Jan. 2, 1923. 1,440,383

O. C. FENLASON.

VARIABLE FEED FOR VENEER JOINTERS AND THE LIKE.

FILED DEC. 5, 1921.

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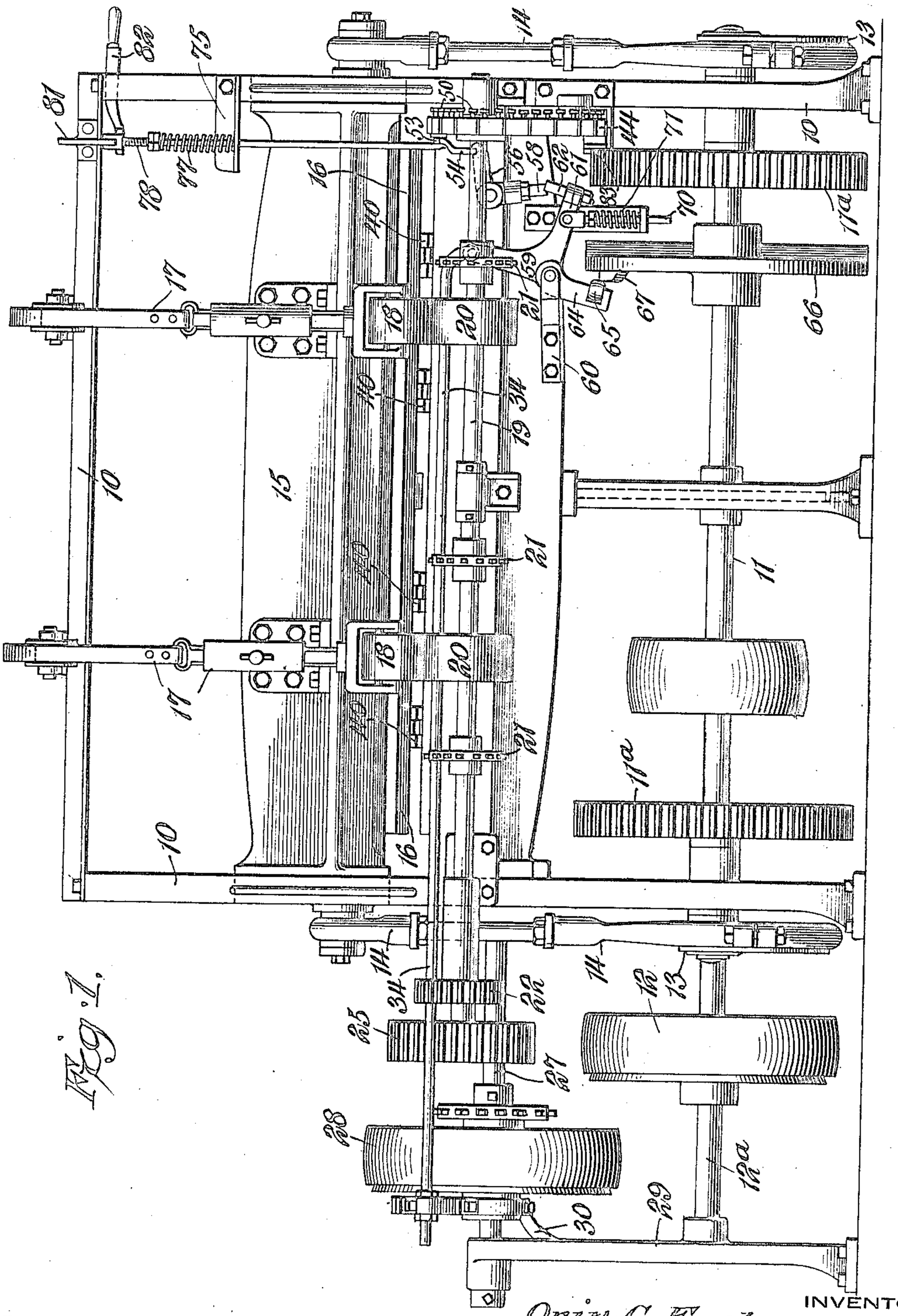

Fig. 1.

