No. 854,871. PATENTED MAY 28, 1907.

A. B. CALKINS.

MATCH MAKING MACHINERY.

APPLICATION FILED AUG. 10, 1906.

7 SHEETS—SHEET 1.

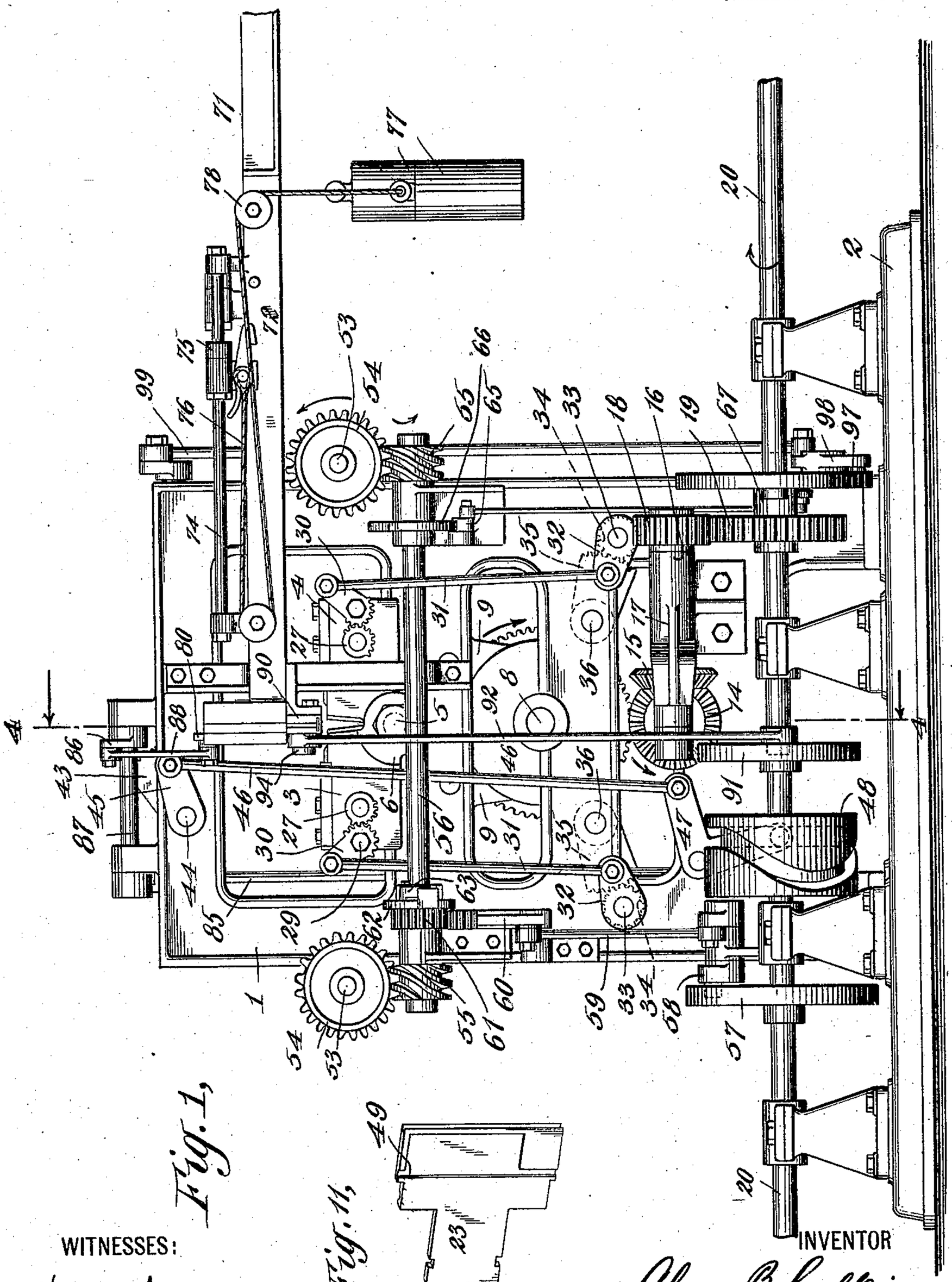

Fig. 1.

Fig. 11.

WITNESSES:

H. L. Crocheron

L. L. Andrews Jr.

INVENTOR

Alvan B. Calkins

BY

Chapin & Raymond

his ATTORNEYS

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7 SHEETS—SHEET 2.

