No. 812,987. PATENTED FEB. 20, 1906.

M. GARLAND.

RESAWING ATTACHMENT FOR BAND SAWS.

APPLICATION FILED JAN. 28, 1904.

4 SHEETS—SHEET 1.

FIG. 1.

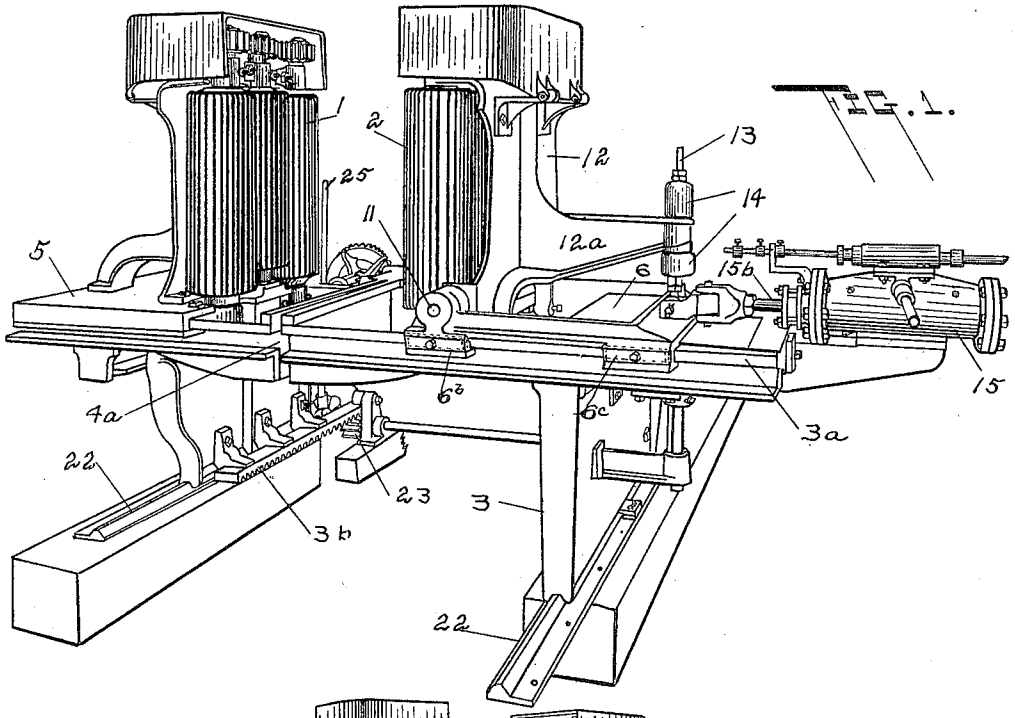
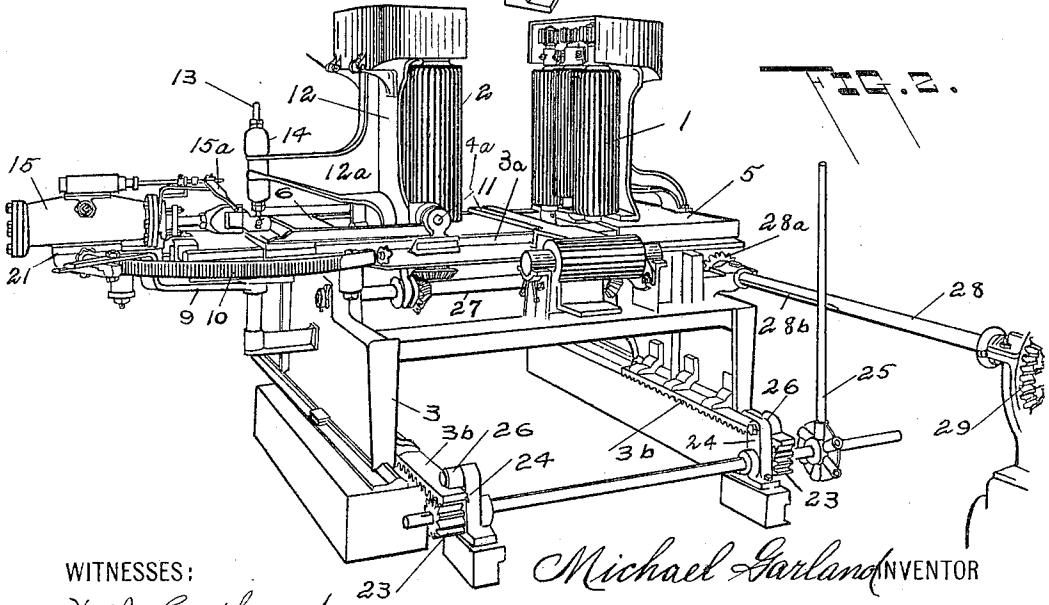


