

(No Model.)

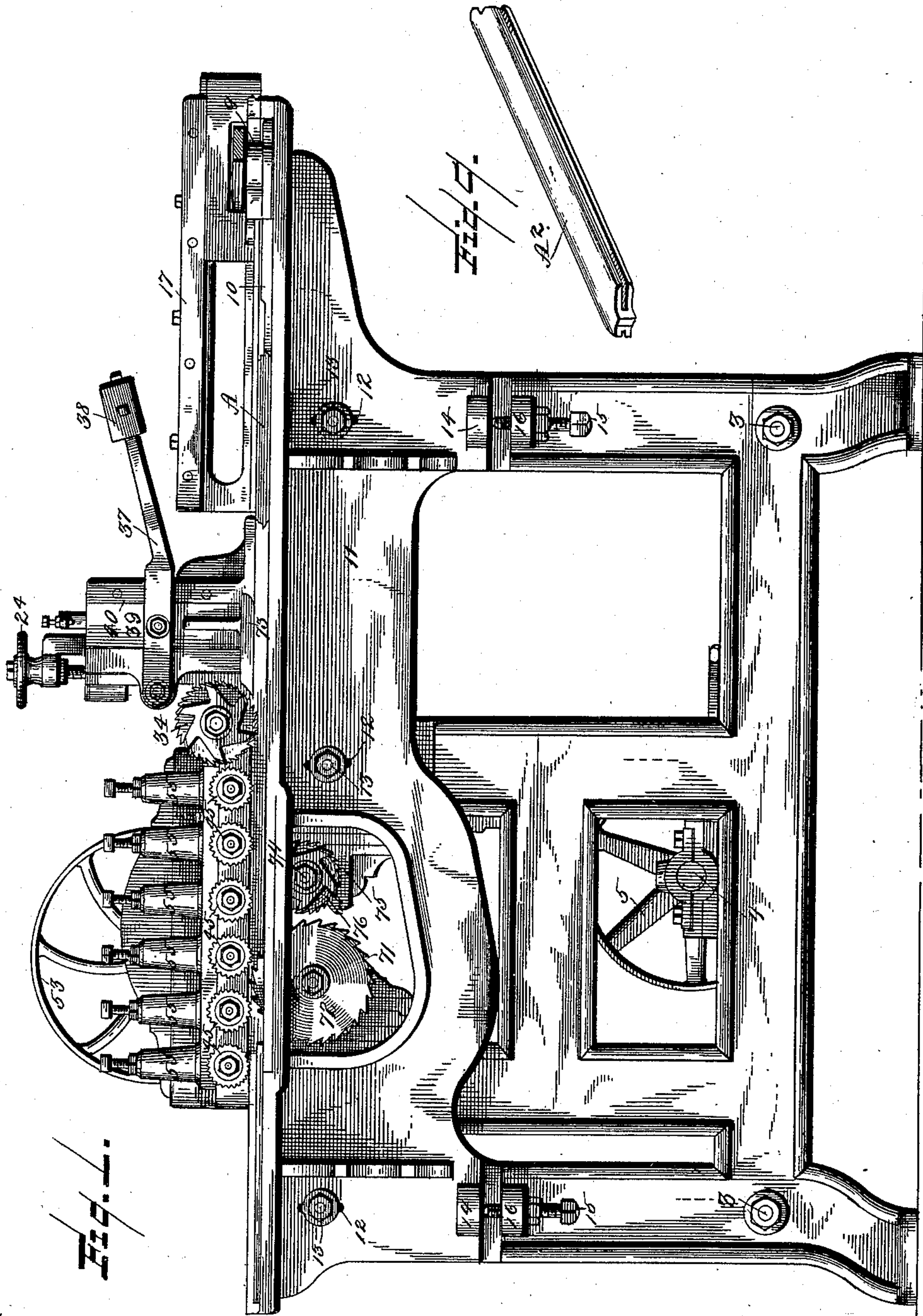
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G. L. KNAUSS.

MACHINE FOR MAKING SCHOOL SLATE FRAMES.

No. 383,955.

Patented June 5, 1888.



Witnesses:

*L. C. Hills.*  
*W. S. Duwall.*

Inventor:

*George L. Knauess*  
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(No Model.)