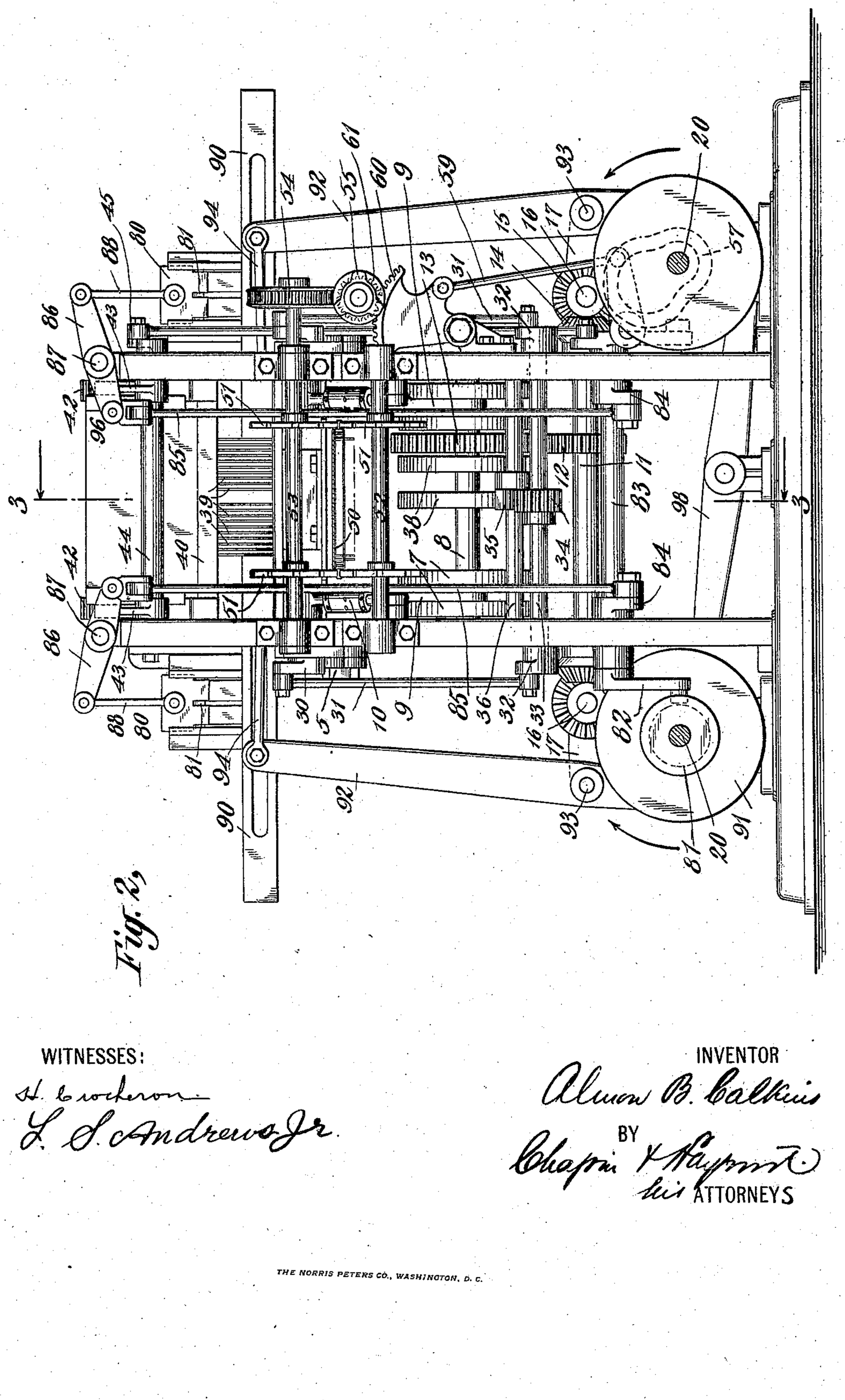

Fig. 2.

WITNESSES:

H. Brockerow

L. S. Andrews Jr.

INVENTOR

Alwon B. Calkins

BY

Chapin & Kaymond

HIS ATTORNEYS

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7 SHEETS—SHEET 3.

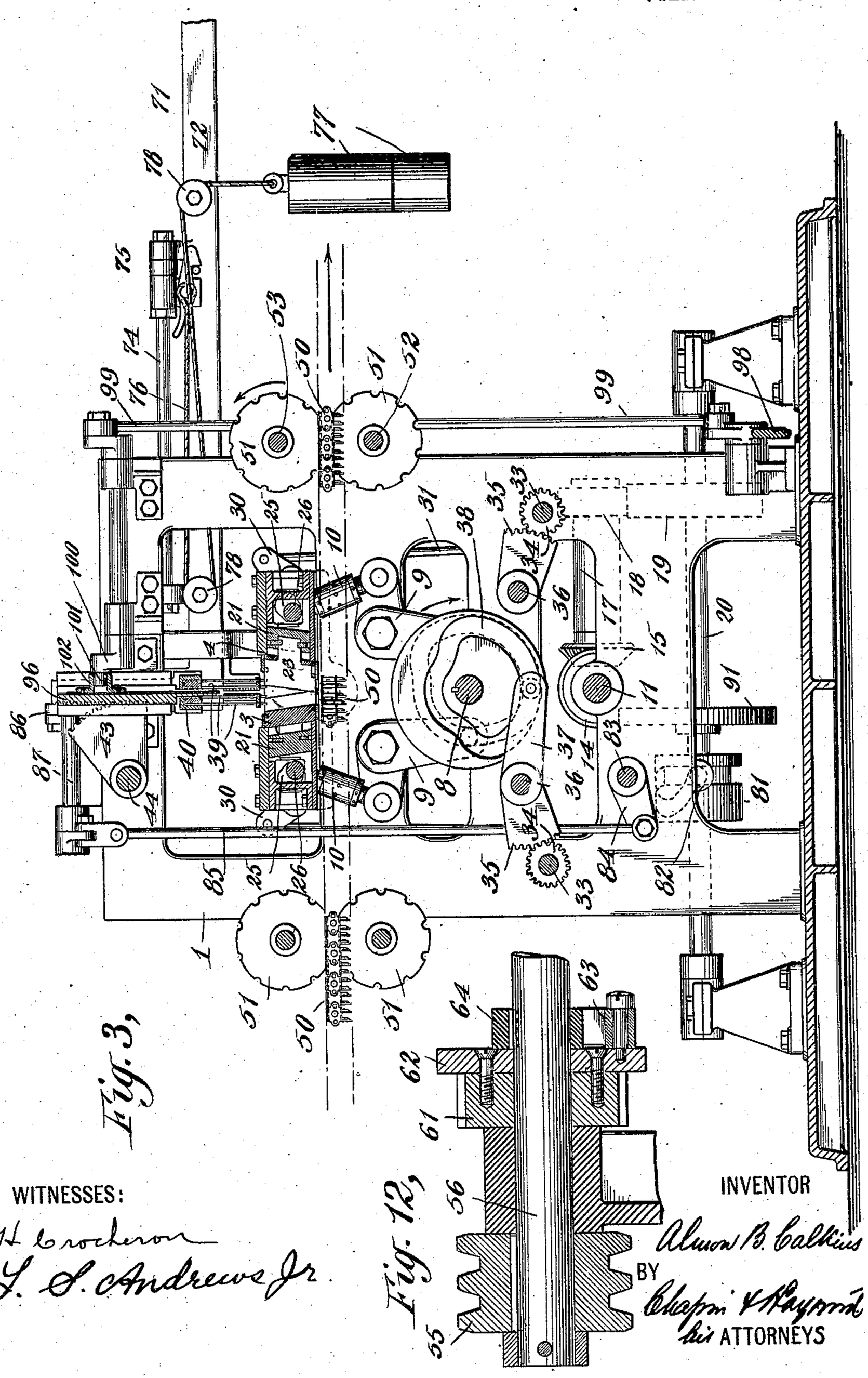

Fig. 3,

Fig. 12,

WITNESSES:

H. Crocheron

L. S. Andrews Jr.

INVENTOR

Alvan B. Calkins

BY

Chapin & Raymond

his ATTORNEYS

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7 SHEETS—SHEET 4.