WITNESSES

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3 SHEETS-SHEET 2

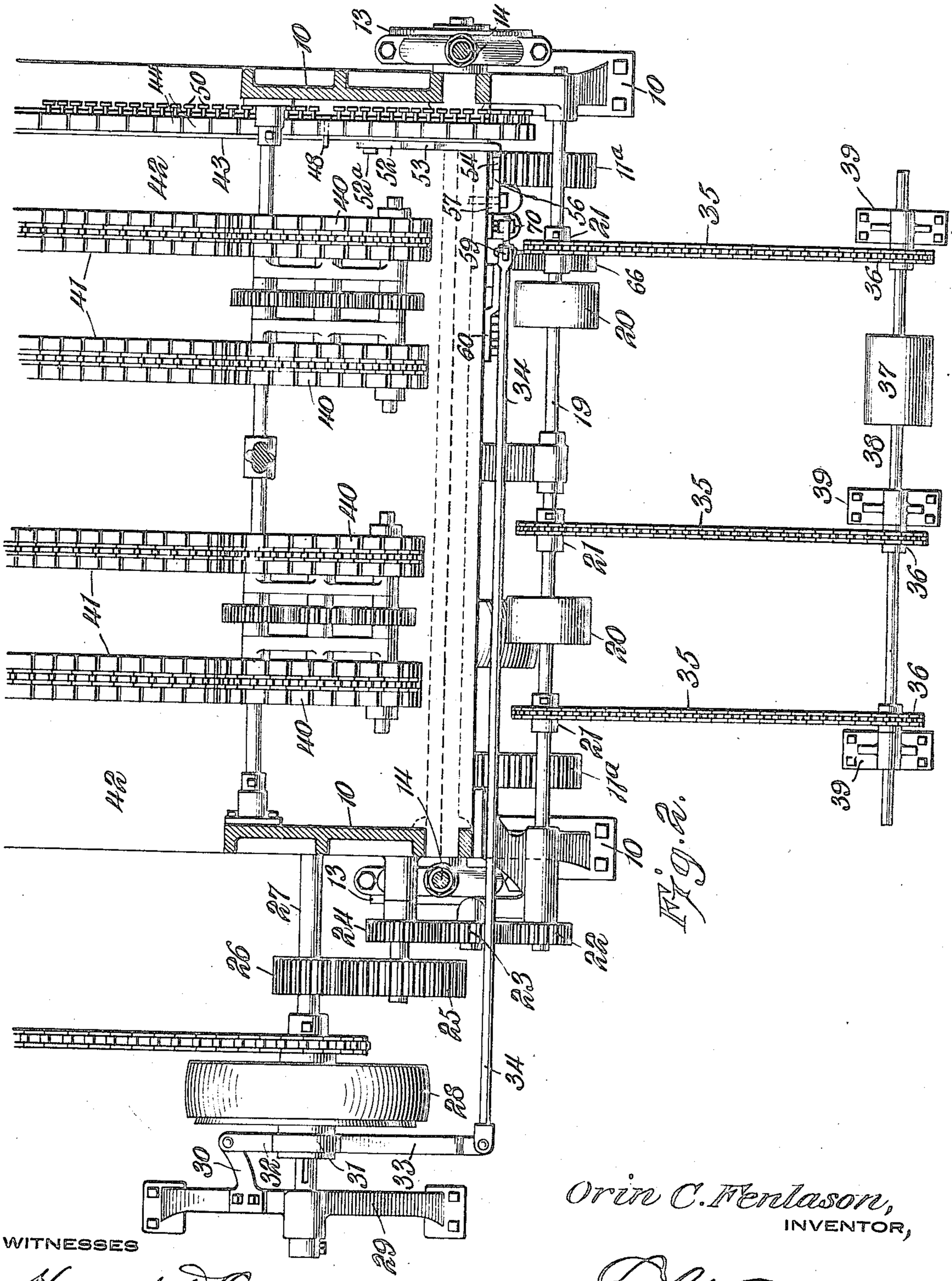

FIG. 2.

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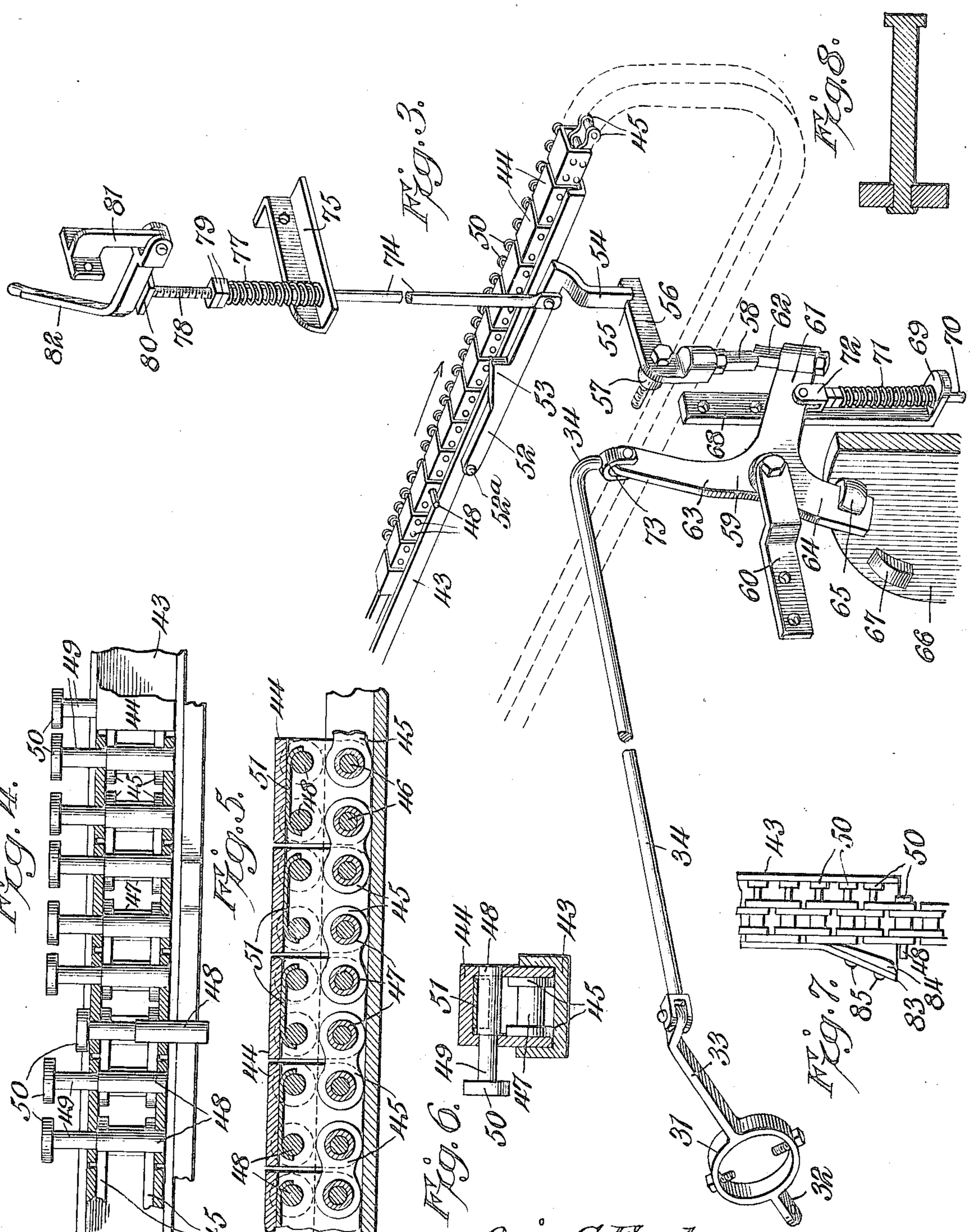
3 SHEETS-SHEET 3



