(No Model.)

3 Sheets—Sheet 1.

W. J. FROST.

LATHE FOR POINTING MINERS' SPRAGS.

No. 562,128. Patented June 16, 1896.

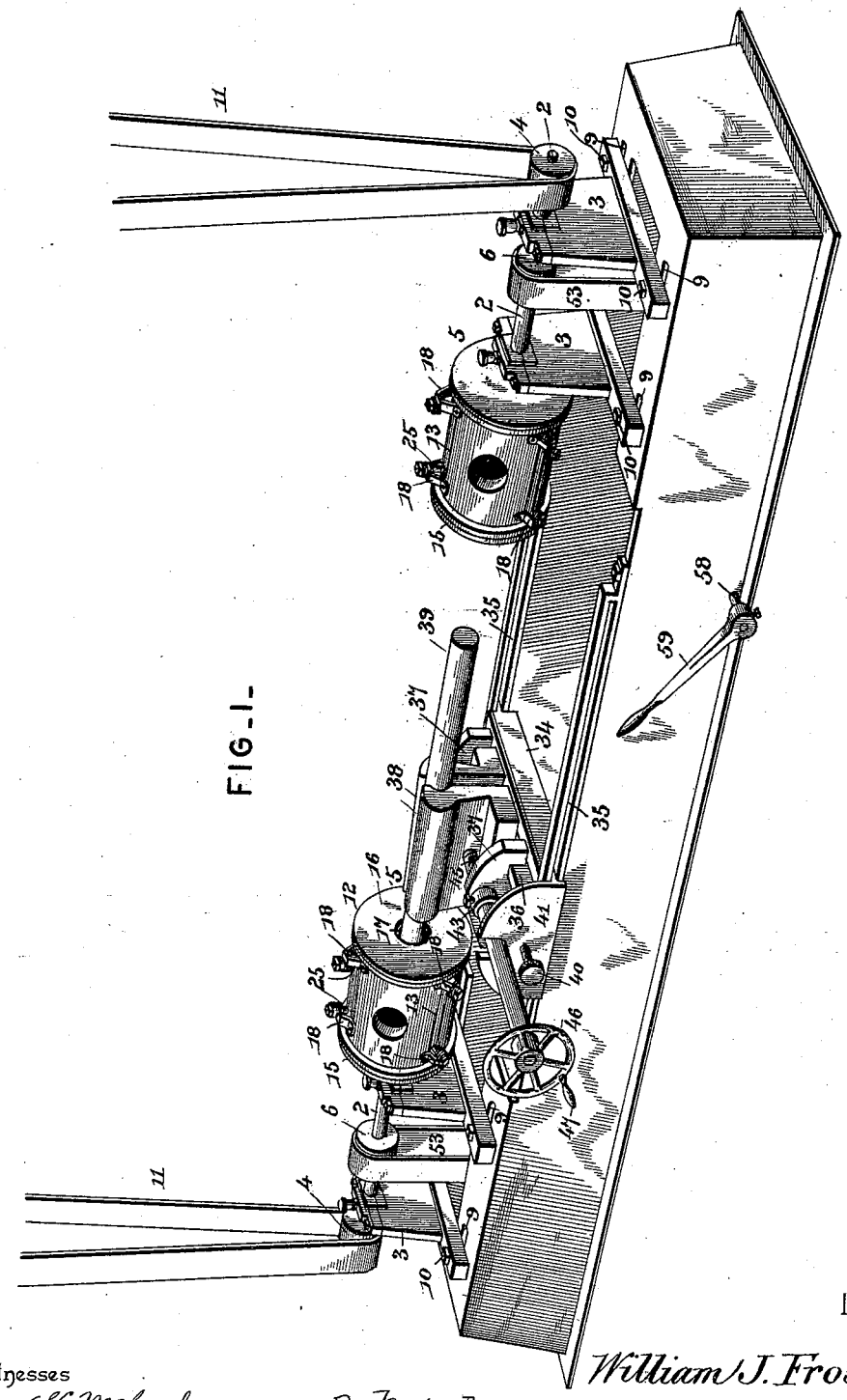

FIG. 1.

Inventor

William J. Frost

Witnesses

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(No Model.) 3 Sheets—Sheet 2.

