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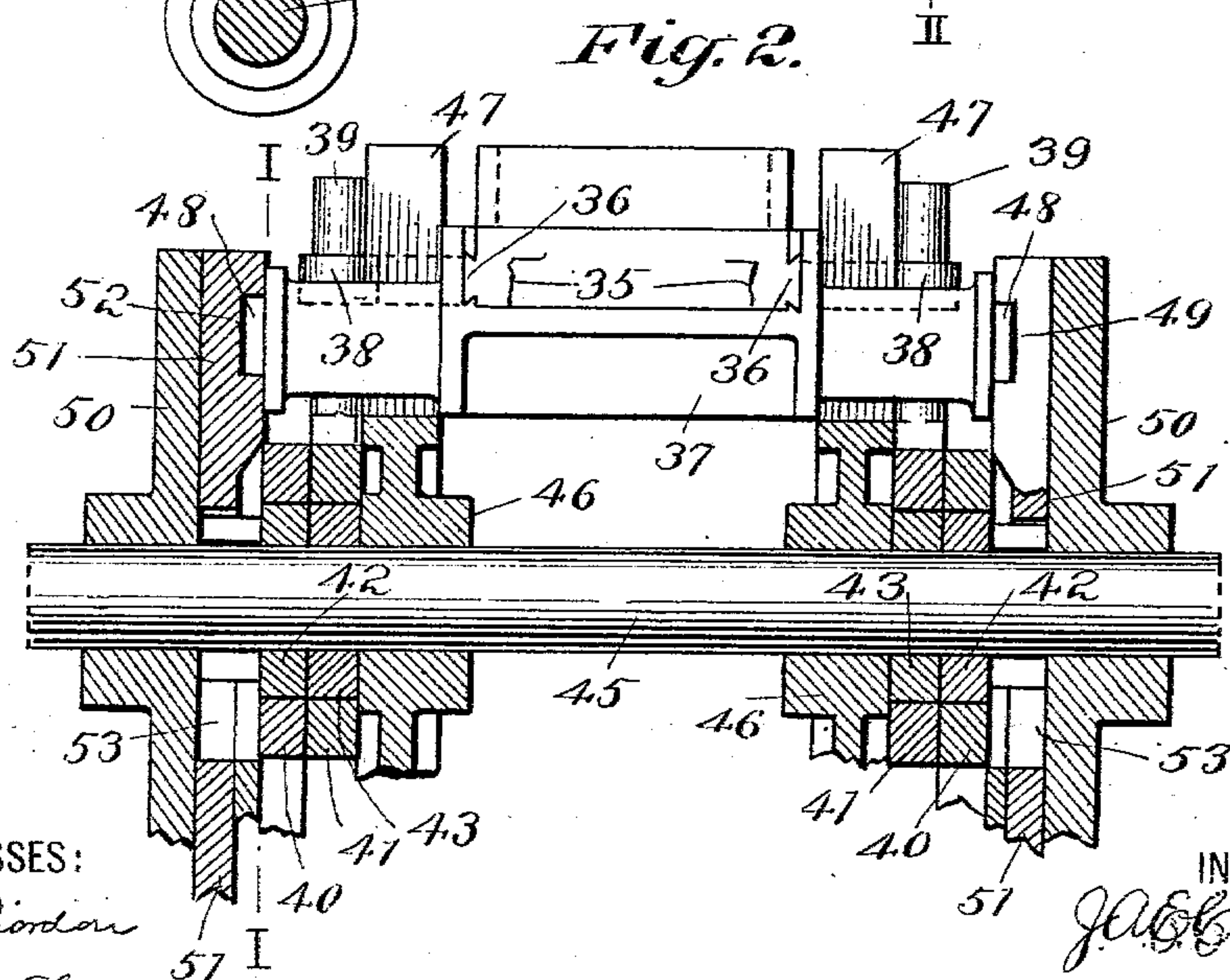