WITNESSES

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UNITED STATES PATENT OFFICE.

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VARIABLE FEED FOR VENEER JOINTERS AND THE LIKE.

Application filed December 5, 1921. Serial No. 520,104.

To all whom it may concern:

Be it known that I, ORIN C. FENLASON, a citizen of the United States, residing at Portland, in the county of Multnomah and State of Oregon, have invented new and useful Improvements in Variable Feeds for Veneer Jointers and the like, of which the following is a specification.

This invention relates to a variable feed mechanism capable of being used on many different types of machines, such as wire bound stapling machines, and paper carton machines, but especially designed for use with veneer jointers.

There is a great demand for sheets of clear veneer of various widths for door panels and other laminated stock. It is a common practice to glue two or more sheets of veneer together, with adjacent sheets having the grains running at right angles so as to make one good, substantial panel out of several plies of veneer, which panel will not buckle, warp, check or shrink. The clear sheets of veneer are used as the outside facing sheets while the coarser sheets having knots, knotholes, pitch pockets and other defects, are used in the center of the laminated panel as core stock.

In the process of cutting veneer, a log or bolt is chucked in a veneer lathe, and is revolved against a knife, the veneer thus being severed from the log or bolt in one continuous strip, much the same as a curtain shade is unrolled off the curtain roller. From such sheets of veneer the the defects are cut out in such a manner as to get as much wide, clear stock as possible. It is for a machine adapted to joint or cut the sheets of various widths that the present invention is particularly designed. The object of the invention is to provide an automatic, intermittent, variable feed enabling an operator to cut out the defects and joint sheets of any desired width while the veneer is in transit.

There are some jointers in use having either a hand feed or a power hand feed for cutting variable widths. There are also automatic jointer feeds that will joint automatically any width from 1 inch to 24 inches; but the sheets will all be of uniform widths as the feed will joint only one width uniformly unless the mechanism is reset for other widths. The present feed will joint any width, any time, at the will of the operator without stopping the machine or changing the feed mechanism.

The preferred embodiment of the invention employs a special form of flexible carrier having pins or similar movable elements which are capable of being pushed out individually by the operator at any desired place where he wishes to cut the sheet of veneer. The mechanism is equally well adapted to be used in connection with machines cutting sheets of paper, driving staples, or doing various other kinds of work. As soon as the pin or other movable element which has been shoved into the desired position comes in alinement with the knife, the feed works will cease to feed. After the feeding ceases, the knife cuts through the sheet and then is raised a short distance whereupon the feed works will be set in motion and will keep in motion until another pin comes in alinement with the knife, whereupon the operation is repeated. The special chain runs at the same rate of speed as the feed chains of the jointer which carry the sheets of veneer toward the knife.

The present invention is believed to be broadly new in the provision of a special feed chain or other flexible member having movable members such as pins, which can be adjusted at the will of the operator whether the chain is in motion or is standing still without the loss of time. In accordance with the adjustment of these pins the stock is jointed in widths conforming to the distances between the pins or the movable members. The special chain with its movable members running synchronously and at the same speed with the feed chains constitutes an important part of the present invention.

The invention will be best understood from a consideration of the following detailed description taken in connection with the accompanying drawing forming part of this specification, with the understanding, however, that the invention is not confined to any strict conformity with the showing in the drawing, but may be changed and modified so long as such changes and modifications mark no material departure from the salient features of the invention as expressed in the appended claims.