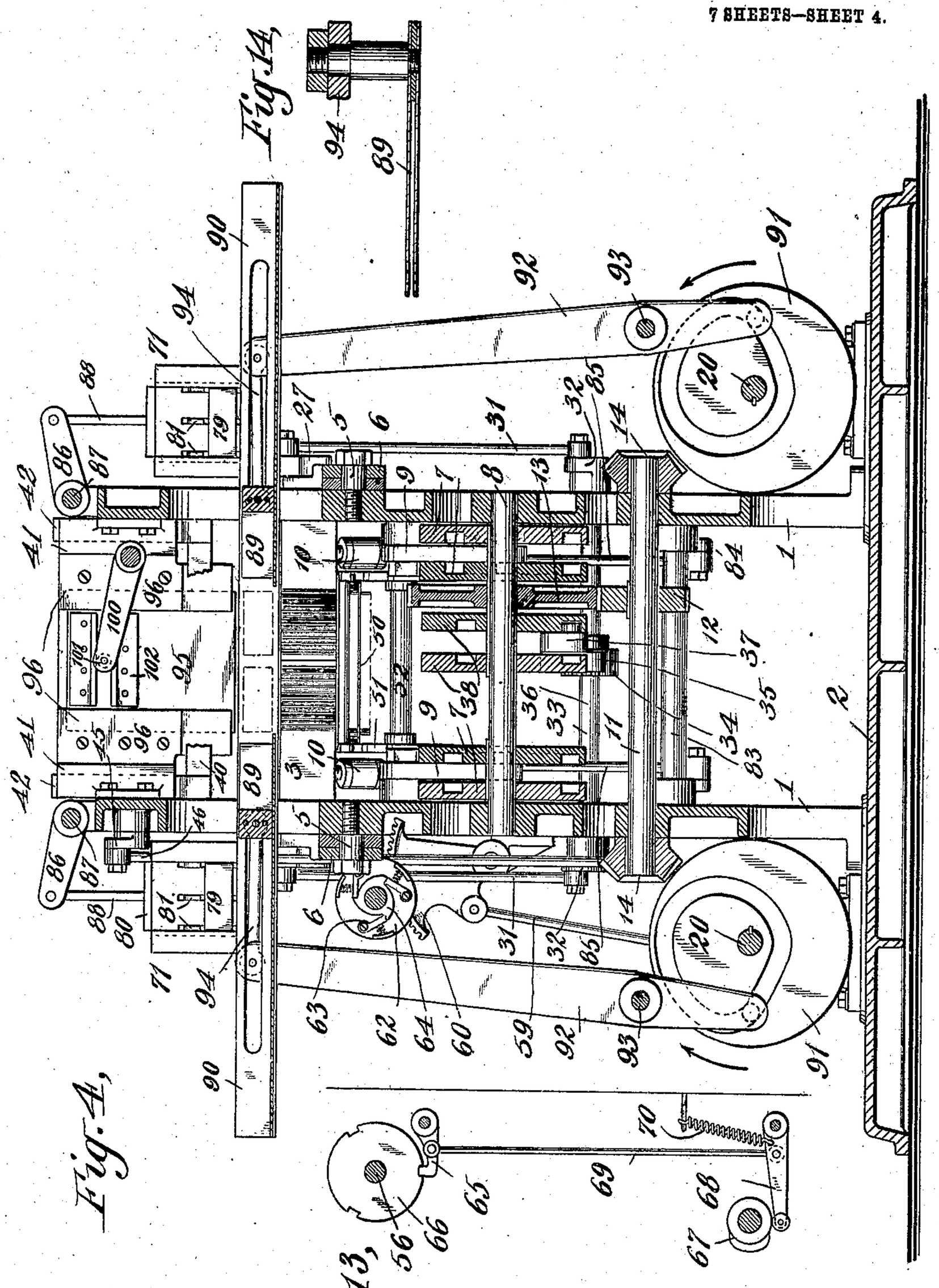

Fig. 4,

Fig. 13,

WITNESSES:

H. L. Crockeron

L. S. Andrews Jr

INVENTOR

Alonzo B. Calkins

BY

Chapin & Raymond

ATTORNEYS

No. 854,871. PATENTED MAY 28, 1907.

A. B. CALKINS.

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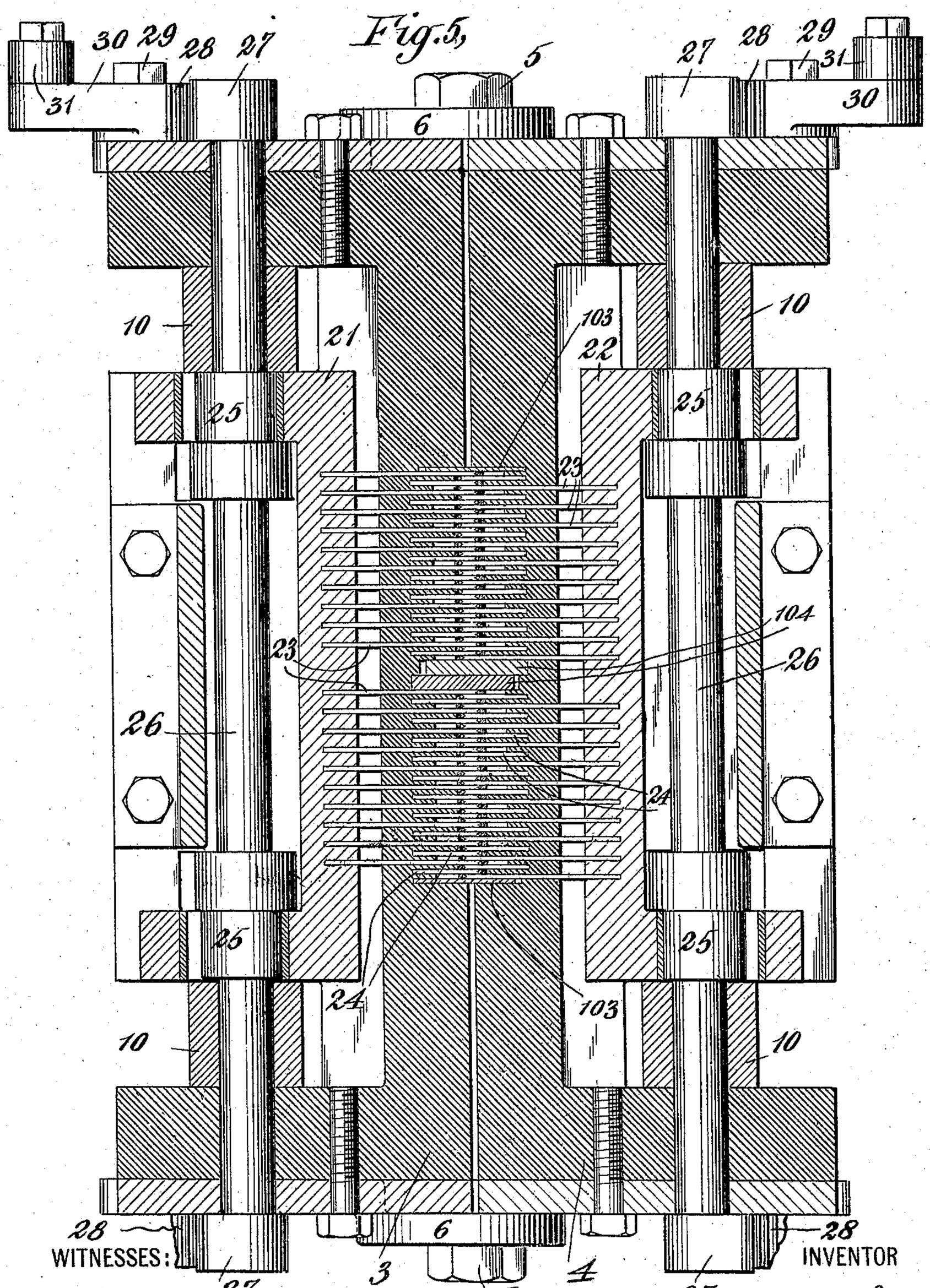
7 SHEETS—SHEET 5.

