and closing the press, so that the carrier automatically moves along each time the press is opened and comes to a standstill for the moment each time the press is closed. In this manner the stockings to be finished are advanced into and pass through the press by a series of hitches or steps which will ordinarily be so proportioned with reference to the length of the press that each stocking in turn will be subjected to the closing pressure of the press more than once between its entering and leaving the press. In the approved construction more particularly herein set forth the carrier movement will also automatically cause the forms to be tilted up as they pass the attendant's station in such manner as to enable him to most conveniently remove and replace the stockings on the forms.

The object of my invention is to provide an improved construction in machines of the character referred to; and it consists in the matters hereinafter set forth, and particularly pointed out in the appended claims.

In the accompanying drawings, Figure 1 is a side elevation of one form of stocking-pressing machine constructed in accordance with my improvements. Fig. 2 is a sectional end elevation taken on line 2 2 of Fig. 1. Fig. 3 is a top plan view thereof, with the carrier in section, so that only the lower line of stocking-receiving forms is shown. Fig. 4 is a longitudinal sectional elevation taken on line 4 4 of Fig. 3. Figs. 5 and 6 are details of the cam mechanism for raising and lowering the platen. Fig. 7 is a detail of the automatic clutch for intermittingly driving the carrier, taken on line 7 7 of Fig. 8. Fig. 8 is a top plan view of the same part. Fig. 9 is a sectional detail of the spring-catch of the mechanism, taken on line 9 9 of Fig. 7. Figs. 10,

11, 12, and 13 are details of the endless carrier. Fig. 14 is a perspective detail of the same clutch part shown in Fig. 7.

The press.—In said drawings, A designates the press as a whole, and B the endless carrier by which the forms *b* are carried in succession through the press. As herein shown the press A consists of a bed 1, carried by heavy supporting-legs 2, and a vertically-reciprocating platen 3, mounted directly above the bed and held in exact but movable relation thereto by guide-rods 4. Both the bed and platen will ordinarily be made hollow and provided with steam connections S, by which they may be kept as hot as may be desired. In connecting the steam-pipes with the press provision will be made for the necessary movement of the platen; but the character of the connection is otherwise unimportant and is accordingly not here illustrated. The guide-rods 4 are shown as bolted to the outer ends of projecting arms or brackets 6 of the platen and extend thence downwardly through apertures in similar arms or brackets 7 of the bed of the press until they rest upon the outer extremities 8 of lifting-levers 9, that are pivoted at 10 to the supporting-legs 2 of the press. The lifting-levers 9 are provided in pairs at each end of the press and are arranged to be oscillated by cams 11, located at each end of the press upon a common shaft 12, which constitutes the main driving-shaft of the machine. As herein shown the shaft 12 is provided with a gear 14, which intermeshes with a gear 15 on a counter-shaft 16. This latter is journaled in bearings 17 on the legs 2 some distance beneath the shaft 12 and is shown as provided at one end with the usual tight and loose pulleys 18 and 19, to which an ordinary driving-belt can be applied in a familiar manner. The shape of the cams 11 is desirably made such that they gradually raise the platen of the press to its highest point, maintain it thus at full opening for a predetermined period, and then let it fall suddenly upon the stockings on the forms within the press. To this end each cam comprises two concentric portions 20 and 21 of different radii connected on one side by an irregular-curved portion 22 and on the other by an abrupt radial shoulder 23. The ends of the levers 9 at each end of the press are brought together directly beneath the cam 11 and are operated upon alike and simultaneously by the cam, this action being brought about by offsetting the inner end 24 of one of the levers 9 until it clears the cam, Fig. 6, and then providing it with an inturned lug 25, which projects under the cam exactly in line with the inner end 26 of the other lever 9, which extends straight under the cam. Then when the cam is rotated in the direction indicated in Fig. 5 the inner ends of the two levers will be gradually forced down, thus raising the platen until the shoulder 23 of the cam passes the ends of

the lever, whereupon they suddenly drop back together and let the platen fall abruptly upon the bed of the press.