In the drawing:

Figure 1 is a front elevation of a modern type of veneer jointer showing an embodi-

ment of the invention applied, the parts not necessary for an understanding of the invention being omitted;

Fig. 2 is a top plan view of the same with parts in horizontal section;

Fig. 3 is a perspective view showing the improved variable feed mechanism separated from the rest of the machine;

Fig. 4 is a detail view partly in cross section of the feed actuating chain;

Fig. 5 is a view of the parts shown in Fig. 4, with the section at right angles;

Fig. 6 is a transverse section through the chain and race;

Fig. 7 is a detail showing the removable wedge provided to push the pins of the feed actuating chain back in place;

Fig. 8 is a detail showing a modified form of pin.

The numeral 10 designates the main frame of the machine. A horizontal shaft 11 is suitably journaled in the lower part of this frame. This drive shaft may be turned by a pinion (not shown) mounted on a shaft 12ª extending the width of the machine, which pinion meshes with a gear 11ª. The shaft 12ª also carries a friction pulley 12, which may be driven by any desired motor. Either end of the shaft 11 has a crank disk 13 mounted thereon and to each crank disk a pitman 14 is connected. The upper ends of the two pitmen are joined to the knife beam 15 reciprocably mounted in the frame 10. A knife 16 is carried at the lower edge of the beam 15. This knife is adapted to cut the sheets of veneer at regular intervals or at the points selected by the operator. It will be understood from the foregoing that when the friction of pulley 12 is thrown in, the knife beam will be reciprocated.

The illustrated type of jointer employs an "outfeed" device, which feeds out the last sheet of veneer that is being jointed. This device lifts a plurality of rollers 18 as the knife beam 15 descends. These rollers 18, unless lifted, rest upon rollers 20 in turn carried by a shaft 19. Sprockets 21 are also mounted on the shaft 19. This shaft is journaled in the frame, as best seen from Fig. 2, and at one end has a gear 22. This gear meshes with an idler 23, in turn connected with a gear 24 mounted upon the same shaft with a gear 25. The gear 25 meshes with a pinion 26, mounted on a shaft 27. Upon this shaft is also mounted a friction pulley 28 suitably connected with a source of power. An auxiliary frame or stand 29 supports the outer end of the shaft 27. This stand has an arm or bracket 30 providing a support for a lever, which is fixed to the friction of pulley 28. As best seen in Fig. 3, this lever includes a short portion 32 and a long portion 33, with a yoke 31 intermediate the same. This yoke is joined to the friction so that rocking of the lever in one direction separates the friction from lever 28, while swinging of the lever in the opposite direction engages the pulley with the friction, so that the shaft 27 is turned. The outer end of portion 33 is pivotally connected to a rod 34.

As shown in Fig. 2, the machine is provided with an out-bearing table, which carries the sheets of veneer away from the knife when they have been jointed or cut off. This table is formed by the several chains 35 meshing with the sprockets 21 and driven thereby and also meshed with sprockets 36 mounted on a countershaft 38 spaced from the machine proper. This countershaft is supported by a plurality of stands 39 and carries one or more rollers 37 which, in conjunction with the chains, carry the veneer sheets away from the machine.

The jointer has a plurality of top feed chains 40, which override the sheets of veneer and help to feed them as they approach the knife. The machine has a table 42 for supporting the sheets and a plurality of feed chains 41 extending slightly above the top of the table, so as to support and carry the sheets in the direction of the knife. Obviously, two or more separate sheets of veneer may be fed together by the feed chains and jointed. Since, however, the defects in one sheet will not ordinarily occur, in the same places as the defects in the other sheet it is usually desirable to feed a single sheet at a time.

Extending along the table at one side thereof, is a chain race 43, provided for a feed actuating chain, the construction of which is most clearly shown in Figs. 4, 5 and 6. This chain is an endless one and embodies links 44, preferably rectangular, and open on one side and at both ends. Thus each link 44 may be described as U-shaped. These links are joined by plates 45, there being two plates connected to each of two adjacent links. Pins 46 pass through sleeves 47 and pivotally connect each pair of plates 45 with each of two links 44. The plates 45 run in the bottom of the race 43, which is also U-shaped in cross section and receives the lower half of the feed actuating chain. The pins 46 are secured at their ends to the links.

Each of the links 44 has a plurality of bores in the sides thereof, the bores on opposite sides being in alinement but the bores on one side having a less diameter than those on the opposite side. Pins are passed through the alined bores in each link, two pins preferably being employed for every link of the chain. These pins have a shank 48 and a head 50, the shank having a reduced portion 49. This reduced portion is received in one of the smaller bores, provided in the sides of the link. The pin is

reciprocable in the bores which receive it but is prevented from falling off the link by the head 50 and by the annular shoulder provided at the junction point of portions 48 and 49 of the shank.

As seen in Fig. 4 any one of the adjustable pins may be pushed so that its shank 48 extends out beyond the inner side of the race. A spring 51 is driven between the link and the two push pins, which are carried by each link. This spring is provided for the purpose of holding the push pins in their extended or retracted position.