Fig. 5.



WITNESSES:

H. L. Crocheron

L. L. Andrews, Jr.

INVENTOR

Alvum B. Calkins

BY

Chapin & Hayward

his ATTORNEYS

No. 854,871. PATENTED MAY 28, 1907.

A. B. CALKINS.

MATCH MAKING MACHINERY.

APPLICATION FILED AUG. 10, 1906.

7 SHEETS—SHEET 6.

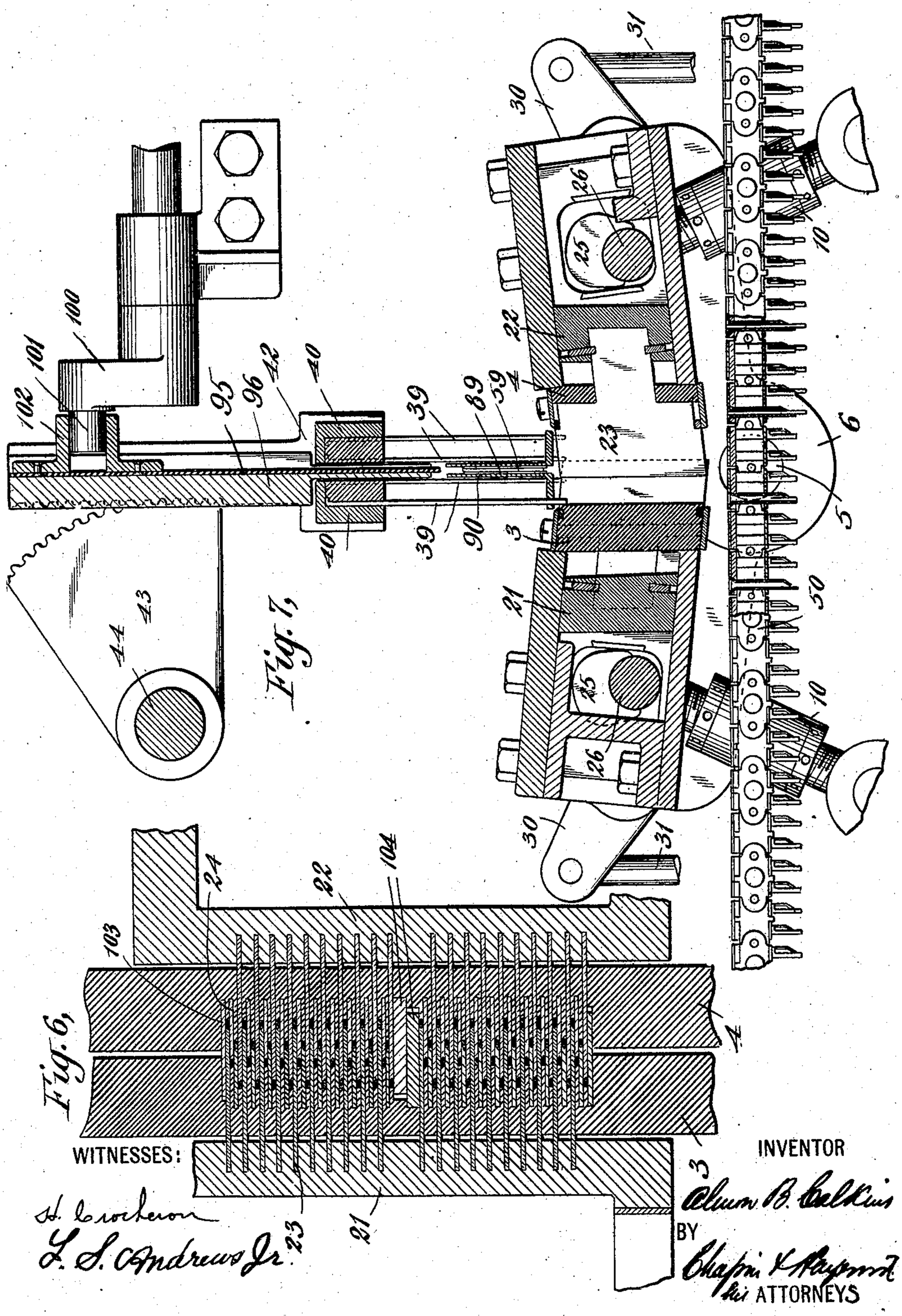


Fig. 7.

Fig. 6.

WITNESSES:

H. Le rocheron

L. S. Andrews Jr.

INVENTOR

Alvin B. Calkins

BY

Chapin & Hayward

his ATTORNEYS

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A. B. CALKINS.