FIG. 2.



WITNESSES:

W. D. Cathcart.

A. A. Easterly.

Michael Garland INVENTOR

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4 SHEETS—SHEET 2.

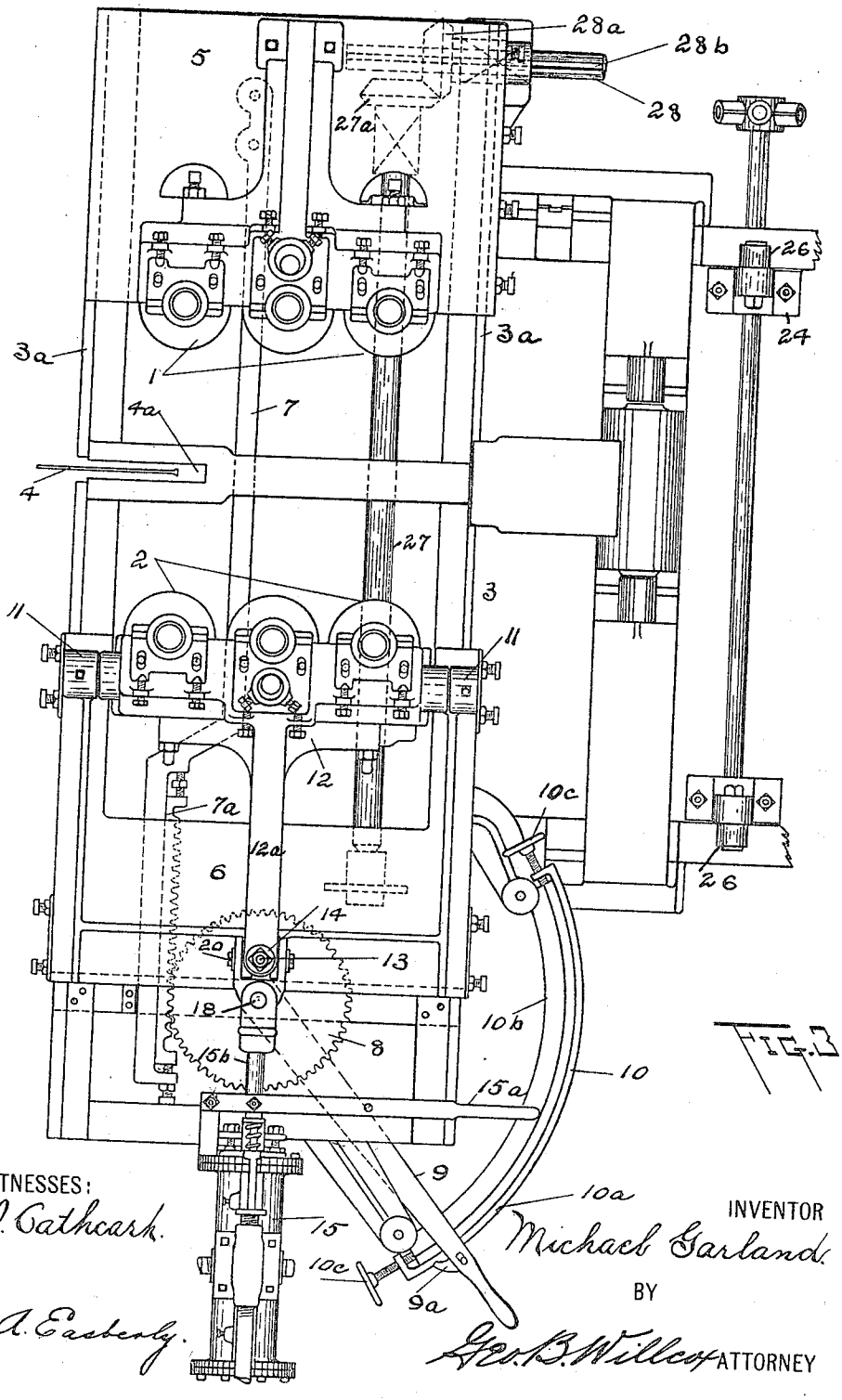


FIG. 3

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4 SHEETS—SHEET 3.