A sprocket wheel (not shown) is mounted on shaft 19 at the end remote from gear 22 and engages the feed actuating chain to drive the same synchronously with, and at the same speed as, the feed chains 41 and 40.

Fig. 8 shows a second type of pin which may be used with a chain very similar to the one which has been described. Obviously the shape of the pins employed is a mere matter of choice. Instead of pins, many other devices might be used, such as bolts, buttons, hinges, etc. The invention is entirely independent of what particular form of movable elements are employed upon the feed actuating chain.

Pivotally mounted upon the chain race, as at 52ª, is a pawl 52 having a tooth 53 intermediate its ends. At the end remote from the pivot, this pawl carries a depending extension arm 54. A notch 55 is provided in one arm 56 of a bell crank lever for the purpose of receiving the lower end of the arm 54. This bell crank lever is pivoted, as at 57, upon the frame of the machine. The other arm of this bell crank lever carries a trigger pin 58, adapted to engage with a second trigger pin 62, carried by an arm 61 of a three armed or Y lever 59. The Y lever is pivotally mounted upon a strap 60 secured to the machine frame. This Y lever has another arm 64 carrying a roller 65. A disk 66 mounted on shaft 11 is provided with a lug 67 on one face near the periphery, whereby upon rotation of this disk the lug engages with the roller 65 so as to rock the Y lever about its pivot. The Y lever also has a third arm 63 pivotally connected at its outer end with a bifurcated end 73 of rod 34. A bar 68 is fast to the frame and has an ear 69 at the lower end. This ear is perforated to slidably receive a rod 70, which is bifurcated at its upper end, as at 72, and is pivotally connected with arm 61. A coil spring 71 is mounted on rod 70 between ear 69 and the bifurcation 72. This coil spring tends to throw the arm 64 with its roller toward the disk 66, and the arm 61 upwardly.

The pawl 52 is pivotally connected to a lift rod 74 which passes through an angle bar 75 secured to the machine frame at a high point thereof. The upper end of rod 74 is screw-threaded, as indicated at 78, and the extremity thereof is provided with a head 80. A coil spring 77 surrounds the rod 74 and bears at its lower end against the angle bar 75. The tension of the spring is adjusted by nuts 79 movable along the screw-threaded section 78 of the rod. A bracket 81 is mounted upon the frame and provides a support for a hand lever 82. This hand lever is adapted to rest upon the head 80, so that upon pulling down this lever, the pawl 52 may be depressed to cause stopping of the work, as will be described.

Fig. 7 shows a portion of the chain race having a wide or flaring end 83, in which is removably secured a wedge 84 by fastening elements 85. After the push pins have been thrust outwardly as shown in the drawing, they will be moved back to their original positions by engagement with the wedge 84. This will be done automatically as long as the wedge is in position; but if desired the wedge may be removed, whereupon the feed actuating chain will cause automatic jointing of the veneer sheets to take place at fixed and regular time intervals.

When one of the push pins has been moved by the operator so that its shank 48 protrudes beyond the edge of the chain race, this pin will engage with the tooth 53 of the pawl 52 causing downward movement of the latter. The movement may be caused by pulling lever 82. This downward movement of pawl 52 will swing the trigger pin 58 out of engagement with the trigger pin 62. The spring 71 will move the arm 61 upwardly, whereupon the roller 65 will be brought into engagement with the side of disk 66. At the same time, the rod 34 will be moved so as to release the friction clutch of pulley 28; then the feed mechanism stops, whereupon the veneer stands still. The knife 16 will descend and cut off the sheet of veneer in alinement with the particular push pin which was selected by the operator. As the knife rises, the lug 67 engages with the roller 65, and thereby swings the arm 61 downwardly so that the trigger pin 62 is engaged under the trigger pin 58. The spring 77 causes the arm 54 to be seated in the notch 55. At the same time that the arm 61 descends the friction pulley will be thrown in, thus starting the feed mechanism, which continues to feed the veneer until the pawl is again depressed.

What is claimed is:—

1. A variable feed mechanism including a flexible element, means for driving the same, adjustable means carried on said element, and means engaged by said adjustable means when the latter is in a certain position relative to the flexible element for causing stopping of the driving means and consequently of the flexible element.

2. A variable feed mechanism for machines having a work support, work conveying means, and means adapted to operate on said work, comprising a flexible element driven by the same source of power which actuates the conveying means, means for breaking connection between this source of power and the work conveying means, said latter means being operable either manually by the operator or automatically by the flexible element.

3. A variable feed mechanism including a flexible element, means for driving the same in one direction, conveyer means driven synchronously with said flexible element and at the same speed, a plurality of adjustable means mounted at regular intervals on said flexible element and movable transversely with respect thereto, means actuated by any one of said adjustable means for effecting stopping of both the flexible and the conveyer means.

4. A variable feed mechanism including an endless flexible element, means for driving the same in one direction, conveyer means driven synchronously and at the same speed with said flexible element, a plurality of adjustable means mounted at regular intervals throughout the entire length of the flexible element, means for holding the adjustable means in any desired position, means actuated by contact with any one of said adjustable means when it has been moved into a certain position relative to the flexible element for cutting off the power from the conveyer means.