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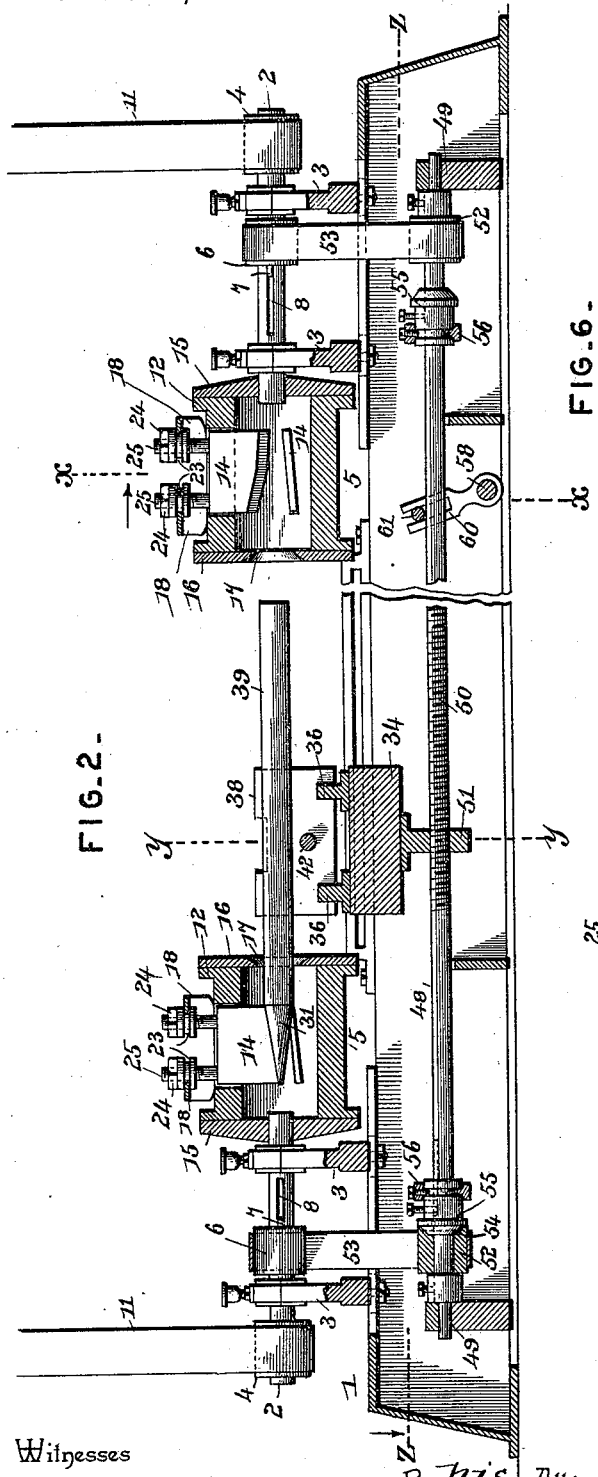

FIG. 2.

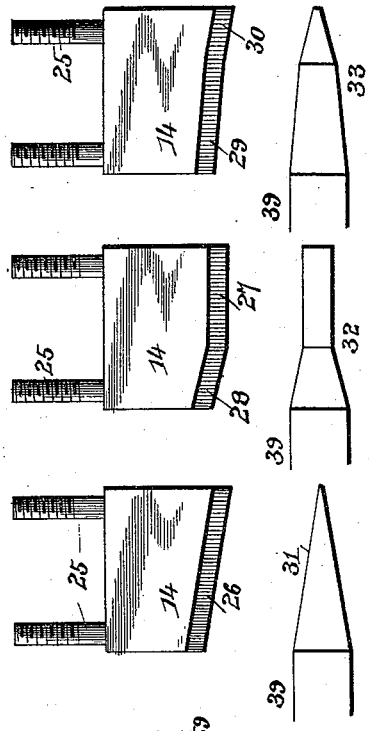

FIG. 6.

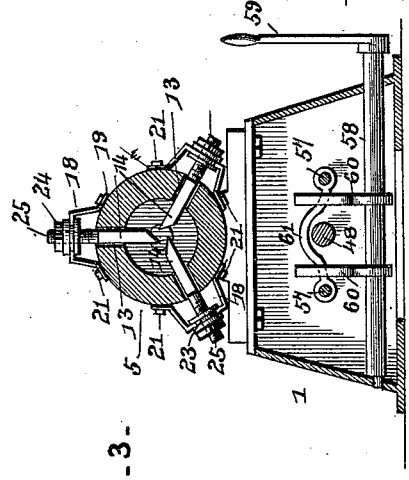

FIG. 3.