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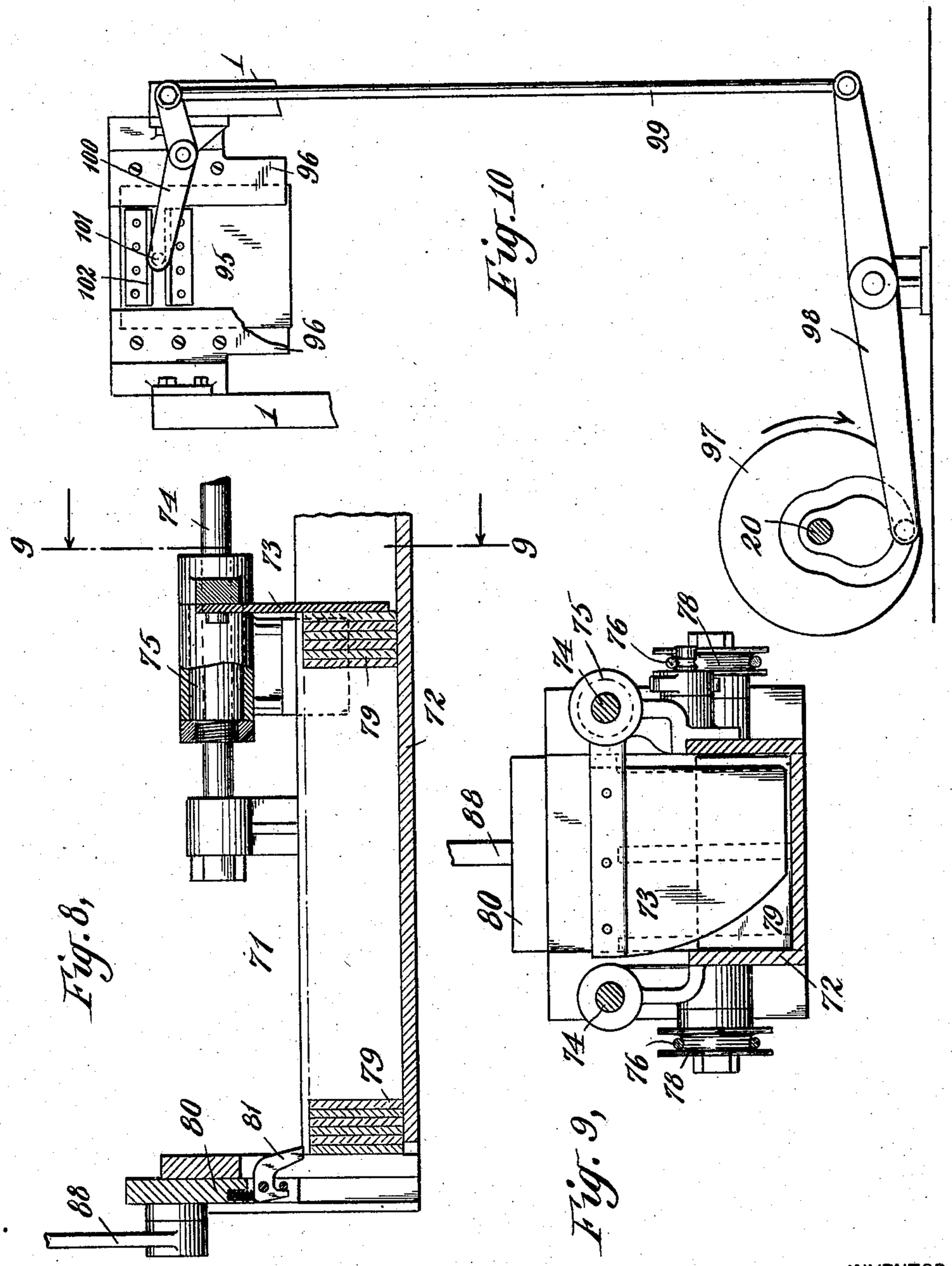
APPLICATION FILED AUG. 10, 1906.

7 SHEETS—SHEET 7.



WITNESSES:

H. Corcoran

L. S. Andrews Jr.

INVENTOR

Alvan B. Calkins

BY

Chapin & Hayward

ATTORNEYS

UNITED STATES PATENT OFFICE.

ALMON B. CALKINS, OF BELLEVILLE, NEW JERSEY.

MATCH-MAKING MACHINERY.

No. 854,871. Specification of Letters Patent. Patented May 28, 1907.

Application filed August 10, 1906. Serial No. 330,027.

To all whom it may concern:

Be it known that I, ALMON B. CALKINS, a citizen of the United States of America, and a resident of Belleville, county of Essex, State of New Jersey, have invented certain new and useful Improvements in Match-Making Machinery, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof:

My invention relates to improvements in match making machinery, and particularly to means for severing veneer into splints, separating the splints so formed, and sticking them into carriers by which they may be supported for dipping and like purposes.

My invention consists, first, in the novel form and construction of the cutting means comprising permanently interlocked oscillating shearing cutters. These cutters are arranged in two sets, the cutters of each set alternating with the cutters of the opposite set, and both sets oscillating in the manner of shears so as to impart shearing cuts to the material introduced between them. In this form of splint cutting means the splints produced are separated in the act of cutting into two rows, the splints being arranged alternately in each row. It follows from this that the individual splints in each row will be spaced apart from adjacent splints just the width of a splint, *i. e.* the space occupied by the alternate splints which have been moved away. For practical purposes, however, the splints, when in this condition, are not sufficiently separated for the further treatment which they are to receive, such as the dipping, etc. The second part of my invention relates to the method of further separating the splints, which consists in moving certain of the cutters of each set forward a distance greater than the other cutters. By this means I separate the splints, initially separated into two rows, into two more rows, so that there are in all four rows of splints, the splints of each row separated from the adjacent splints in the same row a distance equal to the width of three splints. I then provide means to force the splints thus separated into carriers by which they may be held separated and conveyed away for the purpose of further treatment; and the third feature of my invention consists in the improved means whereby the splints may be removed from the cutting mechanism and introduced into the carrying means, such means comprising a peculiar formation of the cutter, giving clearance to the splints beyond a certain point, and plunger means for forcing the splints out of such clearance space into the carriage.

My invention also consists in many novel details of construction and combinations of parts in an organized machine for feeding veneer blanks to cutting means, cutting means for severing the blanks into splints and for separating the splints into a plurality of rows, means for sticking separated splints into carriers, and feeding means for the carriers.

In order that my invention may be fully understood, I will now proceed to describe an embodiment thereof contained in such an organized machine, and will then point out the novel features in claims.

In the drawings illustrating such embodiment Figure 1 is a view in end elevation of the machine. Fig. 2 is a view in side elevation thereof with the drive shafts shown in section. Fig. 3 is a view in transverse section therethrough, the plane of section being taken substantially upon the line 3—3 of Fig. 2. Fig. 4 is a view in transverse section therethrough, the plane of section being taken upon the line 4—4 of Fig. 1. Fig. 5 is a view in horizontal section on an enlarged scale, showing the cutting mechanism with the parts in the positions in which they will be after the splints have been formed and separated into two rows, but before they have been separated into four rows. Fig. 6 is a similar view of certain parts thereof, showing the same moved forward to a position to separate the splints into four rows. Fig. 7 is a transverse sectional view on an enlarged scale of the cutters and certain co-related parts, the said cutters having been moved to substantially the same position as shown in Fig. 5. Fig. 8 is a detail view in partial longitudinal section through one of the feed troughs and certain co-related parts. Fig. 9 is a transverse sectional view therethrough substantially upon the line 9—9 of Fig. 8. Fig. 10 is a detail view showing the feed plunger and the operating means therefor. Fig. 11 is a detail view in perspective of one of the cutter blades removed. Fig. 12 is a detail sectional view of the gearing through which intermittent step by step movement is imparted to the splint carrier. Fig. 13 is a detail view of the mechanism for locking the carrier chain against movement while splints

are being inserted therein. Fig. 14 is a detail top view of a veneer carrier employed.