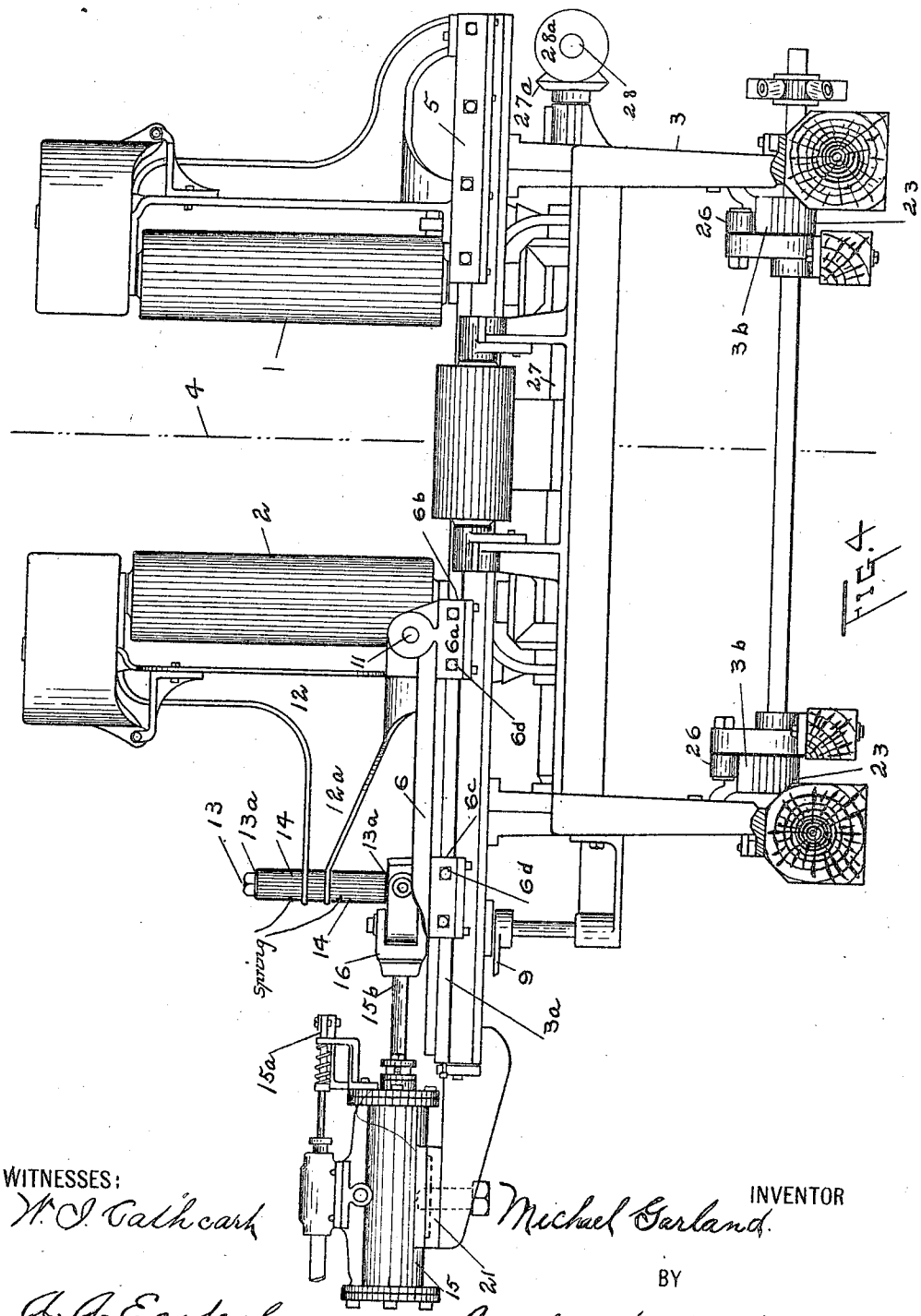


FIG. 4.

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4 SHEETS—SHEET 4.