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(No Model.) 3 Sheets—Sheet 3.

W. J. FROST.

LATHE FOR POINTING MINERS' SPRAGS.

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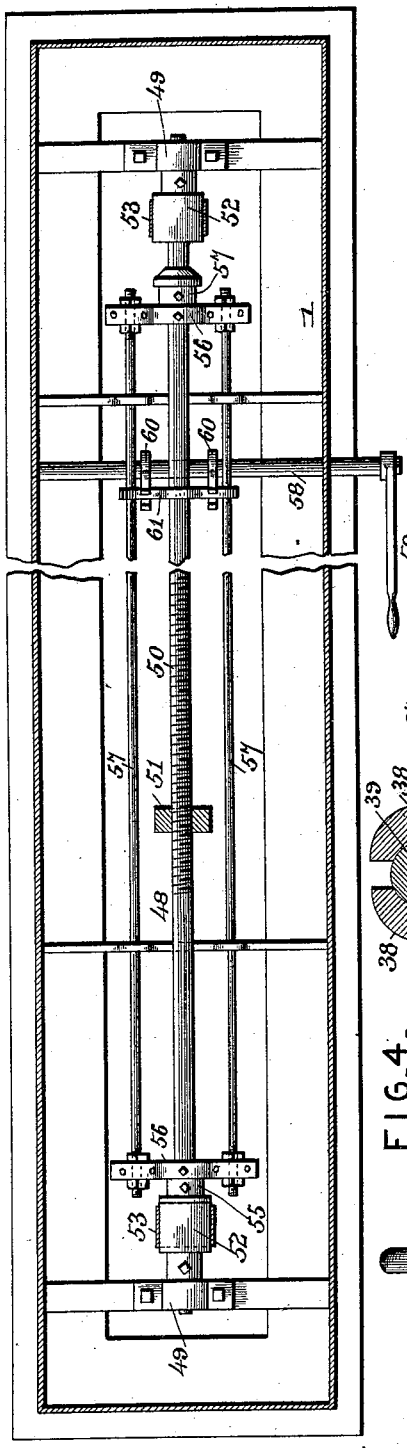

FIG-5.

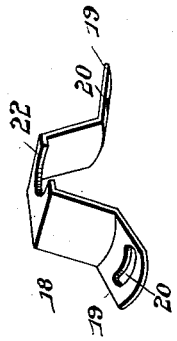

FIG-7.

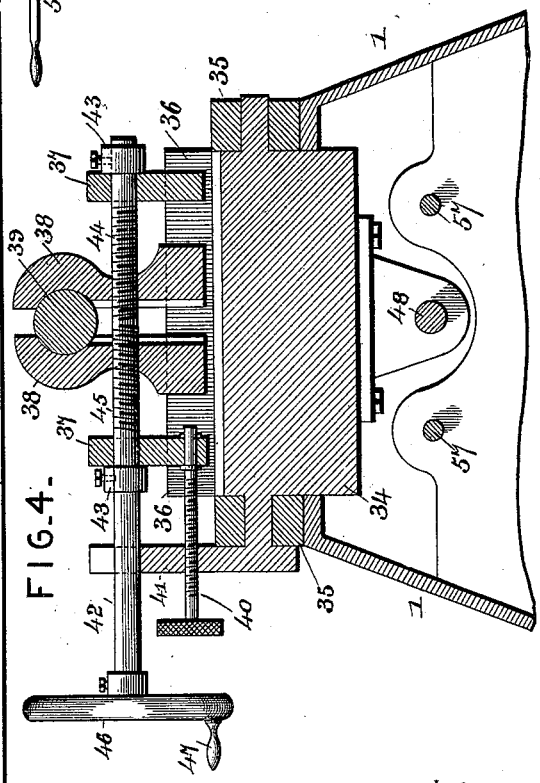

FIG-4.

Witnesses
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Inventor
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By his Attorneys.
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UNITED STATES PATENT OFFICE.

WILLIAM J. FROST, OF MOOSIC, PENNSYLVANIA.

LATHE FOR POINTING MINERS' SPRAGS.