The carrier mechanism.—The carrier employed in this instance is of the endless-belt variety and consists, as herein shown, of a single link belt or chain B, to which the forms *b* are attached at intervals throughout its length. This belt B is carried by sprocket-wheels 27 and 28, mounted on shafts 29 and 30, that are arranged parallel to the driving-shaft 12 some distance from the sides of the press and at about the level of its top. As herein shown the shaft 29, which constitutes the driving-shaft of the carrier, is supported in bearings 31 on laterally and upwardly projecting bracket-arms 32 and 33, that are bolted to the foot of the press, Fig. 1, while the shaft 30, which merely supports the sprocket 28, is mounted in a bearing 34 at the end of a bracket-arm 35, bolted to the foot of the frame on the opposite side from the arm 32. The lower stretch of the belt B is arranged to extend through the space at one end of the press between the press proper and the guide-rods 4 and between the upper and lower bracket-arms 6 and 7, through which the guide-rods are passed, Fig. 2, its upper stretch extending in a parallel direction, but at a level above the top of the press. The forms *b* are secured to the belt B to project at right angles from it toward the press proper, so that in traveling across the lower stretch of the belt they are carried through the press between its bed and platen, Fig. 2. The forms are desirably mounted on the chain as close together as they conveniently can be without interfering with each other and are herein shown as secured to every other link of the belt. Any suitable construction of link may be employed, and as herein shown each alternate link is provided about midway of its length with a transverse bridge-piece 36 and each form *b* with a pair of lugs 37, which embrace the bridge 36 and are secured thereto by a pivot-pin 38. This not only secures the forms to the links in such manner as to maintain their proper right-angular relation to the length of the belt, but enables them to be swung up on the pivots 38 to permit the stockings to be conveniently slipped over their free ends as they pass the attendant.

A guide 39 is provided on each side of the press at the level of the press-bed, Fig. 1, and serves to guide the forms into and out of the press during their movement along the lower reach of the chain. Another guide 40 extends the full length of the chain above the press and serves to guide the forms throughout their travel along the upper reach of the chain. The ends 41 of the lower guides are turned up, and the ends 42 of the upper guides are turned down opposite the places where the chain passes around the sprocket, and the forms slide smoothly from their engagement

with one guide to their engagement with the other without being at any time free from proper control. At one side of the press, also, the upper guide 40 is curved upwardly, as shown at 43, Figs. 1, 2, and 3, in such manner that the forms *b* are tilted on their pivots as they pass this portion of the guide, and this exposes the free end of each form in turn in the most convenient manner to enable an attendant standing beside the carrier to slip off the pressed stocking and draw on the new stocking to be pressed with greatest celerity. After passing the point at which the attendant thus replaces the stocking the forms will gradually swing back into their normal horizontal position and pass on around to enter the press without further attention.

In the approved form of my invention herein shown the carrier is designed to be positively driven by an intermittent movement corresponding with the intermittent movement of the press, the carrier being held stationary while the press is closed upon the stockings. To this end the carrier-driving shaft 29 is provided with a sprocket-wheel 44 and is connected by a sprocket-chain 45 with a corresponding sprocket-wheel 46 on the end of the main driving-shaft 12 of the press. The sprocket 46 is, however, only loosely mounted on the shaft and is driven by intermittent connection with a driving-disk 47, that is rigidly mounted on the shaft adjacent to the sprocket 46. This disk is provided with a driving-dog 48, which is normally projected from its socket by a spring 49, Fig. 9, but is adapted to be pressed back into its socket during a portion of each revolution of the disk by a cam-guide 50. The sprocket 46, on the other hand, is provided with one or more pins or lugs 51, which project toward the disk 47 into position to be engaged by the driving-dog 48 when the latter is not repressed by the cam-guide, Figs. 7 and 8.

In the operation of the machine the driving-dog 48 takes hold of one of the pins 51 just after the curved surface 22 of the cam begins to force down the inner ends of the levers 9 to raise the platen of the press, with the result that the carrier begins to move as soon as the platen is lifted from the stockings that lie for the time being within the press, and the dog continues to drive the carrier through this pin 51 until the dog strikes the end 52 of the cam-guide 50 and is forced in beneath the guide until it releases the pin. This release occurs just before the abrupt shoulder 23 of the cam passes over the inner ends of the levers 9 and permits the platen of the press to drop, and thereupon the carrier is relieved of its driving impetus and remains stationary until the dog 48 passes from beneath the cam-guide again and springs out to engage another of the pins 51, which by the previous movement will have been carried