FIG. 5

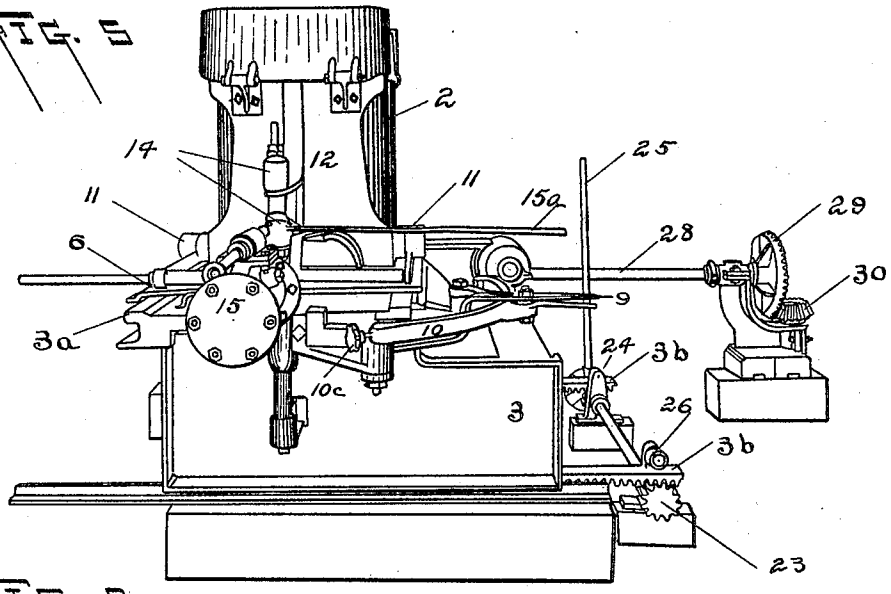


FIG. 6

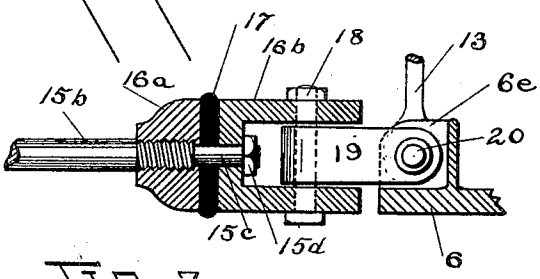


FIG. 8

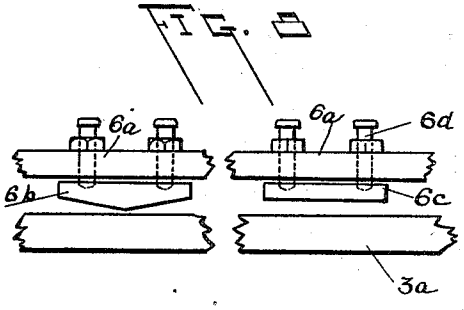
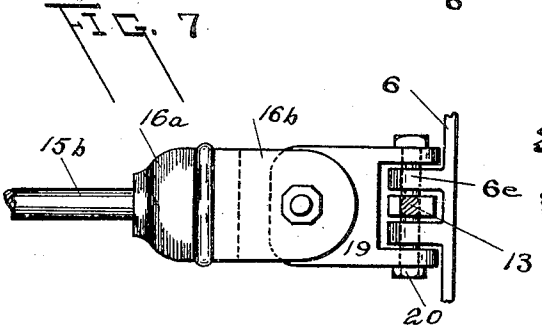
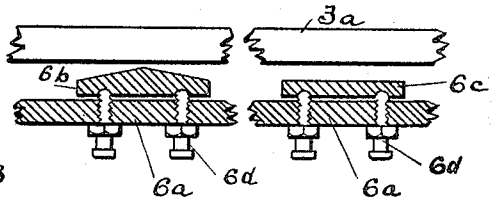


FIG. 7





WITNESSES:

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A. A. Easterly.

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UNITED STATES PATENT OFFICE.

MICHAEL GARLAND, OF BAY CITY, MICHIGAN, ASSIGNOR TO THE M. GARLAND COMPANY, OF BAY CITY, MICHIGAN.

RESAWING ATTACHMENT FOR BAND-SAWS.

No. 812,987. Specification of Letters Patent. Patented Feb. 20, 1906.

Application filed January 28, 1904. Serial No. 190,962.

To all whom it may concern:

Be it known that I, MICHAEL GARLAND, a citizen of the United States, residing at Bay City, in the county of Bay and State of Michigan, have invented certain new and useful Improvements in Resawing Attachments for Band-Saws; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention is a resaw-machine and is adapted to be used in connection with a common band-saw to convert it into a resaw when desired.

The objects of the invention are to provide a resawing attachment applicable to band-saws of ordinary form and capable of being quickly applied to and withdrawn from the band-saw when it is desired to change the saw or to remove the resawing device for any purpose.

A second object is to provide means for positively actuating the pressure-rollers back and forth by uniformly elastic pressure applied by steam or other fluid through the medium of a cylinder and piston controlled by the operator.

My invention further consists in certain devices, their combinations and equivalents, as will be more fully set forth in this specification.

The invention is illustrated in the accompanying drawings, in which—

Figure 1 is a perspective view of the machine as viewed from the band-saw. Fig. 2 is a perspective of the machine viewed from the feeding end and looking toward the band-saw. Fig. 3 is a top plan view. Fig. 4 is an elevation of the feeding end of the machine. Fig. 5 is a perspective of the working side of the machine, or the side on which the cylinder and operator are located. Fig. 6 is an enlarged vertical sectional detail through the cross-head that connects the piston-rod to the pressure-roller carriage. Fig. 7 is a top plan view of the same. Fig. 8 is a plan view showing in detail the gibs that guide the pressure-roller carriage in its back-and-forth movement on the frame.

As is clearly shown in the drawings, the machine consists in the usual sets of rollers comprising a row of gage-rollers 1 and a row of pressure-rollers 2, both sets of rollers being carried on a movable frame 3, that can be withdrawn from or advanced to the band-saw 4, as shown in Fig. 3.