SPECIFICATION forming part of Letters Patent No. 562,128, dated June 16, 1896.

Application filed April 11, 1895. Serial No. 545,312. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM J. FROST, a citizen of the United States, residing at Moosic, in the county of Lackawanna and State of Pennsylvania, have invented a new and useful Lathe for Pointing Miners' Sprags, of which the following is a specification.

This invention relates to woodworking machinery, and aims to provide a machine especially designed for pointing sprags used by miners for chocking mining-cars, and which can be used for pointing sticks and posts for any required purpose.

Heretofore, so far as I am aware, miners' sprags have been pointed by hand, which is a slow and tedious process. By the present invention these sprags can be quickly and cheaply manufactured, so as to place them within reach of the miners and at a nominal cost.

The improvement consists of two oppositely-disposed cutter-heads placed in axial alinement, a carriage provided with a work-holder, and mechanism for causing the carriage to travel back and forth between the said cutter-heads to present the work or sprags alternately to each cutter-head in the process of pointing the same.

The improvement further consists in the novel formation of the cutter-heads whereby the cutters can be adjusted to vary the taper and pitch of the sprag-point, and which will admit of the cutters being readily removed for sharpening or any other required purpose.

The improvement also further consists of the novel features and the peculiar construction and combination of the parts which hereinafter will be more fully described and claimed, and which are shown in the accompanying drawings, in which—

Figure 1 is a perspective view of a machine embodying the essence of the invention. Fig. 2 is a central longitudinal section of the same. Fig. 3 is a cross-section on the line X X of Fig. 2, looking to the right, as indicated by the arrow. Fig. 4 is a cross-section on the line Y Y of Fig. 2. Fig. 5 is a plan section on the line Z Z of Fig. 2. Fig. 6 shows different forms of cutters and the point of a sprag formed by each respective cutter. Fig. 7 is a detail view of a movable or rocking standard for the cutters.

Similar reference-numerals indicate corresponding parts in the different views.

The numeral 1 designates the bed of the machine, which is preferably cast, and which is designed to be mounted upon a suitable base or framework usually provided for lathes and woodworking machinery generally. Each end of the bed will be equipped with cutter-heads and the necessary adjuncts of like construction. Hence a detailed description of one will answer for the two.

A shaft 2 is mounted in pillow-blocks 3, and is provided on one end with a band-pulley 4 and on the opposite end with a cutter-head 5, and with a band-pulley 6 between the pillow-blocks. This band-pulley 6 is adjustable on the shaft 2, and is held to the latter by a key 7, operating in a groove 8, formed in the side of the shaft 2. The pillow-blocks 3 are adjustable on the bed 1 to adapt their relative position to the length of the sprag or blank to be pointed, the bed having longitudinal slots 9, through which extend bolts 10, by means of which the pillow-blocks are held in the adjusted position. The cutter-heads will be driven from a counter-shaft in the usual manner by means of belts 11, which pass around the band-pulleys 4.

The cutter-head 5 comprises a cylindrical portion 12, which is flanged at its ends and provided in its sides with slots or longitudinal openings 13, through which operate the cutters 14. This cylindrical body 12 is bolted, or otherwise secured, at one end to a head 15, which is fastened upon the shaft 2 in any desired manner. A plate 16 is attached to the opposite end of the cylindrical body and is centrally apertured, as shown at 17, the sides of the opening flaring outwardly to engage with the end of the sprag or blank and guide the same properly into the cutter-head. A standard or support 18 is located at each end of the slots 13, and is approximately of an inverted-U shape, the end portions 19 being bent outward and provided with transverse slots 20 to receive the fastening-bolts 21, by means of which the standards are held in the located position. The closed end of the standards has a semicircular notch 22 to fit into an annular groove 23, formed in the side of the adjusting-nut 24.

It will be understood that an adjusting-nut

24 will be provided for each standard and one for each threaded stem 25 of the cutters 14. The bent ends 19 of the standards are curved so as to tilt or rock upon the cutter-heads to admit of the standards adapting themselves to the relative position of the cutters when adjusting the same to secure the required length or pitch of point to be given the sprags or blanks to be pointed.

The cutters 14 are adapted to obtain a snug fit in the slots 13, but are slightly shorter than the length of the slots to admit of a rocking adjustment, whereby the required length of point may be given to the sprag or article to be pointed. Each cutter has a threaded stem 25 near each end and projecting outward from its rear edge, and which is adapted to receive an adjusting-nut 24, by means of which the cutter is properly positioned.