into position to be engaged by the dog at this time. To avoid interference between the pins 51 and the cam-guide, the latter is placed just outside the path of these pins, and the dog 48 is made deep enough radially to contact with both the guide and the pins in turn. The outer advancing corner 53 of the dog is furthermore beveled off like an ordinary door-latch, so as to smoothly engage the cam-guide and cause the dog to be forced back without undue resistance and jar. In this manner the carrier is advanced a determinate distance during each revolution of the cam-shaft and while the platen of the press is being lifted or held in its raised position, and the extent of such advance movement of the carrier depends upon the length of the cam-guide 50 and the relative sizes of the several sprocket-wheels of the carrier mechanism. As herein shown, these sprocket-wheels are all of equal size, and the cam-guide is of such length as to keep the dog 48 repressed during two-fifths of a revolution, five pins being provided on the sprocket 46, so that one of these pins is always in position to be engaged by the dog when the latter springs out from beneath the cam-guide 50. This allows the carrier to be moved during three-fifths of each revolution of the shaft, and inasmuch as the carrier-sprockets 27 and 28 are each provided with ten teeth and the forms *b* attached to every other link each carrier movement will be equal in length to the space occupied by two stockings. In other words, the number of stockings leaving and entering the press each time it opens will in this case be two, and with a length of press sufficient to hold four stockings, as in the machine herein illustrated, each stocking will be twice subjected to pressure between its entering and emerging from the press. Obviously, however, it could be readily arranged to move but a single stocking in and out of the press each time it opened, in which case each stocking would be several times subjected to pressure, or, on the other hand, it might be arranged to move the carrier along the full length of the press each time, in which case the stockings would be subjected to pressure but once.

The shape of the cam 11 employed in the particular machine herein set forth causes the pressure to be exerted in a sudden blow, which seems to accomplish the desired pressing action better than a pressure gradually applied and to decrease the length of time which is necessary to maintain the press closed upon the stockings. Other forms of cam involving a gradual application of the pressure may be used, however, and if found necessary or desirable they may be arranged to force the platen positively against the bed instead of merely allowing it to engage the bed by its own weight. It will also be understood that numerous changes may be made in the

various details of the construction shown without departure from the broad spirit of the invention claimed.

I claim as my invention—

5 1. A stocking-pressing machine comprising a press consisting of a bed and platen, a movable carrier mounted in proximity to the press, stocking-receiving forms mounted on the carrier in position to be moved through the press
10 by the movement of the carrier, means for opening and closing the press, and means for moving the carrier intermittently and while the press is open.

2. A stocking-pressing machine comprising
15 a press consisting of a bed and platen, a plurality of stocking-receiving forms, means for opening and closing the press, and means for intermittently feeding said forms into and out of the press as the latter is opened.

20 3. A stocking-pressing machine comprising a press, a movable carrier mounted in proximity to the press, and stocking-receiving forms mounted on the carrier in position to be moved through the press by the movement of the carrier, substantially as described.

4. A stocking-pressing machine comprising a press, a movable carrier mounted in proximity to the press, and stocking-receiving forms projecting from the carrier in position to be
30 carried through the press by the movement of the carrier, substantially as described.

5. A stocking-pressing machine comprising a press, an endless carrier extending in proximity to the press and stocking-receiving
35 forms projecting from the belt in position to be carried through the press by the movement of the belt, substantially as described.

6. A stocking-pressing machine comprising a press, a movable carrier mounted in proximity to the press, and stocking-receiving
40 forms pivotally secured to and projecting from the carrier in position to be carried through the press by the movement of the carrier, substantially as described.

45 7. A stocking-pressing machine comprising a press, an endless carrier extending along one side of the press, and stocking-receiving forms pivotally secured to and projecting from the belt in position to be carried through the press
50 by the movement of the belt, substantially as described.

8. A stocking-pressing machine comprising a press, a movable carrier mounted in proximity to the press, and stocking-receiving forms
55 pivotally secured to the carrier in position to be carried through the press by the carrier movement, and means for tilting the forms upon their pivots to expose their free ends for the removing and replacing of the stockings, substantially as described.

9. A stocking-pressing machine comprising a press, an endless carrier in proximity to the press, stocking-receiving forms pivotally secured to the carrier in position to be carried
65 through the press by the movement of the carrier, and means for tilting the forms upon their pivots to expose their free ends for the removing and replacing of the stockings, substantially as described.