The frame 3 is provided at its top with suitable horizontal guides 3^a, on which are slidably mounted the carriage 5, that carries the gage-rollers 1, and the carriage 6, that carries the pressure-rollers 2. Each of the carriages 5 and 6 is capable of movement along the guides 3^a to bring the rollers 1 and 2 toward or from the vertical plane of the saw-blade 4, which in its cutting position operates in a slot 4^a, provided in the frame of the machine. The gage-rollers 1, which determine the thickness of the resawed board, are set toward or from the saw by the following means: A bar 7 is fixed at one end to the carriage 5 and extends lengthwise beneath the carriage and carries at its front end a rack 7^a, which is engaged by a horizontal gear 8, as shown in Fig. 3. Fixed to the vertical shaft of the gear 8 is a lever-arm 9, by which the operator may turn the gear 8 to operate the rack 7^a and move the carriage 5. To set the carriage at any desired distance from the saw-line—as, for instance, two inches, when it is required to saw a two-inch board from the cant—a quadrant 10 is provided for the lever 9, and the latch 9^a on the lever engages notches 10^a on the quadrant. These notches are the proper distance apart to give the various desired thicknesses of boards. The quadrant 10 is mounted on a bracket 10^b and is provided with threaded lugs, through which pass set-screws 10^c, by which it may be adjusted lengthwise relatively to the bracket 10^b. This adjustment of the quadrant 10 is designed to compensate for any wear in the moving parts which would otherwise affect the thickness of the boards and enables the operator to produce resawed lumber of uniform thickness. Almost no two band-saws run alike, each having a tendency peculiar to itself to cut either too thick or too thin. During the work-day saws have to be changed frequently, and usually with each change it is necessary to shift the quadrant 10 by means of the screws 10^c to correct for the peculiarity of each saw.

As has been previously described, the pressure-rolls 2 are carried by the carriage 6, which is slidable toward and from the saw along the guides 3^a. These rolls are capable of three movements, any two or all of which

may take place simultaneously: first, the back-and-forth movement just referred to; second, a backwardly-tilting movement, and, third, a limited back-and-forth movement of the two outside rollers relatively to the middle roller, so that the vertical plane of the roller-faces instead of being parallel with the plane of the saw-blade, as shown in Fig. 3, may occupy a slightly-diagonal position thereto. The object of these movements is to permit the pressure-rollers 2 to exert the full effect of their pressure against the cant, while being free to yield to any unevenness of the surface of the cant. To make the above yielding movements possible, I employ the following construction in the carriage 6 and the devices that support the roller: The forward end of the carriage 6 is provided with a pair of trunnions 11, upon which is pivotally mounted a bracket 12, that carries the pressure-rollers. The bracket has a rearwardly-projecting arm 12^a, through which passes a vertical eyebolt 13, pivoted at its lower end to the carriage 6 and provided with washers 13^a. Between the washers and the bracket-arm 12^a are rubber cushions 14, one above and one below the bracket-arm, to keep the bracket 12 and the rollers 2 normally vertical, but to permit them to tilt slightly back and forth about the trunnions 11 to accommodate unevennesses in the surface of the cant.

The limited diagonal movement of the rollers 2 relatively to the saw 4 above referred to is permitted by the construction shown in Fig. 8. Upon the horizontal guides 3^a the carriage 6 is slidably mounted, being held in place by downwardly-extending wings 6^a, and between the wings 6^a and the guides 3^a are placed tapered gibs 6^b at the forward end of the carriage and flat gibs 6^c at the rear end, the gibs being held in place by suitable set-bolts 6^d. The flat gibs are narrower and consequently have more lateral play than the tapered gibs, permitting a limited transverse movement to the rear end of the carriage, so the rollers 2 may take a slightly-diagonal position relatively to the plane of the saw-blade 4.

The back-and-forth movement of the carriage and the yielding pressure against the cant are produced by means of an engine 15, comprising a cylinder and piston and operating-valves of any suitable type, the engine being operated by steam or other fluid under pressure, the supply being regulated by means of a lever 15^a, controlled by the operator. Admitting fluid under pressure to the rear end of the cylinder 15 pushes the piston-rod 15^b forward and moves the rollers 2 toward the saw-line. Admitting fluid under pressure to the forward end of the cylinder draws the rollers 2 back.