Referring to the machine shown in the drawings by reference characters, 1, 1 designate side frames, and 2 a bed plate, which together form the main supporting frame of the entire machine. Main cutter heads 3 and 4 are mounted to oscillate upon studs 5, forming fixed trunnions fast to the frame of the machine, the said heads being provided with downwardly extending overlapping lugs fitted to the said studs for this purpose. Movements of oscillation are imparted to the said cutter heads by means of cams 7, said cams rigidly mounted upon a cam shaft 8. These cams engage bell crank levers 9, which are, in turn, connected by means of connecting members 10 with the cutter heads, the said connecting members 10 preferably comprising turn-buckles, whereby they may be accurately adjusted as to length. The cam shaft 8 is driven from an intermediate shaft 11 by means of a pinion 12 mounted upon said intermediate shaft, and a spur gear 13 upon said cam shaft 8. The intermediate shaft 11 is also provided at its opposite ends with bevel gears 14, which intermesh with similar bevel gears 15 upon short horizontal shafts 16 mounted in bearings 17 secured to the side frames 1, said short horizontal shafts also carrying pinions 18, which mesh with drive gears 19 fast upon main shafts 20, one of which constitutes the drive shaft of the machine. Each of the heads 3 and 4 carry a plurality of cutter blades, said blades of either head being alternately arranged and permanently interlocked. When the heads have been moved to one position, such for instance as is shown in Fig. 3, the lower edges only of the said cutter blades overlap, somewhat in the nature of a pair of shears when open, while, when the heads have been oscillated to a position such for instance as is shown in Fig. 7, the said blades interlock all along their cutting edges, after the manner of shears when closed, the said cutting edges of opposite sets of cutters being substantially parallel. It will follow, then, that, if a section of veneer be fed between the cutter blades when they are in such a position as is shown in Fig. 3, an exceedingly powerful shearing action will be exerted thereon when the heads are moved from such a position to a position such as is shown in Fig. 7, to sever the veneer into splints, said splints being not only severed, but at the same time separated into two rows, as will be readily understood by reference to Fig. 5 of the drawings.

In order to further separate the splints, that is, to separate each row of splints thus formed, into two rows so that there will be four rows in all, I have provided the main cutter heads with supplemental cutter heads 21, 22, the main head 3 carrying the supplemental head 21, and the main head 4 carrying the supplemental head 22. I have, then, secured the alternate cutter blades of each head alternately with the main cutter head and the supplemental cutter head thereof. To distinguish in the drawings, I have designated the cutter blades of each set which are secured to the supplemental heads by the reference character 23, while the cutter blades which are secured fast to the main heads are designated by the reference character 24. During the movement of the main heads so far described, the supplemental heads will move substantially synchronously therewith, and the main and supplemental cutter blades will hence also move together. I have provided, however, for another movement of the supplemental heads, that is, a forward and rearward movement thereof in and with respect to the main cutter heads, so that the supplemental cutter blades may be moved forward a farther distance after the movement of the main cutter blades has been completed. To this end I arrange the supplemental cutter heads 21 and 22 so that they will be free to move for a limited distance in slideways in the said main cutter-heads, and I provide cams 25 upon shafts 26 journaled in the main cutter heads, which cams engage portions of the supplemental cutter heads, to impart the required movement thereto. The shafts 26 are provided with gear sectors 27 at their outer ends, said gear sectors intermeshing with corresponding gear sectors 28 mounted upon studs 29 projecting from the ends of the main heads. The gear sectors 28 are provided with arms 30 connected by links 31 with arms 32 mounted upon transverse shafts 33. Said transverse shafts 33 are provided with pinions 34 which are engaged by gear sectors 35 mounted to rock upon shafts 36, said shafts also carrying operating arms 37 which are engaged by cams 38 upon the cam shaft 8. The cams 38 are so constructed and timed with respect to the cams 7 that, after the main and supplemental heads have been together moved to effect the shearing operation, a continued movement will be imparted to the supplemental heads 21 and 22 by the mechanism just described to advance the cutting faces of the supplemental cutter blades 25 beyond the cutting faces of the main cutter blades 24, whereby alternate splints in each of the two rows in which they are shown in Fig. 5 will be advanced to form two more rows, substantially as is shown in Fig. 6 of the drawings. With the parts in this position, it will be seen that the veneer has been severed into splints, and the splints themselves separated into four rows, the splints of each row being four times the width of a splint apart. In this position the splints are ready to be received in carriers, by which they may be conveyed away for dipping and other purposes. For the purpose of ejecting

them from their position between the cutters into such carriers, I have provided a plurality of plunger pins 39 carried by a head 40. The pins are arranged in four rows immediately above the positions which the splints occupy when the parts are arranged as shown in Fig. 6. The head 40 is arranged to reciprocate vertically in slides 41 secured to the frame of the machine, the said heads being provided with toothed racks 42 engaged by gear sectors 43 mounted upon a shaft 44. Fast to the shaft 44 (see particularly Fig. 1) is an operating arm 45, which is connected by means of a link 46 with one arm of a bell crank lever 47. The other arm of the bell crank lever engages a cam 48 upon one of the shafts 20. The cam 48 is so proportioned and timed with respect to the cams upon the shaft 8 as to cause the plunger head 40 and pins 39 to move downward and back again after the shearing operation has been completed and the supplemental cutters have been moved the limit of their forward movement. In other words, the plungers 40 move downward and back again while the cutter blades are in the position in which they are shown in Fig. 6. The cutter blades (one of which is shown in detail in Fig. 11) are preferably slightly recessed at the part engaging the splints, when in a position to be ejected. This relieves the side pressure upon the splints at such time, leaving them free to be ejected lengthwise by the plungers. The depth of this recess is very slight, in practice about two one-thousandths of an inch, and it does not appear in most of the figures of the drawings because the scale is not such as to permit it, but the said recessed portion is shown in exaggerated form at 49 in the detail view Fig. 11. This recess though slight is quite important, because I have found in practice that extreme difficulty is experienced in ejecting the splints longitudinally from between the cutters unless the side pressure is relieved. The splints, when thus ejected, are received in carriers 50 arranged to travel beneath the cutter blades. These carriers are in the form of a chain of any suitable length, said chain being supported and driven by means of sprocket wheels 51. The sprocket wheels are mounted upon shafts 52, 53, the upper set 53 being provided with worm wheels 54, which intermesh with worms 55 upon a shaft 56. Intermittent step by step movements are imparted to this shaft 56 from a cam 57, through intermediate mechanism comprising a bell crank lever 58 engaged by said cam 57, the other arm of said bell crank lever connected by means of a link 59 with a gear sector 60, a pinion 61 loose upon the shaft 56, a disk 62 fast to the said pinion, pawls 63 carried by the said disk, and a ratchet wheel 64 fast upon the shaft 56. The worm wheel shaft 56, and hence the carrier chain actuated thereby, is held stationary intermediate the step by step driving movements, by means of a pivoted dog 65, which engages notches in the periphery of a disk 66 upon the said shaft 56, the dog 65 being withdrawn from the notches by means of a cam 67 upon the shaft 20, which carries the cam 57. The cam 67 operates to withdraw the dog 65 through a pivoted lever 68 and link 69 against the tension of a spring 70 just prior to the commencement of the active operation of the said cam 57. After the cam 57 has completed its active movement, the dog 65 will again enter a notch in the disk 66, and will hold the carrier chain absolutely locked against movement while it is receiving splints from the cutting mechanism.