The cutting edges may be straight and incline, as shown at 26 in Fig. 6, or they may have a straight portion 27 and an inclined portion 28, as indicated in said figure, or they may have a slightly-inclined portion 29 and a short and steeper-inclined portion 30, as shown to the right in Fig. 6. The point 31, produced by the cutting edge 26, tapers uniformly throughout its length. The end 32, produced by the cutting edges 27 and 28, has its outer portion cylindrical and a conical-shaped part at the inner end of the cylindrical part. This form is best adapted to provide a handle to the sprags. The point 33 has a long tapering portion and a more rapidly-tapering end and is formed by the cutting edges 29 and 30. Obviously the cutters may have variously-shaped edges, so as to produce the required style of point.

The carriage 34, which is adapted to travel upon the bed 1, has its end portions operating in slotted ways 35, provided at the sides of the bed 1. Tracks 36 are disposed in parallel relation and extend transversely across the top side of the carriage 34 and form a support for the work-holder, which comprises vertical pieces 37 and jaws 38, the vertical pieces 37 and the jaws 38 being adapted to move upon the tracks 36 to bring the work or sprag 39 to be pointed opposite the center of the cutter-heads. A set-screw 40 passes through a threaded opening in a vertical extension 41 of the carriage 34, and has its inner end connected with one of the pieces 37 in such a manner that when a longitudinal movement is imparted to the set-screw 40 the work-holder will be moved across the carriage and properly position the work. A shaft 42 is journaled in the vertical extension 41 and the vertical pieces 37, and is held from longitudinal movement in its bearings in any desired manner, preferably by collars 43, which are secured upon the shaft 42 exterior to the vertical pieces 37. This shaft has a right screw-thread 44 and a left screw-thread 45, which engage with threaded openings in the respective jaws 38, whereby the latter are separated and brought together as required to release or clamp the work, as will be readily understood. This shaft 42 is capable of being rotated in its bearings and is turned by suitable provisions, a hand-wheel 46, having a handle 47, being provided for the purpose.

A long feed-screw 48 is journaled at its ends in suitable bearings 49, provided on the bed 1, and its threaded portion 50 is adapted to engage with a threaded lug 51, pendent from the carriage 34. Obviously on rotating the feed-screw 48 in one or the other direction, the carriage 34 will be moved upon the bed 1 and advance the sprag or work to the required cutter-head. A pulley 52 is loosely mounted upon each end of the feed-screw 48, so as to rotate freely thereon, and is driven from the corresponding band-pulley 6 by means of a belt 53. The inner face of the pulley 52 has a flaring depression 54 to be engaged by the conical-shaped end of a friction-clutch 55, mounted upon the feed-screw 48 so as to revolve therewith, but capable of having a movement thereon to and from the pulley 52. A cross-head 56 has attachment with each friction-clutch 55, and the cross-heads at opposite ends of the machine are connected by tie-rods 57, extending parallel with the feed-screw 48, one upon each side thereof. A shaft or rocker-bar 58 extends transversely of the bed 1 and has an operating-lever 59 at its outer end, and is provided between its ends with upwardly-extending arms 60, which are slotted in their upper extremities to receive a yoke 61, which connects the tie-rods 57. By operating the lever 59 the cross-heads 56 are moved in unison and simultaneously actuate the friction-clutches attached thereto. Hence one cutter-head is thrown out of gear at the same time that the opposite cutter-head is thrown in gear, and inasmuch as the cutter-heads are driven in reverse or opposite directions it will be seen that when one cutter-head is in gear with the feed-screw 48 the latter will be rotated in one direction and feed the work to the cutter-head driving or in gear with the feed-screw, and when the other cutter-head is geared with the feed-screw the latter will be rotated in an opposite direction, so as to move the carriage in a reverse direction and move the work in an opposite direction and toward the cutter-head now in gear with and operating the feed-screw.

When it is required to adjust the cutters to vary the taper or pitch of the points to be formed, the fastening-bolts 21 are loosened and the adjusting-nuts 24 are turned until the required set is given to the cutters. As the cutters are adjusting the standards 18 will adapt themselves to the position of the cutters, so as to obviate binding between the standards and the adjusting-nuts 24, as will be readily appreciated, and after the required adjustment is attained the standards are made fast by tightening the fastenings 21.