A cross-head 16 connects the piston-rod 15^b and the carriage 6. The particular construction of the cross-head illustrated in Figs. 6 and 7 accomplishes two results in addition to that of moving the carriage back and forth. One of these is to reduce the shock of the moving parts when the rollers 2 are suddenly jammed against the cant. This is accomplished by making the cross-head in two parts, the rear part 16^a being secured to the piston-rod 15^b and the forward part 16^b being slidably mounted on the reduced end 15^c of the piston-rod. A rubber cushion 17 is inserted between the parts 16^a and 16^b, and a set-nut 15^d is provided on the end 15^c to hold the parts in place. The other result is to permit slight lateral or diagonal play of the rollers, as previously described, without springing the piston-rod 15^b or injuring the packing of the engine. It will be remembered that the diagonal movement of the rollers 2 produces a corresponding lateral or sidewise movement of the rear end of the carriage 6, and consequently of the cross-head 16. I therefore provide a joint in the cross-head to accommodate this lateral movement, the joint being shown in detail in Figs. 6 and 7, where 18 is a bolt carried by the part 16^b and 19 is a yoke pivoted thereon, the forward end of the yoke being fastened to the carriage 6 by means of the pin 20 passing through suitable lugs 6^c on the carriage. The lower end of the eyebolt 13 is also engaged by the pin 20.

To prevent springing the piston-rod by the lateral movement of the carriage 6, I mount the cylinder 15 upon a suitable pivot 21, carried by the frame of the machine. The cylinder is thus capable of swinging horizontally about its center to follow the lateral movement of the carriage 6.

It has been mentioned that the frame 3 is movably mounted relatively to the fixed saw 4 and may be brought up to the saw or drawn back therefrom. For that purpose the frame 3 is slidably mounted on suitable tracks 22, arranged parallel with the plane of the saw. A suitable rack 3^b is provided on the frame 3 parallel with said tracks, there being preferably a rack on each side of the frame. Engaging each rack is a pinion 23, mounted in suitable brackets 24 and operated by means of a shaft and pinch-bar 25. To prevent disengagement of the racks and pinions, rollers 26 are mounted on the brackets above the racks, as shown in Fig. 2.

The sets of rollers 1 and 2 are driven by suitable gears from a shaft 27, mounted on the frame 3 and having a beveled pinion 27^a at its end. A second pinion 28^a, mounted on the fixed shaft 28, drives the pinion 27^a. In the bore of the pinion 28^a is a key or feather engaging a long slot or keyway 28^b in the shaft 28. As the machine is moved back the pinion 28^a slides along the fixed shaft 28.

This latter shaft derives its power from any suitable means—as, for instance, the bevel-gear 29 and suitably-driven bevel-pinion 30.

The operation of the machine is as follows: The operator first sets the gage-rolls 1 back about the thickness of the cant to be resawed and then admits fluid under pressure to the rear end of the cylinder 15 to force the pressure-rollers and hold them yieldingly against the cant. The pressure of the two sets of moving rollers against the cant causes them to grip the cant and feed it forward to the saw 4, which cuts a board from the cant if the cant has been squared and cuts a slab from the cant if it has not been squared. During the cut the pressure-rollers yield back against the elastic pressure of the engine or tilt back against the resilience of the rubber cushions 14 or yield sidewise to conform to any unevennesses in the surface of the cant. Any one of these movements can occur alone or they may occur simultaneously, depending upon the nature of the surface of the cant. After passing the saw 4 the cant is carried back by any suitable means and put in position to be passed again through the resaw. The operator admits fluid under pressure to the front end of cylinder 15 and draws the pressure-rolls 2 back to their normal position. He then sets in the guide-rollers 2 by means of the hand-lever 9, the exact distance being regulated by the notches 10^a on the quadrant 10, which are spaced apart to correspond to the standard thicknesses of boards. Next he applies the pressure-rollers, and the cant goes through as before. It is found in practice that the engine 15 provides an almost perfectly elastic cushion, which responds instantly to the slightest variation in the surface of the cant, there being no inertia to overcome, as is the case when heavy weights are used to control the pressure of the rollers. The rollers can be drawn back instantly by very slight movement of the hand-lever 15^a without exertion on the part of the operator. The amount of pressure exerted by the rollers can be adjusted with the greatest ease by suitably throttling the admission of exhaust-outlets of the cylinder, and the speed of the rollers back and forth can be controlled by the same means.