In the present machine I have arranged to feed in two veneer cards at a time from a pair of magazines 71 arranged upon either side of the machine. These two magazines are quite similar, and each comprises an open topped feed trough 72, one or more followers 73 and feeding mechanism. The feed troughs are provided longitudinally upon either side with guide rods or bars 74, upon which are mounted sleeves 75. The sleeves carry the follower blades 73, which are pivoted thereto so that they may be swung down into the trough, or swung up clear of same, as may be desired. Flexible connections 76 are secured to the sleeves at one end, and at the other end are attached to weights 77. Direction pulleys 78 are provided for the cord 76 intermediate their ends, whereby the weights 77 tend to push the followers forward to feed the veneer cards 79 contained in the troughs 72 toward the feeding mechanism. The feeding mechanism consists of a sliding plate 80 for each trough, said sliding plate provided with one or more teeth 81 spring-pressed as in the nature of a pawl, whereby they will engage a single veneer card when moving in one direction, as is shown in Fig. 8, but will yield when moving in the other direction so as to clear the veneer cards, which will have been forced forward by the action of the follower mechanism. The plates 80 are operated from a cam 81 upon one of the shafts 20, the said cam engaging an arm 82 secured upon a rock shaft 83, said rock shaft also provided with arms 84, 84, which are connected by means of links 85 with levers 86. Said levers 86 are pivoted upon studs 87, and upon opposite ends are connected by links 88 with the sliding plates 80.

The veneer cards, which are actuated by the aforesaid feeding means, are forced downward into horizontal reciprocating carriers 89, which, at this time, are held in position beneath the end of the feed troughs 72. These carriers are arranged to slide horizontally in ways 90 by means of cams 91 upon the shafts 20. Levers 92, pivoted at 93, engage the cams 91 at one end thereof, and are

connected by links 94 with the carriers at the other end. The cams 91 are so proportioned and timed as to cause the carriers 89 to receive the veneer cards at the moment the feeding plates move downward to present them thereto, and, after they have received said veneer cards, the carriers will be moved forward toward the center of the machine.

The carriers, which, it will be understood, are of a size sufficient to receive but one veneer card at a time, are open at the top, the bottom and the front end. The bottom of the ways 90 is cut away at the middle so that, when the carriers reach a point above the cutter blades, the veneer cards held thereby will be free to move downward to a point between the working faces of said cutter blades. In order to insure their downward movement, I provide a reciprocating plate 95 arranged to move downward when the veneer cards are beneath it, said reciprocating blade sliding in ways 96 and arranged to be operated by a cam 97 upon one of the shafts 20, said cam engaging a lever 98, which is, in turn, connected by means of a link 99 with a bell crank lever 100, whose other arm is provided with a stud 101, which engages transverse ways 102 upon the said blade 95. The blade 95 passes freely through both said carriers 89, and forces the veneer cards, which have been brought thereby to a position beneath the said blade, downward to a point between the operating faces of the cutter blades 23, 24. A complete feeding operation of the machine, then, includes the forcing of a veneer card from each of the feed troughs 72 by the downward movement of the plates 80 carrying the feed dogs 81, into the veneer carriers 89, the moving of the veneer carriers 89 toward the center of the machine, and then the downward feeding movement of the blade 95.

It will be noted that the carrier heads 3 and 4 are provided with spacing strips 103 and 104, which will properly confine the veneer cards laterally in position between the cutter blades, so that the said veneer cards will be in proper register when the blades are moved forward to sever the cards into splints. The cutter actuating cams are, of course, timed to operate the cutters immediately after the veneer cards have been received thereby, and, as above set forth, the plungers will be operated immediately after the splints have been severed and separated, to discharge the said splints into the carriers beneath the cutters.

What I claim is:

1. Splint cutting mechanism including a plurality of cutter blades arranged to be moved together in a cutting operation, and means for moving certain of the cutter blades in advance of others to effect separation of the cut splints.

2. Splint cutting mechanism comprising two opposed sets of alternately arranged cutter blades arranged to be moved relatively backward and forward to effect a cutting operation, certain of the cutter blades of one set being movable to positions beyond the positions of the other blades in that set.

3. Splint cutting mechanism comprising two opposed sets of alternately arranged cutter blades arranged to be moved backward and forward to effect a cutting operation, certain of the cutter blades of each set being movable to positions beyond the positions of the other blades in each said set.

4. Splint cutting mechanism comprising two heads provided with interlocking cutter blades, each head having certain of its cutter blades stationary therewith and others of its cutter blades movable with respect thereto.

5. Splint cutting mechanism comprising two heads provided with interlocking cutter blades, each head having alternate stationary and movable blades therein.

6. Splint cutting mechanism comprising two opposed sets of alternately arranged permanently interlocked cutter blades arranged to be moved backward and forward to effect a cutting operation, certain of the cutter blades of each set being movable to positions beyond the positions of the other blades in each said set.

7. Splint cutting mechanism comprising two heads provided with interlocking cutter blades, portions thereof being permanently interlocked, each head having certain of its cutter blades stationary therewith and others of its cutter blades movable with respect thereto.

8. Splint cutting mechanism comprising two heads provided with interlocking cutter blades, portions thereof being permanently interlocked, each head having its blades alternately stationary and movable.

9. Splint cutting mechanism comprising two sets of alternately arranged oscillating shearing cutters, each set composed of stationary and movable blades.

10. Splint cutting mechanism comprising two opposed oscillating cutter heads, said heads provided with alternately arranged interlocking shearing cutter blades, certain of the cutter blades carried by each head being stationary therein and others being movable therein, substantially as set forth.