10. A stocking-pressing machine comprising a press, a moving carrier mounted in proximity to the press, and stocking-receiving forms pivotally secured to the carrier in position to be carried through the press by the carrier movement, and a guide engaging the
75 forms outside of the press to tilt them upon their pivots and expose their free ends, substantially as described.

11. A stocking-pressing machine comprising a press, an endless carrier mounted in proximity to the press, stocking-receiving forms pivotally secured to the carrier in position to be carried through the press by the movement of the carrier, a guide extending along the carrier and engaging the forms, and a curved
85 portion in said guide for temporarily tilting the forms upon their pivots and permitting them to resume their normal position with respect to the carrier and press, substantially as described.

12. A stocking-pressing machine comprising a press, a stocking-carrier, stocking-receiving forms mounted on the carrier and passing through the press, mechanisms for automatically opening the press at intervals, and connected mechanism for automatically moving the carrier at intervals as the press is opened,
90 substantially as described.

13. A stocking-pressing machine comprising a press, means for opening and closing the
100 press at intervals, including a driving-shaft, a stocking-carrier passing through the press, a yielding dog mounted to rotate with the shaft, a carrier-driving wheel loosely mounted on the shaft, and adapted to be engaged by the
105 yielding dog when projected, and a cam-guide for repressing the yielding dog at intervals, substantially as described.

14. A stocking-pressing machine comprising a press, means for opening and closing the
110 press at intervals, including a driving-shaft, a stocking-carrier passing through the press, a yielding dog mounted to rotate with the shaft, a carrier-driving wheel loosely mounted on the shaft, and provided with a projection
115 adapted to be engaged by the spring-dog, and a cam-guide for repressing the yielding dog at intervals, said guide being exterior to the path of the projection, and the yielding dog being deep enough to engage both the guide
120 and the projection, substantially as described.

15. A stocking-pressing machine comprising a press, a movable carrier, stocking-receiving forms mounted on the carrier in position to be carried through the press, and means for
125 opening and closing the press, including a rotating cam, a pair of levers projecting from opposite directions into the path of the cam, and adapted to be simultaneously oscillated thereby, and connections between the press
130

and outer ends of the levers, substantially as described.

16. A stocking-pressing machine comprising a press, a movable carrier, stocking-receiving forms mounted on the carrier in position to be carried through the press, and means for opening and closing the press, including a rotating cam, a pair of levers projecting from opposite directions into the path of the cam, and adapted to be simultaneously oscillated thereby, the inner end of one of said levers being located at one side of the cam and provided with a lug projecting beneath the cam in proximity to the cam-engaging end of the other lever, and connections between the press and outer ends of the levers, substantially as described.

17. A stocking-pressing machine comprising a press, a movable carrier, stocking-receiving forms mounted on the carrier in position to be carried through the press, and means for opening and closing the press at intervals comprising a rotating cam, a pair of levers projecting from opposite directions into the path of the cam and adapted to be simultaneously oscillated thereby, and connections between the press and outer ends of the levers, substantially as described.

18. A stocking-pressing machine comprising a press, a movable carrier, stocking-receiving forms mounted on the carrier in position to be carried through the press, and means for

opening and closing the press at intervals comprising a rotating cam, a pair of levers projecting from opposite directions into the path of the cam and adapted to be simultaneously oscillated thereby, the inner end of one of said levers being located at one side of the cam and provided with a lug projecting beneath the cam in proximity to the cam-engaging end of the other lever, substantially as described.

19. A stocking-pressing machine comprising a press, a movable carrier, stocking-receiving forms mounted on the carrier in position to be carried through the press, means for opening the press, and means for closing the press upon the stockings with a sudden blow, substantially as described.

20. A stocking-pressing machine comprising a press, consisting of a bed and superposed platen, means for lifting the platen at intervals, means for suddenly dropping the platen upon the bed, and a movable carrier, and stocking-receiving forms mounted on the carrier in position to be carried through the press, substantially as described.

In testimony that I claim the foregoing as my invention I affix my signature, in presence of two subscribing witnesses, this 22d day of April, A. D. 1903.

JOHN FRANKLIN NELSON.

Witnesses:

WM. J. SCOTT,

L. L. BEQUETTE.