This machine or "feedworks," as it is often termed, can be used in front of any band-mill, and by being movable relatively to the band-saw the time required for taking out the saw and replacing it with a sharp one is reduced to the minimum, as the feedworks when moved back offers no obstruction.

What I claim as my invention, and desire to secure by Letters Patent, is as follows:

1. In a resawing-machine having a feed-roll slide, capable of angular variations, the combination with the piston-rod pivotally connected to said slide; of a pivotally-mounted cylinder, and a piston therein, fixed to said rod, for the purposes set forth.

2. In combination with the sliding carriage and pressure-roll of a resaw-machine, a bracket mounted on said carriage and pivotally connected thereto near the bottom of said roll; a rearwardly-extending arm on said bracket; fixed cushions above and below said arm and adapted to limit its vertical movement; a cylinder having a fluid-actuated reciprocating piston, and means connecting said piston with said sliding carriage.

3. In combination with the movable pressure-roll carriage of a band-saw machine, a longitudinally-immovable cylinder having a fluid-actuated reciprocating piston, a piston-rod connecting said piston with said carriage; a two-part cross-head on said rod, the rear part of said cross-head being fixed to the rod and the forward part of said cross-head being slidably mounted on said rod; together with a cushion inserted between the parts of said cross-head, for the purposes set forth.

4. In a resaw-machine, the combination with the roll-carrying carriage capable of limited lateral movement at its rear end; of a pivotally-mounted cylinder having a fluid-actuated reciprocating piston; and a piston-rod fixed at one end to said piston and pivotally connected at its other end to the rear end of said carriage.

5. In a resaw-machine having a movable carriage and gage-rollers mounted thereon; a bar fixed at one end to said carriage and having a rack near its other end; a gear-wheel engaging said rack and adapted to actuate it back and forth; a lever adapted to rotate said gear-wheel; a quadrant; means for engaging the lever at different distances along the quadrant; and means for adjusting the quadrant lengthwise, for the purposes set forth.

6. In a resaw-machine, the combination of a frame carrying adjustable pressure-rolls and a fluid-actuated engine for moving said rolls back and forth, and gage-rolls and means for operating them back and forth; together with tracks carrying said frame; racks on said frame, pinions engaging said racks and adapted to move said frame back and forth along the tracks, for the purpose set forth.

7. In a resaw-machine the combination with tracks of a frame movably mounted thereon, means for moving said frame, a carriage movable on said frame, a bracket pivoted to said carriage, pressure-rollers carried by said bracket, an arm on said bracket and cushions engaging said arm, a fluid-operated engine carried by the frame and connected to the carriage to actuate it back and forth; a second carriage movable on said frame; a bracket fixed to said carriage; gage-rollers carried by said bracket, a bar fixed to said carriage and having a rack; a gear mounted

in said frame and engaging said rack, a lever for actuating said gear, a quadrant to engage said lever, means for securing said quadrant to said lever, and means for adjusting said quadrant lengthwise; all arranged substantially as and for the purposes set forth.

8. In a sawing mechanism, the combination with suitable ways, of a carriage loosely mounted thereon, rolls secured to the carriage and adapted to engage the work, the rolls being spaced apart from each other, and means interposed between the carriage and the ways to provide points of contact with the ways which guide the line of travel of the carriage while permitting it to slew on the ways to cause the equal engagement of the rolls with the work.

9. In a resawing-machine, the combination with a suitable frame and a saw, of a carriage, rolls supported by the carriage and engaging the material to be sawed, and gibs secured to the carriage and comprising rocker members adapted to engage the frame to permit a lateral movement of the carriage for the purpose of causing the rollers to squarely engage and accommodate themselves to the surface of the material.

In testimony whereof I affix my signature in presence of two witnesses.

MICHAEL GARLAND.

Witnesses:
J. S. See,
A. A. Easterly.