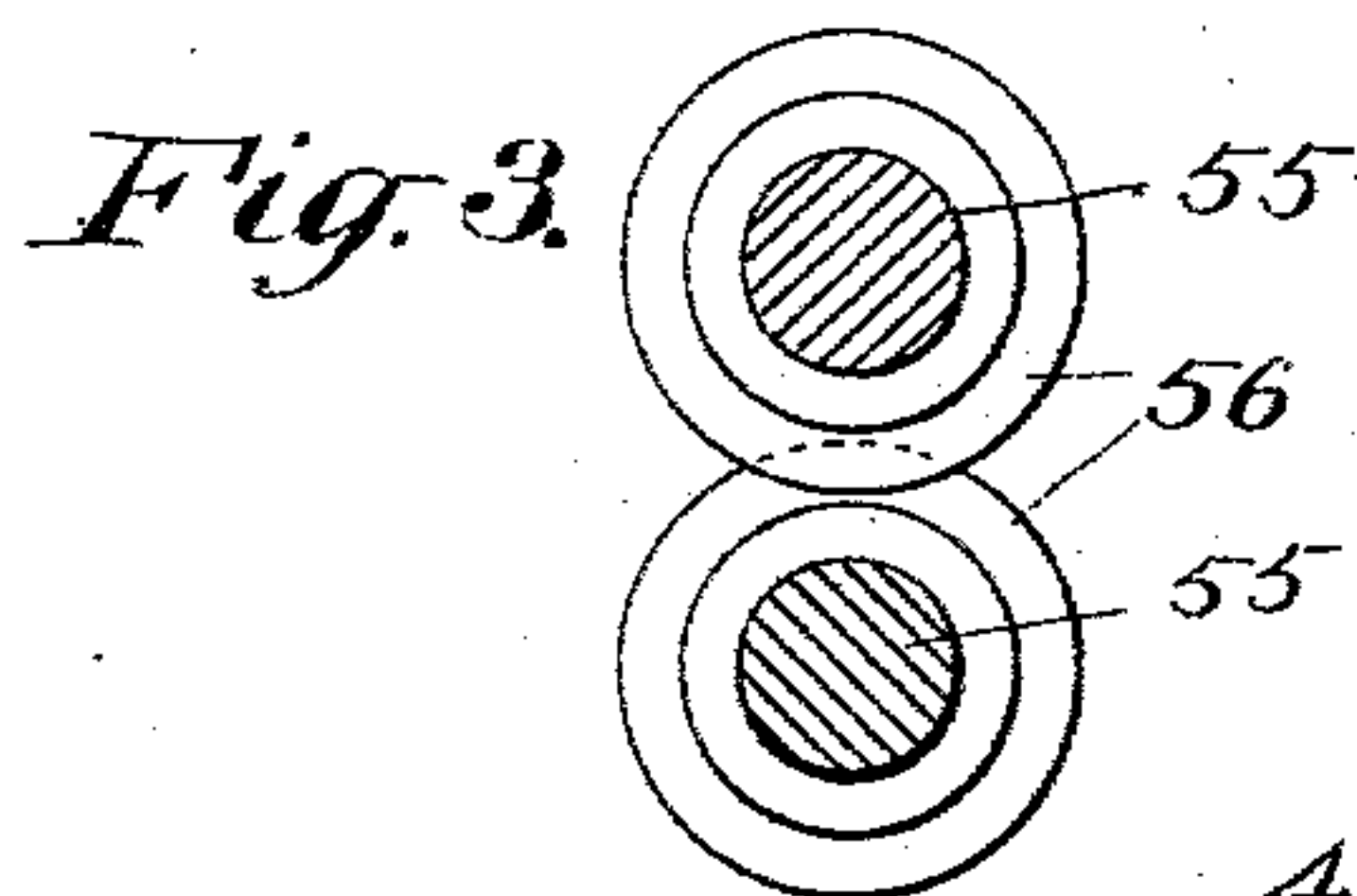
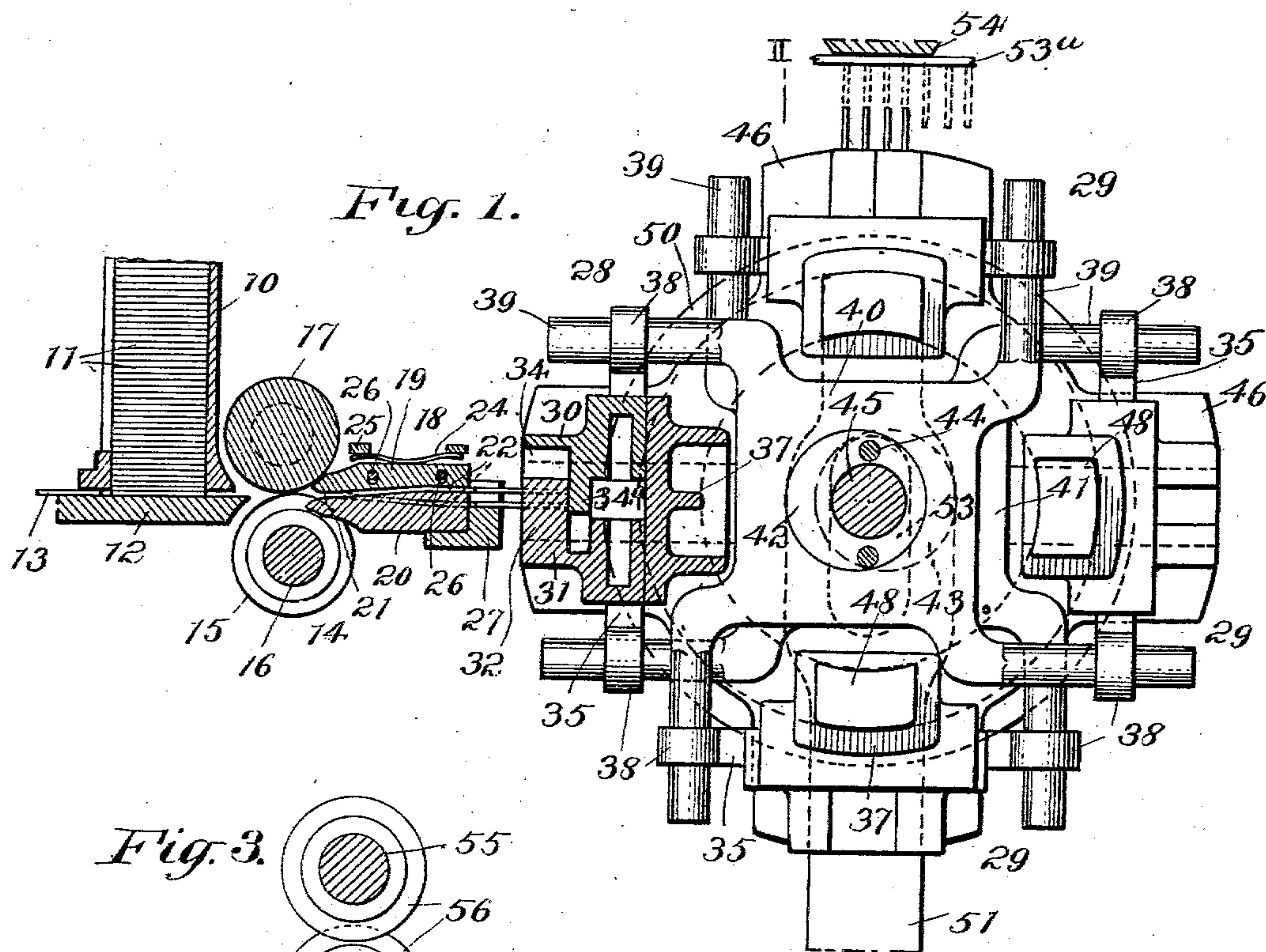
Patented Dec. 23, 1902.