5. A variable feed mechanism including an endless flexible element, means for driving the same in one direction, conveyer means driven synchronously and at the same speed with said flexible element, a plurality of adjustable means mounted at regular intervals throughout the entire length of the flexible element, means actuated by contact with any one of said adjustable means when it has been moved into a certain position relative to the flexible element for cutting off the power from the conveyer means, and means for automatically restoring the displaced adjustable means after the flexible elements and conveyer resume their movement.

6. A variable feed mechanism including an endless flexible element, means for driving the same in one direction, conveyer means driven synchronously and at the same speed with said flexible element, a plurality of adjustable means mounted at regular intervals throughout the entire length of the flexible element, means actuated by contact with any one of said adjustable means when it has been moved into a certain position relative to the flexible element for cutting off the power from the conveyer means, and means for restoring the power cut-off means to its original position so that it may be actuated by any one of the succeeding adjustable means to again effect stopping of the conveyer.

7. A variable feed mechanism including an endless flexible element, means for driving the same in one direction, conveyer means driven synchronously and at the same speed with said flexible element, a plurality of adjustable means mounted at regular intervals throughout the entire length of the flexible element, means actuated by contact with any one of said adjustable means when it has been moved into a certain position relative to the flexible element for cutting off the power from the conveyer means, means for automatically restoring the displaced adjustable means to its normal position after the flexible element and conveyer resume their movement, and means for causing the power cut-off means to resume its original position so that it may be actuated by any one of the succeeding adjustable means to again effect stoppage of the conveyer.

8. A variable feed mechanism for machines having a work support, work conveying means, and means adapted to operate on said work, said mechanism comprising a flexible element carrying adjustable parts and driven by the same source of power which actuates the conveying means, means for breaking connection between this source of power and the conveying means, said latter means being operable by contact with the adjustable parts on the flexible element.

9. A variable feed mechanism for machines having a work support, work conveying means, and means adapted to operate on said work, comprising a flexible element driven by the same source of power which actuate the conveying means, means for breaking connection between this source of power and the conveying means, means on said flexible element adjustable when the latter is moving or is at rest for contact with the power cut-off means to actuate the same automatically, and mechanism for actuating said power cut-off means manually.

10. A variable feed mechanism for machines having a work support, work conveying means, and means adapted to operate on said work, comprising a flexible element driven by the same source of power which actuates the conveying means, means for breaking connection between this source of power and the conveying means, means on said flexible element adjustable when the latter is moving or is at rest for contact with the power cut-off means to actuate the same automatically, and means for restoring the adjustable means to its original inactive position after travel of the flexible element is resumed.

11. A variable feed mechanism for ma-

chines having a work support, work conveying means, and means adapted to operate on said work, comprising a flexible element driven by the same source of power which actuates the conveying means, means for breaking connection between this source of power and the conveying means, means on said flexible element adjustable when the latter is moving or is at rest for contact with the power cut-off means to actuate the same automatically, and means for automatically restoring the power cut-off means to a position such that it may be encountered by any one of the succeeding adjustable means.

12. A variable feed mechanism for machines having a work support, work conveying means, and means adapted to operate on said work, comprising a flexible element driven by the same source of power which actuates the conveying means, means for breaking connection between this source of power and the conveying means, means on said flexible element adjustable when the latter is moving or is at rest for contact with the power cut-off means to actuate the same automatically, means for automatically restoring the displaced adjustable means to their original or inactive position following the resumption of motion upon the part of the flexible element, and means for automatically moving the power cut-off means into a position such that it may be engaged by any one of the succeeding displaced adjustable means.

13. A variable feed mechanism including a chain; means for driving the chain, adjustable means carried upon said chain, and means engaged by said adjustable means when the latter is in a certain position relative to the chain and when it has reached a certain point in the course of its travel for causing stopping of the driving means.

14. A variable feed mechanism for machines having a work support, work conveying means, and means adapted to operate on said work, comprising a chain driven by the same source of power which actuates the conveying means, a plurality of adjustable means carried by the chain, means for cutting off connection between this source of power and the conveying means, said latter means being operable automatically by the chain carried means.

15. A variable feed mechanism including a chain, means for driving the same in one direction, conveyer means driven synchronously with said chain and at the same speed, a plurality of adjustable pins mounted at regular intervals on said chain and movable transversely with respect thereto, and means actuated by engagement with any one of said pins for effecting stopping of both the flexible element and the conveyer means.

16. A variable feed mechanism including an endless chain, means for driving the same in one direction, conveyer means driven synchronously and at the same speed with said chain, a plurality of adjustable elements mounted at regular intervals throughout the entire length of the chain, means for holding the adjustable elements in any desired position within the limits of their adjustment, means actuated by contact with any one of said adjustable elements when it has been moved into a certain position relative to the chain for cutting off power from the conveyer means.

17. A variable feed mechanism including an endless chain, means for driving the same in one direction, conveyer means driven synchronously and at the same speed with said chain, a plurality of adjustable pins mounted at regular intervals on the links of said chain, means actuated by contact with any one of said adjustable pins when it has been moved into a projecting position relative to one side of the chain for cutting off the power from the conveyer means, and means for automatically restoring the displaced adjustable pin to its original position after the chain and conveyer resume their motion.