The sprag or work 39 to be pointed is clamped between the jaws 38 of the work-holder by operating the shaft 42 in the proper

direction. To centralize the work, the set-screw 40 is actuated. The parts being properly adjusted and the cutter-heads rotated at the desired rate of speed, the work is advanced to one or the other of the cutter-heads by operating the lever 59, as already stated. When the feed-screw is in gear with one cutter-head, the work is advanced in one direction, and when in gear with the opposite cutter-head the work is backed from the first cutter-head and moved in a reverse direction to the opposite cutter-head, as previously stated.

The machine herein specifically set forth may be provided for various kinds of work. Therefore it will be understood that changes in the form, proportion, and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of this invention.

Having thus described the invention, what is claimed as new is—

1. A machine for pointing miners' sprags and like articles comprising oppositely-revolving cutter-heads, a work-holder, a feed-screw for moving the work-holder between the cutter-heads, and a clutch mechanism for connecting the feed-screw with either of the cutter-heads, whereby the sprag, or work, is advanced in the desired direction and toward the required cutter-head, substantially as set forth.

2. A machine for pointing miners' sprags and similar articles, comprising oppositely-rotating cutter-heads substantially in alinement, a carriage provided with a work-holder, a feed-screw operatively connected with the carriage to move the latter from one to the other of the cutter-heads, pulleys loosely mounted upon the feed-screw and driven from the respective cutter-head shafts, and a clutch mechanism adapted to gear the feed-screw with either of the said loosely-revolving pulleys thereon, whereby the work is advanced in the required direction, substantially as set forth.

3. A machine for pointing miners' sprags and like articles, comprising oppositely-rotating cutter-heads, a carriage provided with a work-holder, a feed-screw, pulleys loosely mounted upon the feed-screw and driven from the respective cutter-head shafts, and having flaring depressions in their sides, friction-clutches having approximately conical-shaped ends to engage with the recessed sides of the said pulleys, and means for operating the said clutches, whereby the feed-screw can be geared with either cutter-head, substantially as and for the purpose set forth.

4. In a sprag-pointing machine, the combination of a cutter-head, a carriage having a movement to and from the cutter-head and provided with a vertical extension and transverse tracks, clamping-jaws and vertical pieces slidably mounted upon the said tracks and capable of independent relative adjustment, a shaft slidably mounted in the said vertical extension and journaled in the vertical pieces, and having a right and a left hand thread on the portion located between the vertical pieces and fitted into correspondingly-threaded openings in the respective clamping-jaws so as to separate and bring them together, and a set-screw threaded into an opening in the aforesaid vertical extension and having positive connection with the adjacent vertical piece, whereby the vertical pieces, clamping-jaws, and shaft can be moved upon the transverse tracks of the carriage, substantially as set forth for the purpose described.

5. The combination with a cylindrical body having a slot in its side, of a cutter fitted in the said slot and having threaded stems, movable standards, and adjusting-nuts mounted upon the threaded stems and adapted to engage with the movable standards, substantially as described for the purpose set forth.

6. The combination with a cylindrical body having a slot in its side, of a cutter fitted in the said slot and having threaded stems, standards attached to the cylindrical body and having curved bearing ends, and adjusting-nuts mounted upon the threaded stems and engaging with the said standards, substantially as described for the purpose set forth.

7. The combination with a cylindrical body having a slot in its side, of a cutter fitted in the said slot and having threaded stems, standards having their lower ends curved and provided with slots extending in the direction of the curvature of the said ends, fastenings for securing the standards to the cylindrical body in the located position, and adjusting-nuts mounted upon the threaded stems of the cutter and adapted to engage with the said standards, substantially as described for the purpose set forth.

8. The combination with a cylindrical body having a slot in its side, of a cutter fitted in the said slot and having threaded stems, approximately inverted-U-shaped standards having their lower ends bent outward and curving and provided with slots extending in the direction of the curvature of the said bent ends, fastenings passing through the said slots to secure the standards in the adjusted position upon the cylindrical body, and adjusting-nuts having annular grooves to engage with a correspondingly-notched portion of the standards, substantially as set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

WILLIAM J. FROST.

Witnesses:

JOHN H. SIGGERS,

G. C. SHOEMAKER.