J. A. E. CRISWELL.
MACHINE FOR MAKING MATCHES.

(Application filed Sept. 5, 1901.)

(No Model.)

2 Sheets—Sheet I.



WITNESSES:
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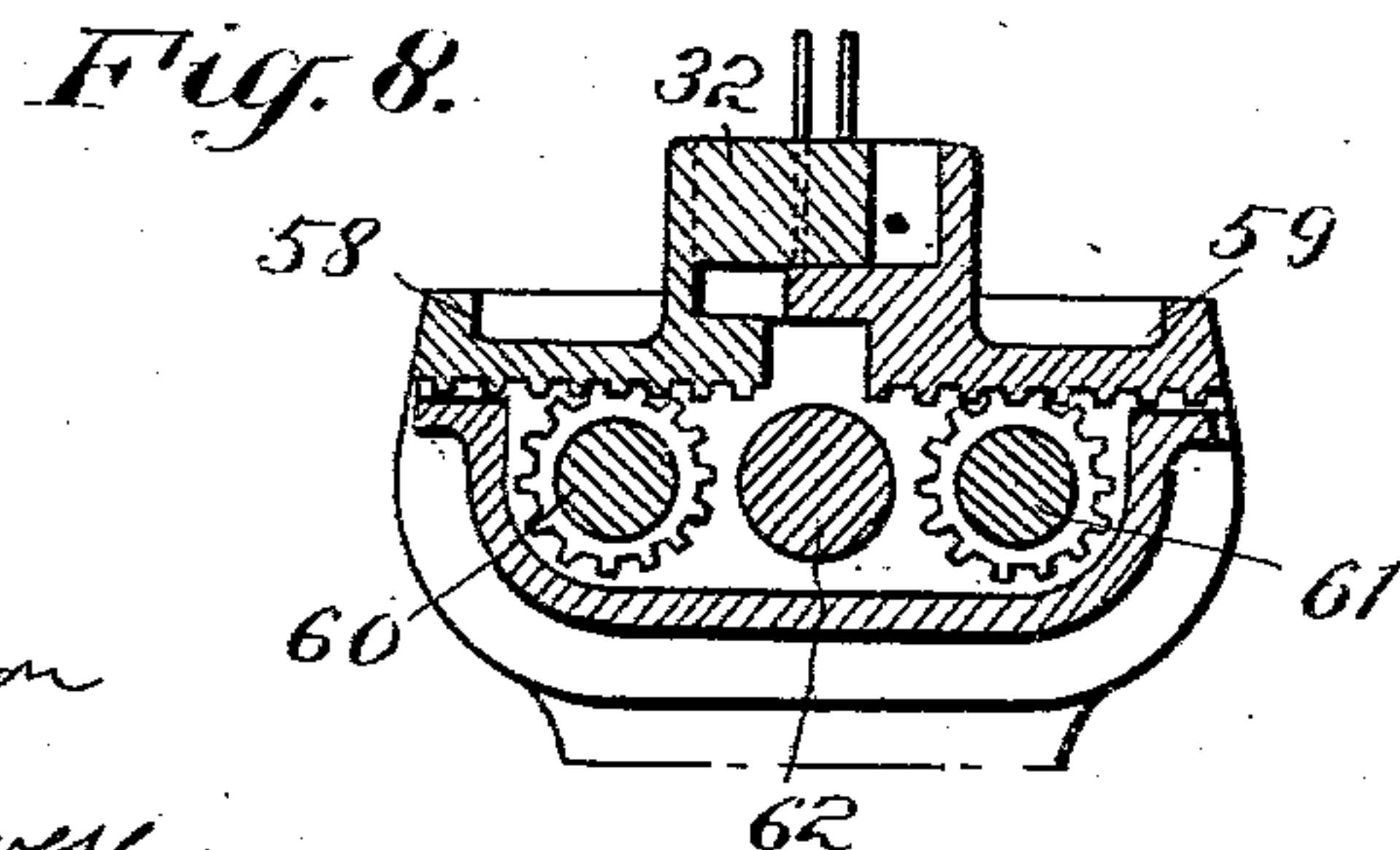
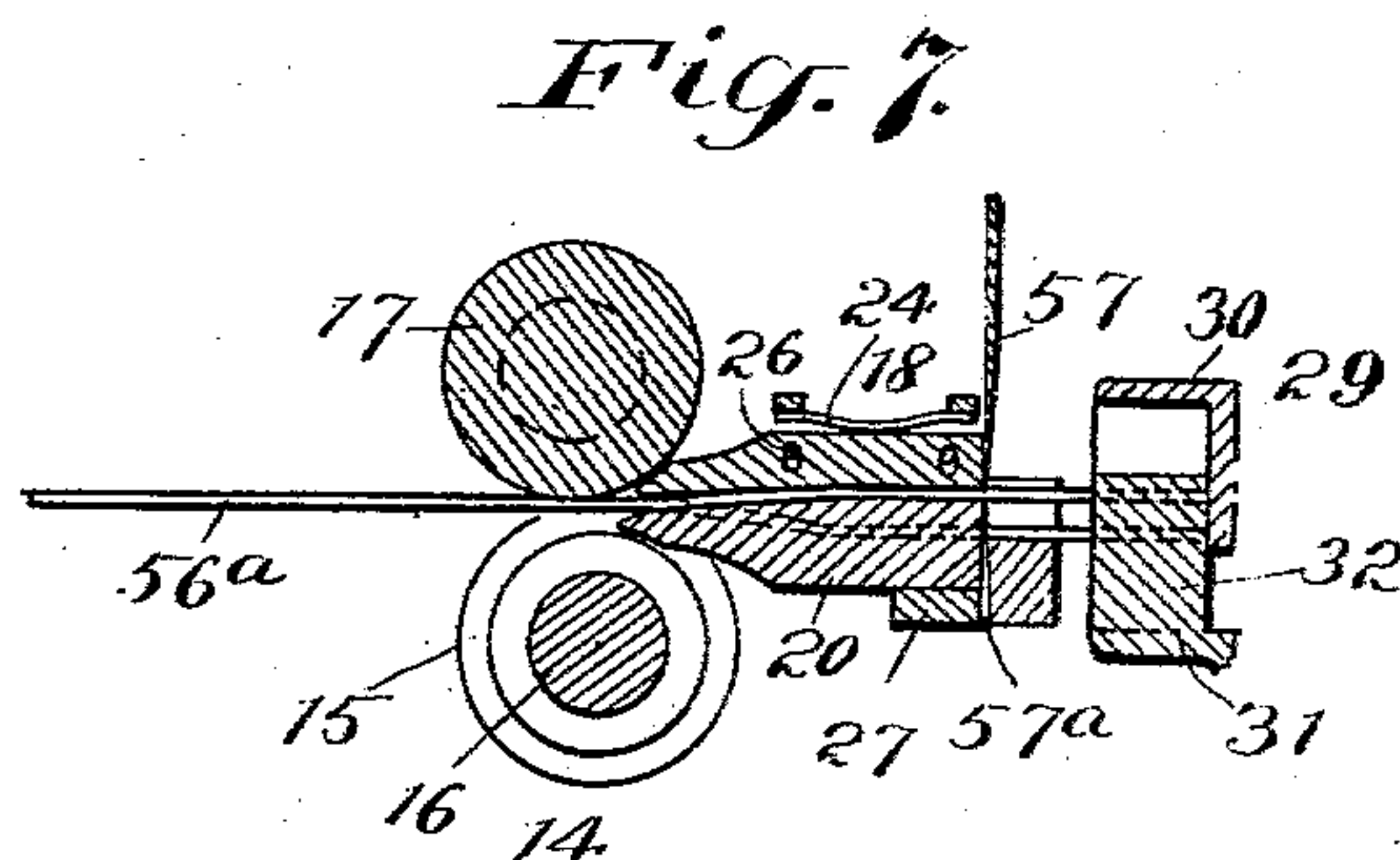
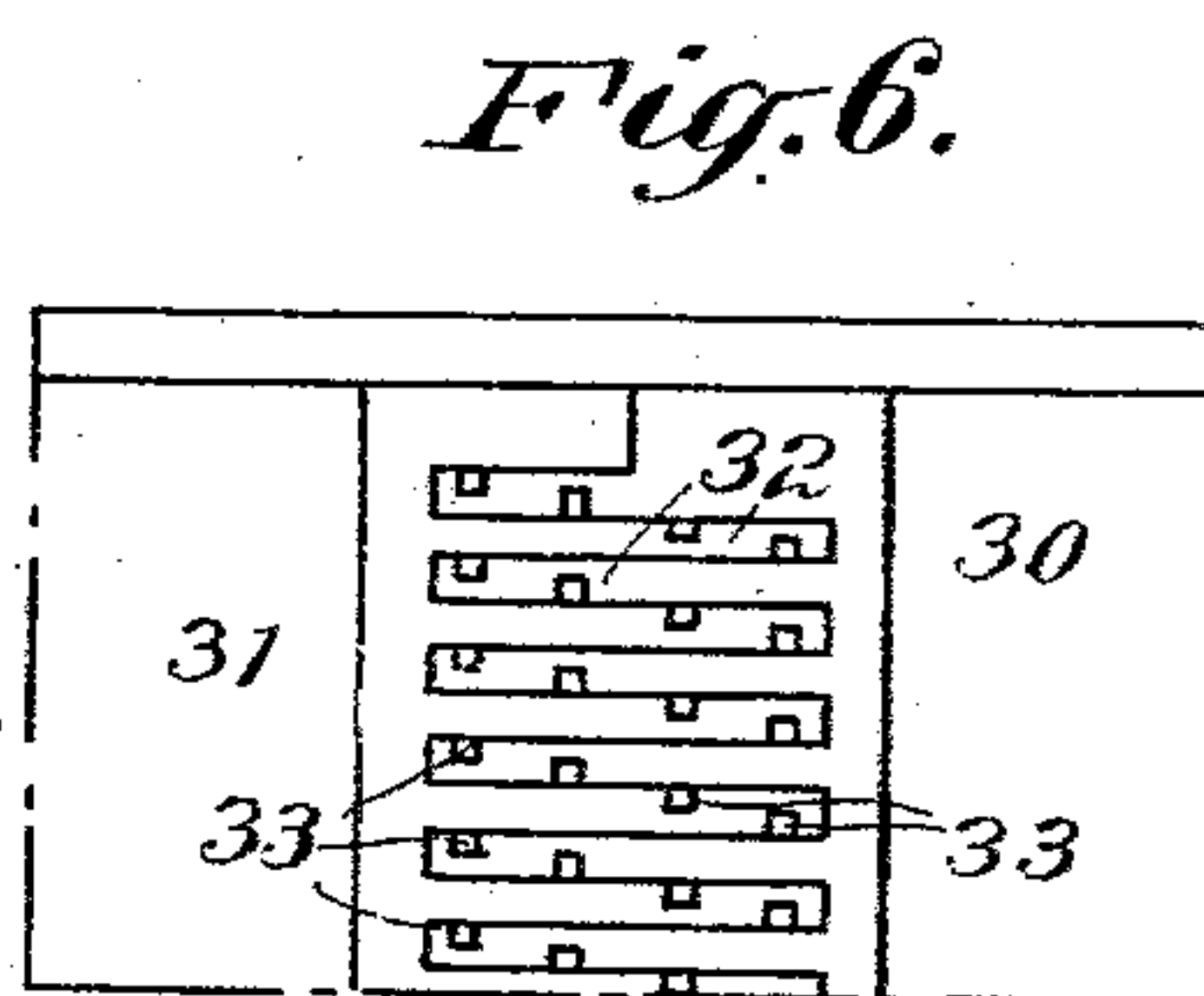