11. Splint cutting mechanism including main and supplemental cutter heads mounted one within the other and adapted to be moved together, a plurality of cutter blades carried alternately by said main and supplemental heads, means co-operating with said cutter blades in a cutting operation, and means for imparting supplemental movements to said supplemental head in addition to the movements imparted to said main and supplemental heads together.

12. Splint cutting mechanism comprising two main cutter heads and two supplemental

cutter heads mounted in the main cutter heads and movable therewith, but capable of movements in said main cutter heads with respect thereto, cutter blades carried by said main and supplemental heads, means for moving said main and supplemental heads together to effect a splint cutting operation, and means for imparting further movements to said supplemental heads to separate certain of the splints after they have been cut from others of the splints.

13. Splint cutting means comprising two sets of alternately arranged opposed cutters for severing veneer into splints and at the same time separating the splints into two rows, of means for imparting additional movements to certain of the cutters of each set to separate the two rows of splints into four rows.

14. Splint cutting mechanism comprising main cutter heads, and means for moving said cutter heads toward and away from each other, supplemental cutter heads mounted in said main cutter heads and carried thereby, means for moving said supplemental cutter heads backward and forward in said main cutter heads, and alternately arranged opposed cutting blades carried by said main and supplemental cutter heads.

15. Splint cutting mechanism comprising pivoted main cutter heads, means for oscillating said heads about said pivots, supplemental cutter heads mounted in said main cutter heads and carried thereby, means for moving said supplemental cutter heads backward and forward in said main cutter heads, and alternately arranged opposed cutting blades carried by said main and supplemental cutter heads.

16. Splint cutting mechanism comprising main cutter heads pivoted to oscillate about a common axis, and means for so oscillating said cutter heads, supplemental cutter heads mounted in said main cutter heads and carried thereby, means for moving said supplemental cutter heads backward and forward in said main cutter heads, and alternately arranged opposed cutting blades carried by said main and supplemental cutter heads.

17. The combination with relatively movable cutter heads, of two veneer card magazines, two individual veneer card carriers, means for feeding individual veneer cards from the magazines to the veneer card carriers, and means for moving the veneer card carriers to a position to present the veneer cards carried thereby to the cutter heads.

18. The combination with relatively movable cutter heads, of a veneer card magazine, an individual veneer card carrier, means for feeding individual veneer cards from the magazine to the veneer card carrier, and means for moving the veneer card carrier from a position adjacent the veneer card magazine to a position adjacent the cutter heads.

19. The combination with relatively movable cutter heads, of a veneer card magazine, an individual veneer card carrier, means for feeding individual veneer cards from the magazine to the carrier, means for moving the veneer card carrier from a position adjacent the magazine to a position adjacent the cutter heads, and feeding means for forcing the veneer card from the carrier to the cutter heads.

20. The combination with relatively movable cutter heads, of two veneer card magazines, two individual veneer card carriers, means for feeding individual veneer cards from the magazines to the veneer card carriers, means for moving the veneer card carriers from positions adjacent the magazines to positions adjacent the cutter heads, and a common means for forcing the veneer cards from the carriers to the cutter heads.

21. The combination with two sets of alternately arranged opposed cutter blades, of two veneer card magazines, two individual veneer card carriers, one for each magazine, means for feeding individual veneer cards from the magazines to the carriers, means for reciprocating the carriers toward and away from the cutters, and a common means for simultaneously feeding veneer cards from both said carriers to the cutter blades.

22. Splint cutting mechanism comprising two opposed sets of alternately arranged cutter blades arranged to be moved backward and forward to effect a cutting operation, certain of the cutter blades of each set being movable to positions beyond the positions of the other blades in each set, and means for feeding veneer cards to positions between the said cutter blades when they are in their backward positions.

23. Splint cutting mechanism comprising two opposed sets of alternately arranged cutter blades arranged to be oscillated to effect a cutting operation, certain of the cutter blades of each set being movable to positions beyond the positions of the other blades in each set.

24. Splint cutting mechanism comprising two sets of alternately arranged permanently interlocked cutter blades arranged to be oscillated to effect a cutting operation, certain of the cutter blades of each set being movable to positions beyond the positions of the other blades in each set to effect separating movements of the splints after they have been cut.

25. Splint cutting mechanism comprising two sets of alternately arranged opposed cutting blades, said cutting blades having recessed portions in their side walls to the rear of the cutting edges thereof, substantially as specified.

26. The combination with two sets of al-

ternately arranged interlocking cutter blades, of two rows of plungers arranged in staggered relation in line therewith to discharge splints longitudinally from between the cutters, the walls of the said cutters being slightly recessed at the discharge points, substantially as specified.

27. The combination with two sets of alternately arranged opposed cutters, means for moving the two sets of cutters backward and forward with relation to each other to effect a splint cutting operation, and to initially divide the splints into two rows, means for advancing certain of each set of cutters with respect to others to sub-divide the two rows of splints into four rows, splint carrying means arranged to travel beneath the cutters, and four rows of plungers, the individual plungers of each row being arranged in staggered relation with the plungers of the other rows, arranged above the cutters, and means for reciprocating the plungers to force the splints longitudinally from between the cutter blades into carriers.

28. The combination with alternately arranged opposed cutter blades arranged to cut veneer into splints and separate the splints into four rows, of four rows of plungers arranged in line with the splints when so cut and separated, and means for operating the said plungers to simultaneously discharge the four rows of splints lengthwise from between the cutter blades.

29. Splint cutting mechanism comprising four sets of cutter blades, each set being movable with respect to all the other sets heads in which said blades are mounted, said heads mounted to oscillate on pivots located beneath the cutting faces of the blades, and means for oscillating the said heads.

30. Splint cutting mechanism comprising two oppositely arranged pivoted heads, two sets of cutter blades for each head, means for moving the sets of each head relatively to each other the blades of opposite heads being permanently interlocked at their lower ends, the cutting faces arranged at an angle to each other in the limit of their movement in one direction, and substantially parallel when in the limit of their movement in the other direction, and means for oscillating the heads upon their pivotal supports to so move the said blades.

31. Splint cutting mechanism comprising two oppositely arranged pivoted heads, two sets of cutter blades carried thereby, supplemental heads arranged to slide in said first named heads, two sets of cutter blades carried by said supplemental heads, means for oscillating said main heads to produce splints and separate them into two rows, and means for moving said supplemental heads to separate each said row of splints into two rows.

In witness whereof, I have hereunto set my hand in the presence of two witnesses.

ALMON B. CALKINS.

Witnesses:
F. M. SEYMOUR,
C. A. DOUGHERTY.