18. A variable feed mechanism including an endless chain, means for driving the same in one direction, a work conveyer driven synchronously and at the same speed with said chain, a plurality of adjustable pins mounted at regular intervals throughout the entire length of the flexible conveyer, said means being slidable transversely of the chain, means for holding the pins in adjusted position, means actuated by contact with any one of said adjustable pins when it has been moved into a certain position relative to the flexible element and has reached a certain point in its path for cutting off the power from the conveying means, and means for restoring the power cut-off means to its original position, so that it may be actuated by any one of the succeeding displaced adjustable pins to again effect stoppage of the conveyer.

19. A variable feed mechanism including an endless chain, means for driving the same in one direction, conveyer means driven synchronously and at the same speed and in the same direction with said chain, a plurality of pins mounted at regular intervals throughout the entire length of the flexible element, said pins being slidable transversely relative to the chain, means actuated by contact with any one of said pins when it has been moved into a certain position relative to the chain for causing stopping of the conveyer means, means for automatically restoring to its original position the displaced adjustable pin after the chain and conveyer resume their motion, and means for restoring the power cut-off means to its original position so that it will be actuated by any

one of the succeeding adjustable pins to again effect stoppage of the conveyer.

20. A variable feed mechanism for veneer jointers and like machines comprising a feed actuating chain, an adjustable movable element provided on each link of the chain, means for driving the chain, said means also driving the veneer conveyer, means actuated by contact with any one of said adjustable movable elements when it has reached a certain point in the course of its travel for cutting off the driving means, means for causing the knife beam of the machine to descend and rise again, and means for automatically connecting the driving means to the chain after the cut has been made.

21. A variable feed mechanism for veneer jointers and like machines, comprising a feed actuating chain, a plurality of pins projecting from the various links of the chain on either of two sides thereof, means for driving the chain, said means also driving the veneer conveyer, means actuated by contact with any one of said adjustable pins when it has reached a certain point in the course of its travel for cutting off the driving means, means for causing the knife beam of the machine to descend and rise again, and means for automatically connecting the driving means to the chain after the cut has been made.

22. A variable feed mechanism for veneer jointers and like machines comprising a feed actuating chain, an adjustable element provided on each link of the chain, means for driving the chain and also for driving the veneer conveyer, means actuated by contact with any one of said adjustable elements when it has reached a certain point in the course of its travel for cutting off the driving means, said adjustable elements being adjustable by the operator both when the machine is in motion and when it is at rest, means for actuating the knife beam of the machine, the parts being so arranged that the knife beam joints the veneer in alinement with that particular element which has been adjusted and after the chain has stopped, and means for automatically connecting the driving means to the chain after the cut has been made.

23. A variable feed mechanism for veneer jointers and like machines comprising an endless feed actuating chain, means for driving the chain in one direction, a pin mounted on each link of the chain and adjustable so as to project from either side of its link, the chain driving means also driving the veneer conveyer, means actuated by contact with any one of said pins when it projects from one side of the chain and when it reaches a certain point in its path for cutting off the driving means, whereby motion of the conveyer ceases, means for causing the knife beam of the machine to descend when the chain has stopped and to rise again, means for automatically connecting the driving means to the chain after the knife beam rises, and means for automatically restoring the power cut-off means to a position such that it may be actuated by any succeeding displaced pin.

24. A variable feed mechanism for veneer jointers and like machines comprising an endless feed actuating chain, means for driving the chain in one direction, said means also driving the veneer conveyer in the same direction and at the same speed with the chain, a pin provided upon each link of the chain and projectable from either of two sides of the link on which it is mounted, means actuated by contact with any one of said pins when projecting from one face of the chain and when it has reached a certain point in the course of its path for cutting off the driving means from the conveyer and consequently from the chain, means for causing the knife beam of the machine to descend to make a cut in the veneer and rise again, means for automatically connecting the driving means to the chain after the cut has been made, and means for automatically restoring the displaced pin to its original and inactive position after resumption of motion of the chain.

25. A variable feed mechanism for veneer jointers and like machines comprising an endless feed actuating chain, means for driving the chain in one direction, said means also driving the veneer conveyer in the same direction and at the same speed, a pin slidably mounted on each link of the chain, means for preventing motion of the pin when adjusted, means actuated by contact with any one of said means when adjusted and when it reaches a predetermined point in the course of its travel for cutting off the driving means from the chain and conveyer, means for causing the knife beam of the machine to descend and rise again, said knife beam making a cut in alinement with that particular pin which was adjusted, means for automatically connecting the driving means to the chain after the cut has been made, means for restoring the displaced or adjusted pin to its original or inactive position upon resumption of motion of the chain, and means for moving the power cut-off means to a position such that it may be again actuated by any one of the succeeding adjustable pins.

26. A feed actuating chain for veneer jointers and like machines, comprising a plurality of links, a pair of plates pivotally connected to each of two adjacent links, and adjustable elements mounted on said links and projectable manually from either of two sides of the same.