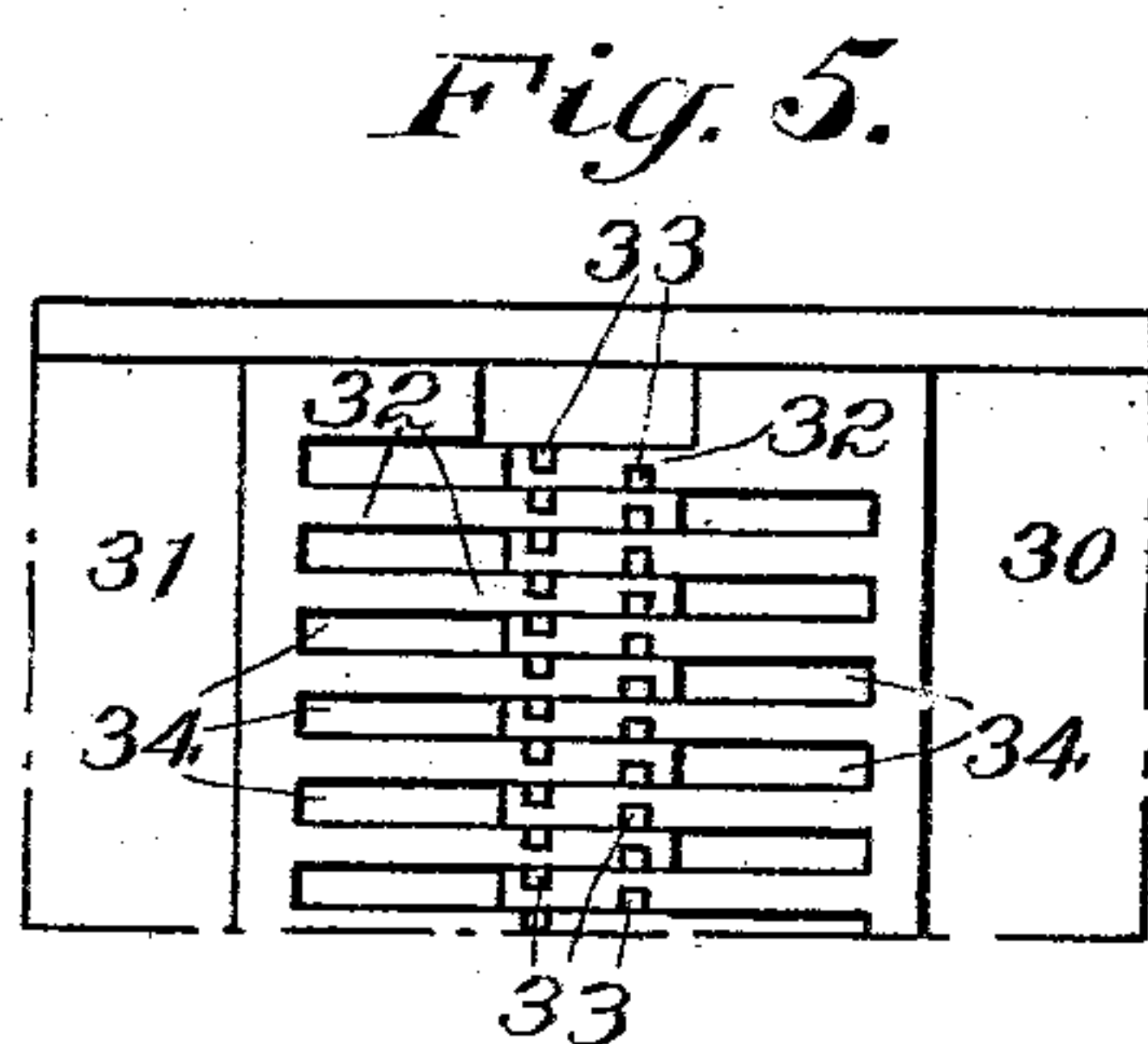
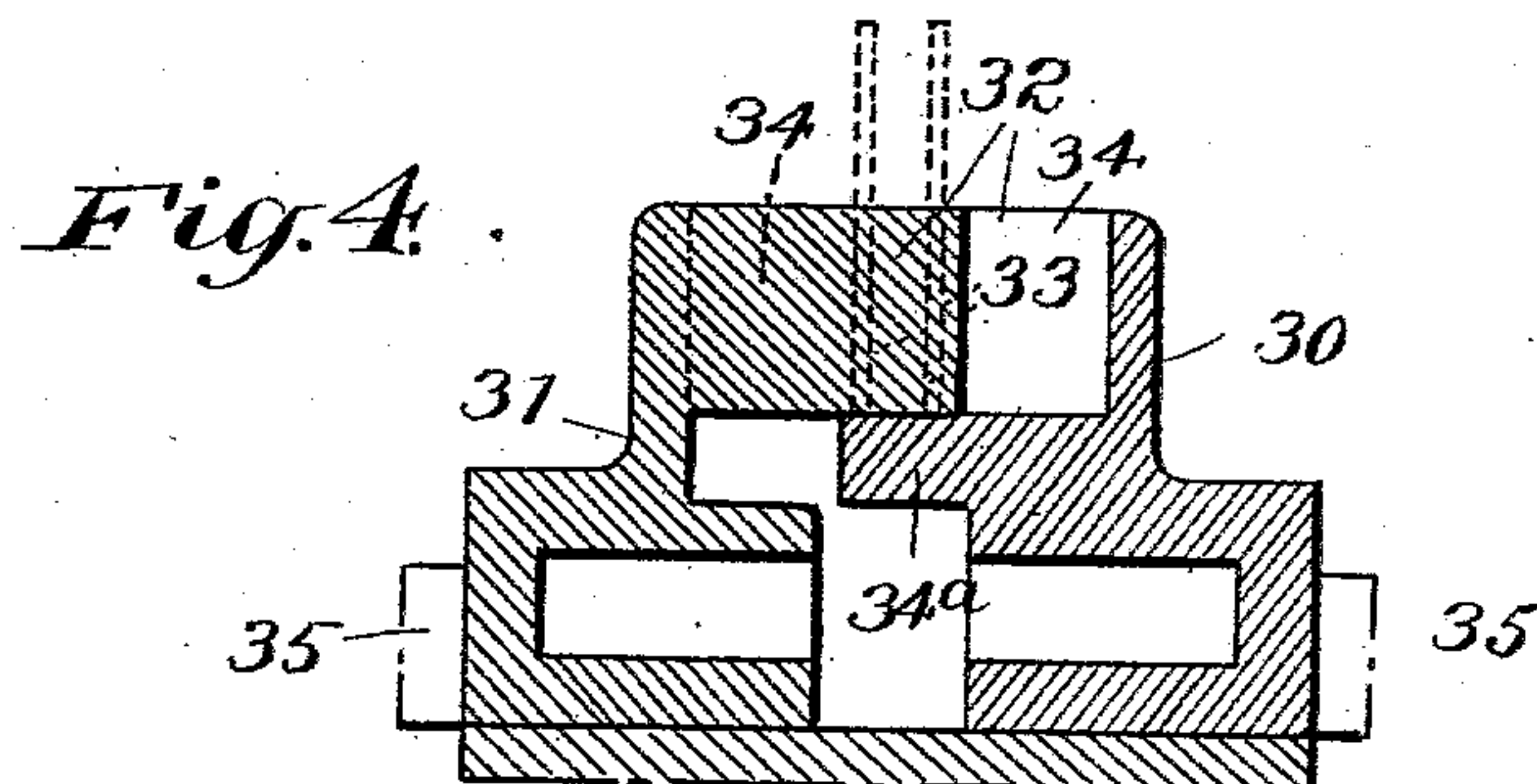
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WITNESSES:

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UNITED STATES PATENT OFFICE.

JAMES A. EKin CRISWELL, OF NEW YORK, N. Y.

MACHINE FOR MAKING MATCHES.

SPECIFICATION forming part of Letters Patent No. 716,824, dated December 23, 1902.

Application filed September 5, 1901. Serial No. 74,346. (No model.)

To all whom it may concern:

Be it known that I, JAMES A. EKin CRISWELL, of New York, county of Kings, city and State of New York, have invented certain new and useful Improvements in Machines for Making Matches, of which the following is a full, clear, and exact description.

This invention relates to match-making machines, and more particularly to machines such as are disclosed in my Patent No. 656,014, dated August 14, 1900, and in my application, Serial No. 71,974, dated August 13, 1901, in which the splints are cut from veneer.

The main object of the invention is to provide simple and efficient means by which the splints may be cut from strips, cards, or blanks of veneer initially separated into independent rows and such rows carried clear of and away from the initial separating means and further separated and after the second separation forced into a suitable carrier or other holding means.

A further object of the invention is to provide simple and efficient means for initially separating the splints and a series of movable independent sections receiving the separated splints from the initial separating means, which together separate the splints into more than two independent rows in position to be discharged into a suitable carrier.

With these and other objects in view the invention consists in the construction and combination of the parts, substantially as hereinafter described and then pointed out in the claims at the end of the description.

In the drawings, Figure 1 is a vertical section, partly in elevation, of the cutting and separating means for the splints, the section of the movable separating means being taken on the line I I of Fig. 2. Fig. 2 is a vertical section, partly in elevation, of the final separating means, taken on the line II II of Fig. 1. Fig. 3 shows another form of cutting device. Fig. 4 is an enlarged fragmentary section of the separator members. Fig. 5 is a fragmentary plan view of the separator members, the latter being in the position in which they receive the splints from the initial separating means. Fig. 6 is a fragmentary plan view of the separator members after they have been forced toward each other to further separate the splints. Fig. 7 shows how

long strips or blanks of veneer may be fed to a suitable cutting device, the long splints or splint strips initially separated, and the splint strips cut into complete splints by a second cutting device; and Fig. 8 is a fragmentary vertical section through another form of movable separating means.

The hopper 10 is suitably supported on the frame of the machine, and in said hopper are placed cards or blanks of veneer 11. These cards or blanks are of the thickness of the splints and of a width sufficient to provide a number thereof, and said cards are normally forced downward onto a plate or bed 12, in which position they are successively forced from the hopper by a plunger 13 to a cutting device 14. This cutting device comprises a series of circular cutters 15, arranged on a spindle or shaft 16. The cutters are spaced apart the width of the splints by means of suitable washers, and said cutters cut the splints against a preferably metallic roll 17. The splints as they are cut will be forced by the cutting device, with or without the assistance of the plunger device 13, into a suitable initial separating means 18. This separating means is fixed or stationary and comprises two members 19 and 20. The members are so constructed as to provide a single way, pass, or opening 21 in the path of the splints, from which diverge a series of channels, ways, or grooves 22, that form a continuation of the single way or pass and are adapted to divide the splints into two independent and parallel rows. The construction so far described is substantially the same as in my patent and may be of any suitable form or construction and may be arranged in any desired way.

The fixed initial separating means may have both members 19 and 20 rigidly held to the machine, or one of the members may be yieldingly held to the member 18 either as a whole or as independent plates. A spring or springs 24 for this purpose are properly held to the cross-bars 25, the member 19 or parts thereof being properly guided on the rods 26 in substantially the same manner as described in my pending application, Serial No. 54,618, dated April 6, 1901. The splints as they are forced through the initial separator member are suitably guided by fingers on the guide-bar 27, so as to be received by the separator 28.