27. A feed actuating chain for veneer jointers and like machines, comprising a plu-

rality of links joined together in such manner that the chain may mesh with a sprocket wheel to be driven thereby, a pin slidable transversely on each link, said pin having a length greater than the width of said link, means for preventing motion of the pin beyond a certain point in either direction, and means for holding the pin in any position within the limits of its allowed motion.

28. A feed actuating chain for veneer jointers and like machines, comprising a plurality of links connected together so that the chain may be driven by a sprocket wheel, a pin mounted on each link, said pin comprising a shank, said shank having a section of reduced diameter, and a head at the end of said section, the shank and reduced section providing an annular shoulder, each link having alined bores in the sides thereof, one of said bores receiving the reduced section, the other bore receiving the shank, the annular shoulder preventing motion of the pin beyond a certain point in one direction and the head preventing motion beyond a certain point in the opposite direction.

29. A feed actuating chain for veneer jointers and like machines, comprising a plurality of links joined together in such manner that the chain may mesh with a sprocket wheel to be driven thereby, a pin slidable on each link, said pin having a length greater than the width of said link, means for preventing motion of the pin beyond a certain point in either direction, and means for holding the pin in any position within the limits of its allowed motion, said latter means inserted between the link and the pin and bearing against the body of the pin so as to frictionally retard motion of the pin.

30. A feed actuating chain for veneer jointers and like machines, comprising a plurality of links, each link being substantially U-shaped transversely, plates joining each link and pivotally connected thereto, a plurality of slidable push pins also carried by each link, said push pins being longer than the width of the links whereby they may project from either side of the chain, and a spring interposed between the link and the pins carried thereby and frictionally engaging the pins to hold the same in any adjusted position.

31. In a machine employing a variable feed, a feed actuating chain, a race for said chain, means for driving the chain in one direction, said race having a break therein, a flaring end provided in the race on one side of said break, a removable wedge secured to the race in the flaring end, the links of said chain carrying push pins, said wedge encountering the displaced push pins during driving of the chain and forcing the pins to project from the opposite side of the chain.

32. A feed actuating mechanism including a traveling feed actuating chain, adjustable means carried by the chain, means for driving the chain, and means for cutting off power from the chain when engaged by said adjustable means, including a lever, a projection on said lever, said projection being normally in the path of said adjustable means when displaced whereby said lever is depressed upon engagement of the adjustable means with the tooth, and means for restoring the lever to its original position whereby the chain may start again.

33. A feed actuating mechanism including a feed actuating chain, adjustable means carried by the chain, means for driving the chain, and means for cutting off power from the chain when engaged by said adjustable means, including a lever, a tooth on said lever, said tooth being normally in the path of said adjustable means when displaced whereby said lever is depressed upon engagement of the adjustable means with the tooth, and means for restoring the lever to its original position, said last named means comprising a rod pivotally connected to the lever, a fixed guide for the rod whereby it may slide longitudinally, a spring mounted on said rod and bearing at one end against the guide, and means mounted on the rod for abutment against the other end of the spring.

34. A feed actuating mechanism including a feed actuating chain, adjustable means carried by the chain, means for driving the chain, and means for cutting off power from the chain when engaged by said adjustable means, including a lever, a tooth on said lever, said tooth being normally in the path of said adjustable means when displaced whereby said lever is depressed upon engagement of the adjustable means with the tooth, adjustable means with the tooth, means for restoring the lever to its original position, said last named means comprising a rod pivotally connected to the lever, a fixed guide for the rod whereby it may slide longitudinally, a spring mounted on said rod and bearing at one end against the guide, means mounted on the rod for abutment against the other end of the spring, a head provided at the extremity of the rod remote from its connection to the lever, and a hand lever pivotally mounted in position to engage with said head when pulled to effect depression of the pawl.

35. A feed actuating mechanism including a feed actuating chain, adjustable means carried by the chain, means for driving the chain, and means for cutting off power from the chain when engaged by said adjustable means, including a pivotally mounted pawl, a projection or tooth provided on said pawl and engageable by any one of said adjustable elements to effect depression of the

pawl, an arm provided on that end of the pawl remote from its pivot, a bell crank lever having an arm engageable with the arm of the pawl, a trigger pin carried by the other arm of said bell crank lever, a multi-armed lever mounted adjacent the bell crank lever and carrying a cooperating trigger pin, means connecting the last named lever and the power cut-off means, and means for restoring the mechanism to its original position after cutting off the power has been effected.

36. A feed actuating mechanism including a feed actuating chain, adjustable means carried by the chain, means for driving the chain, and means for cutting off power from the chain when engaged by said adjustable means, including a pawl depressible by said adjustable means, means for restoring the pawl to its original position after depression, a bell crank lever in the path of the pawl and swingable upon depression thereof, another lever normally engaged by said bell crank lever, means for automatically bringing the two levers into engagement, means connecting the last lever with the power cut-off mechanism, and power actuated means for swinging the last lever to again connect the chain with the source of power.

In testimony, that I claim the foregoing as my own I have hereto affixed my signature.

ORIN C. FENLASON.