To further separate the splints, various means may be employed. The movable member or separating means 28 comprises a series of independent sections 29, each section forming an independent separator. The sections 29 are each provided with two independently movable and slidable members 30 and 31, though instead of both members being movable one may be stationary. Each member is provided with a series of fingers or devices 32, in which are slots or openings 33, forming receivers for the splints. Each device 32 has two receivers, and said receivers are arranged to correspond to the position of the splints as they are received from the initial separating means. The devices 32 intermesh and when forced toward each other enter slots or recesses 34 in the members and divide the splints into four independent rows, as shown most clearly in Fig. 5, the inner ends of the splints normally resting against an abutment 34^a, carried by one of the members.

As a means for operating the members 30 and 31 of the final separating means the members are provided with arms 35, extending outward therefrom and have grooved connections 36 with the slides 37. The arms 35 are provided with sleeves or collars 38, that fit over and slide upon arms or rods 39. These arms or rods project outwardly from eccentric blocks or straps 40 and 41. The blocks 40 and 41 are similarly constructed and have their arms staggered and arranged at right angles with respect to each other, and the arms of one block are made to engage the sleeves of one member of each section, while the arms of the other block extend on opposite sides of the sections and engage the collars or sleeves 38 of each of the other members. These blocks or straps 40 and 41 are adapted to move around fixed or stationary eccentrics 42 and 43, respectively, and said eccentrics are held to a fixed part of the separator or of the frame, as by the stays or rods 44. The shaft 45 passes through the eccentrics 42 and 43 and has secured thereto wheels or other rotating means 46. These wheels have radial slots 47, in which the slides 37 are adapted to move, and said slides have ends or projections 48, that are adapted to normally move in annular grooves 49 in the disks or flanges 50. The disks or flanges 50 are provided with vertical slots, in which the bars 51 are adapted to be reciprocated by any suitable means. The bars 51 have grooves 52 therein, which normally register with the annular grooves 49 in the disks or flanges 50 and form a continuation thereof, and the bars have slots, as at 53, to properly span the shaft 45 to permit the bars 51 to be reciprocated.

As will be seen, the splints are received in two independent and parallel rows from the fixed separating means 18, and as the shaft 45 is rotated the wheels 46 will impart a circular movement to the sections 29. During this circular movement the ends 48 of the sections

will ride in the annular grooves 49, and the eccentric blocks or straps 40 and 41, while rotated around the fixed eccentrics 42 and 43, respectively, will force the members 30 and 31 toward each other and will separate the splints into four independent and parallel rows during the movement of the separator-sections from a horizontal to a vertical position. At this time the ends 48 of the slides 37 of the sections will enter the grooves 49 of the bars 51 and a quick reciprocatory movement is imparted to said bars, so as to force the slide 37 upward to stick or place the splints into the carrier 53^a, an abutment-plate 54 being provided to take the thrust of the carrier-plates during the sticking operation. The bars are returned to their former position and an intermittent one-quarter of a revolution is given the separating means 28, so as to successively place the independent sections in position to receive the splints from the initial separating means. As the plates or other holding means for the splints are filled they may be taken from the machine and the matches completed by hand or the plates or other holding means may be fed to and through the machine and the matches completed automatically in the usual or in any preferred manner. The construction of the operating mechanism for the members 30 and 31 of the sections 29 is substantially the same as in my application Serial No. 71,974, hereinbefore referred to.

In Fig. 3 the cutting device comprises two parallel spindles 55, on each of which are circular cutters 56. These cutters are beveled on one side and are made to overlap, and each set of cutters is spaced apart by suitable washers or otherwise equal to the thickness of the splints to be cut. This cutting device may feed the splints to the initial separating means, as 18, or said cutting device may be made so that one set of cutters will draw one-half of the splints in one direction and the other set of cutters the other half of the splints in the other direction, and the parts may be so arranged and constructed that these splints in independent rows as separated by the cutters may be forced into the final separating means.

In Fig. 7 long blanks or strips 56^a are fed to the cutting device, and said blanks cut into long splints or splint strips, which are initially separated into two independent rows, as already described. These splint strips will be cut into complete splints by a reciprocating or other knife 57, and preferably while held between members 30 and 31, a slot, as 57^a, being provided in the guide-bar 27 to permit the knife to enter therein and properly cut the splints.

The members 58 and 59 of the separator (shown in Fig. 8) have teeth on their lower surface, which are engaged by gears on the shafts 60 and 61, respectively. The gears are operated from the shaft 62, and the splints are separated and forced into the carrier in

substantially the same manner as described in my application Serial No. 71,974.

From the foregoing it will be seen that simple and efficient means is provided whereby the splints may be initially separated into independent rows and such rows carried bodily and further separated and by the separating means forced into a suitable carrier or other holding device.

It will be understood that the particular devices employed for separating the splints may be varied or that instead of the two members being movable with respect to each other, as shown, one of said members may be fixed to the separator and the other independently movable relatively thereto, and instead of the final separating means comprising a series of four independent sections it may comprise a single section or other number constructed and operated in any desired manner or as in my application Serial No. 71,974, previously referred to.

The class of machinery herein shown and described is broadly claimed in my patent hereinbefore referred to and in my pending application, Serial No. 737,186, filed November 16, 1899, and other pending applications, particularly Serial No. 45,044, filed January 28, 1901, Serial No. 54,618, filed April 6, 1901, and Serial No. 57,535, filed April 26, 1901, in which latter application initial and further separating means is broadly claimed.

By the term "veneer" it will be understood that wood veneer or any material from which splints may be made is included, and while a particular kind of splints is shown the latter may be of any suitable shape according to the various means that may be employed for producing them.

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

1. In a match-making machine, the combination with splint-cutting means, of fixed separating means receiving the splints endwise and dividing them into independent rows, and revoluble means receiving the independent rows of splints and further separating them, and holding means for the splints.

2. In a match-making machine, the combination with splint-cutting means, of fixed or stationary means receiving the splints endwise in a common plane and dividing them into independent rows, and revoluble means receiving the independent rows of splints and dividing them into a greater number of independent rows, and holding means for the splints.

3. In a match-making machine, the combination with splint-cutting means, of fixed separating means receiving the splints endwise and dividing them into independent rows, a separator having a series of intermittently circularly moving independent sections each receiving the independent rows of splints and carrying them bodily at once away from and clear of the cutting means and further separating such rows, and holding means for the

splints receiving the latter from the sections.

4. In a match-making machine, the combination with initial separating means, of a movable section receiving the initially-separated splints and further separating them, a carrier, together with means for moving the section to stick and leave the splints in the carrier.

5. In a match-making machine, the combination with splint-cutting means, of initial separating means, a series of intermittently-movable sections each receiving the separated splints and further separating them, and holding means for the splints.

6. In a match-making machine, the combination with means for initially separating the splints, and a movable section receiving the separated splints and further separating them, a carrier, and means for moving the section to stick and leave the splints in the carrier.

7. In a match-making machine, the combination with initial separating means for the splints, of a series of independent movable sections each receiving the separated splints in succession, a carrier, and means for successively moving the sections to force and leave the splints in the carrier.

8. In a match-making machine, the combination with fixed or stationary means receiving the splints endwise in a common plane and dividing them into independent rows, and a series of independent and revoluble sections each receiving in succession the independent rows of splints from the initial separating means and further separating them into a greater number of independent rows, a carrier, together with means for reciprocating the sections to force and leave the splints in the carrier.

9. In match-making machinery, the combination with splint-cutting means, of fixed separating means receiving the splints endwise direct from the cutting means and separating them into independent rows, and a series of independent and revoluble and reciprocatory sections receiving the independent rows of splints from the fixed separating means and separating said rows into a greater number of independent rows, holding means for the splints, together with means for reciprocating the sections to stick and leave the splints in the holding means.

10. In match-making machinery, the combination with splint-cutting means, of fixed separating means receiving the splints endwise in a common plane and dividing them into independent rows, and revoluble and reciprocatory means receiving the independent rows of splints and further separating them, and holding means for the splints.

11. In match-making machinery, the combination with initial separating means for the splints, of a series of revoluble and reciprocatory sections receiving the separated splints from the initial separating means endwise and carrying the separated splints bodily and fur-

ther separating them, and a carrier receiving the splints from the sections during their reciprocatory movement.

12. In match-making machinery, the combination with initial separating means for the splints, a carrier, and a movable and reciprocatory section receiving the splints from the initial separating means and further separating them, and forcing or sticking the splints in the carrier.

13. In match-making machinery, the combination with initial separating means dividing the splints into independent rows, a carrier, and a movable and reciprocatory section receiving the splints endwise moving them bodily at once and separating them into a greater number of independent rows and forcing such rows into the carrier during the reciprocatory movement thereof.

14. In match-making machinery, the combination with means for supplying splints, of initial separating means dividing the splints into independent rows, a series of revoluble and reciprocatory sections receiving the independent rows direct from the initial separating means and further separating them into a greater number of independent rows, a carrier, together with means for reciprocating the sections to force and leave the splints in the carrier.

15. In a match-making machine, the combination with splint-cutting means, of a fixed initial separating means having a single way, pass or opening receiving the splints direct from the cutting means and independent rows of independent channels forming a continuation of the single way or pass and dividing the splints into independent rows, and a series of independent revoluble and reciprocatory sections receiving the independent rows of splints endwise from the initial separating means, a carrier, together with means for reciprocating the sections to force and leave the separated splints in the carrier.

16. In match-making machinery, the combination with means for initially separating the splints, of a movable and reciprocatory section having two members provided with intermeshing devices each forming receivers for a splint of each row received from the initial separating means, means for moving the members so as to further separate the splints, and holding means for the splints.

17. In match-making machinery, the combination with initial separating means for the splints, dividing the latter into two independent rows, of a series of revoluble independent sections each provided with two movable members having intermeshing devices each device receiving an independent splint of each of the rows received from the initial separating means, means for moving the members toward each other to separate the splints into a greater number of independent rows, and holding means for the splints.

18. In match-making machinery, the combination with means for initially separating the splints, of a movable and reciprocatory section having two members provided with intermeshing devices each forming receivers for a splint of each row received from the initial separating means, means for moving the members so as to further separate the splints, holding means for the splints, together with means for reciprocating the sections to force and leave the splints in the holding means.

19. In match-making machinery, the combination with initial separating means for the splints dividing the latter into two independent rows, of a series of revoluble independent sections each provided with two movable members having intermeshing devices each device receiving an independent splint of each of the rows received from the initial separating means, means for moving the members toward each other to separate the splints into a greater number of independent rows, holding means for the splints, together with means for reciprocating the sections to force and leave the splints in the holding means.

20. In match-making machinery, the combination with a splint-cutting device, of means initially separating the splints into two independent rows, a second cutting device cutting the splints transversely to form complete splints, a carrier, and a series of revoluble and reciprocatory sections receiving the splints from the initial separating means and further separating them, and means for successively reciprocating the sections to force and leave the splints in the carrier.

21. In match-making machinery, the combination with splint-cutting means, means for initially separating the splints, and a series of independent revoluble sections receiving the splints from the initial separating means and further separating them during their revoluble movement, each section being provided with two bodily-movable members for further separating the splints, a carrier, together with means for reciprocating the sections to force and leave the splints in the carrier.

22. In match-making machinery, the combination with splint-cutting means, means for initially separating the splints and a series of independent revoluble sections receiving the splints from the initial separating means and further separating them during their revoluble movement, each section being provided with relatively movable and stationary members for further separating the splints, a carrier, together with means for reciprocating the sections to force and leave the splints in the carrier.

JAMES A. EKIN CRISWELL.

Witnesses:

CHAS. E. RIORDON,
KARL J. DANIEL.