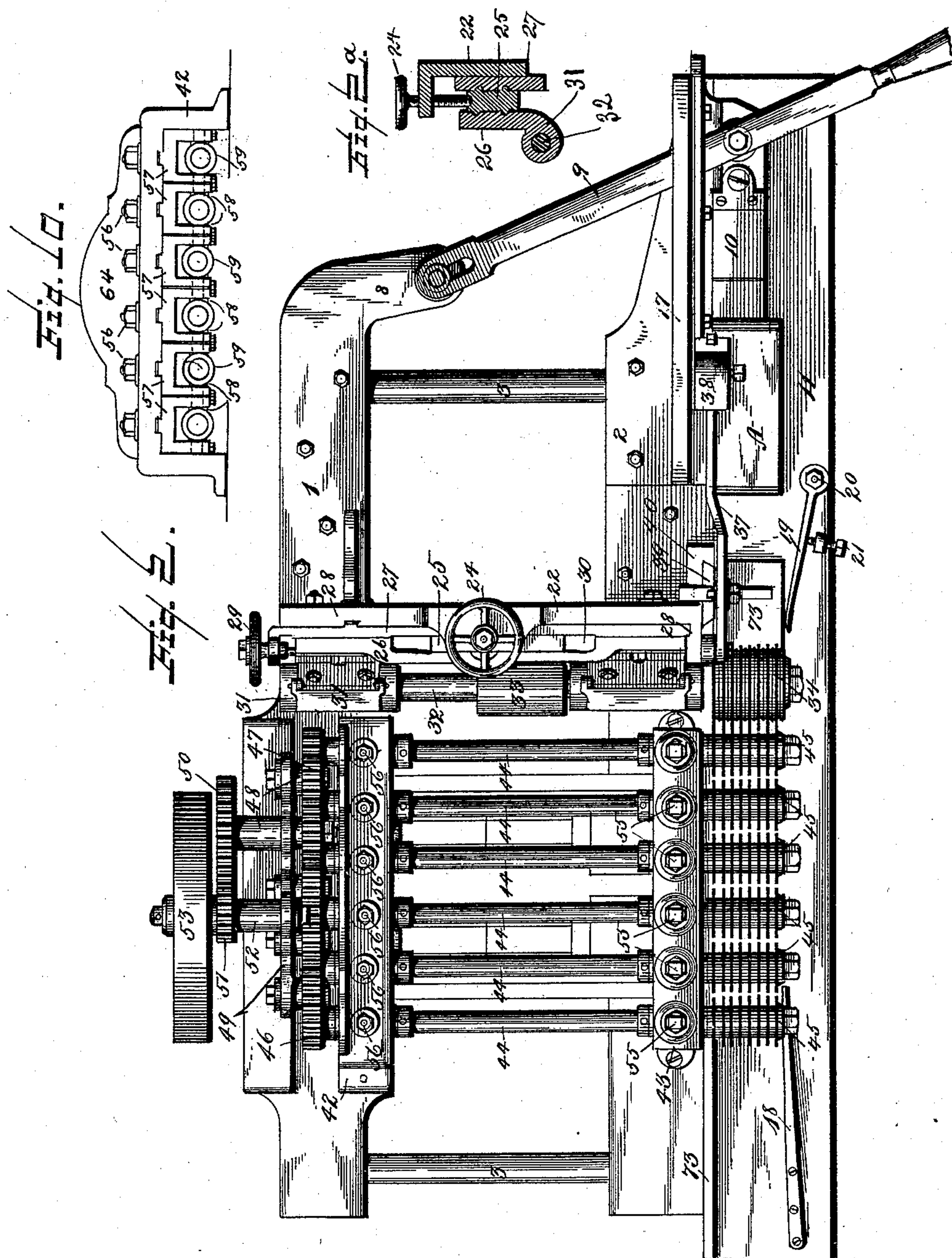
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Witnesses:

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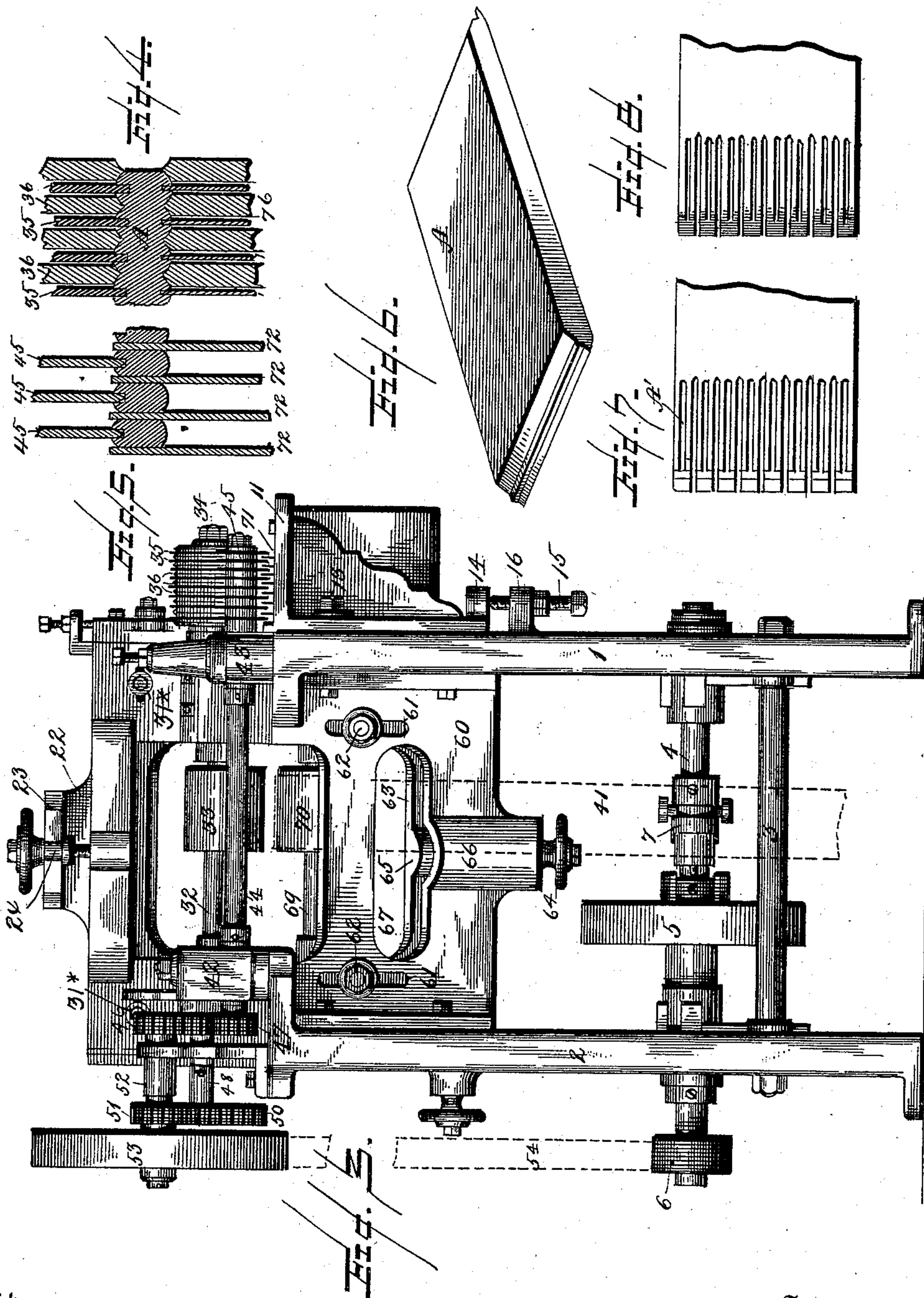
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*W. S. Duval*

Inventor:  
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# UNITED STATES PATENT OFFICE.

GEORGE L. KNAUSS, OF ALLENTOWN, PENNSYLVANIA, ASSIGNOR TO THE  
HYATT SCHOOL SLATE COMPANY, (LIMITED.)

## MACHINE FOR MAKING SCHOOL-SLATE FRAMES.

SPECIFICATION forming part of Letters Patent No. 383,955, dated June 5, 1888.

Application filed January 9, 1888. Serial No. 260,156. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE L. KNAUSS, a citizen of the United States, residing at Allentown, in the county of Lehigh, State of Pennsylvania, have invented certain new and useful Improvements in Machines for Making School-Slate Frames, of which the following is a specification, reference being had therein to the accompanying drawings.

The object of this invention is to provide a machine for forming the sticks of slate-frames; and the invention consists in certain features of construction, hereinafter described, and particularly pointed out in the claims.

Referring to the drawings, Figure 1 is a side elevation of a machine constructed in accordance with my invention. Fig. 2 is a plan of the same; Fig. 2<sup>a</sup> is a detail in section, hereinafter referred to; and Fig. 3, a rear elevation. Fig. 4 is a transverse section of a previously-prepared block undergoing the first step of its preparation. Fig. 5 is a similar view, the block undergoing the second step of its preparation. Fig. 6 is a perspective of the previously-prepared block before entering the machine. Figs. 7 and 8 are plans of the top and bottom, respectively, of the block shown in Fig. 6, the ends of said block having been partially fed to the machine and withdrawn for illustrative purpose. Fig. 9 is a perspective of one of the sticks formed from the block shown in Fig. 6 after the latter has passed entirely through the machine, and Fig. 10 is a detail, hereinafter referred to.

Similar letters of reference indicate like parts in all the figures of the drawings.

1 and 2 represent the two side frames or standards of the machine, which are spaced apart and bound in relative position at their lower ends by means of tie-bars 3. Mounted in suitable bearings near the lower ends of the frame thus formed is journaled a shaft, 4, upon which, near its center, is loosely mounted a pulley, 5, and at its outer end and outside of the side frame 2 it is provided with a fast pulley, 6. The pulley 5 is loosely mounted upon the shaft 4, and the hub of the same is toothed and adapted to receive a clutch, 7, mounted upon the shaft 4. The side frame 2 is in this instance formed with an inwardly-

projecting arm, 8, to which is loosely pivoted, by means of a slot in its pivoted end, through which a bolt passes, a feed-lever, 9, which extends transversely across the machine, and is provided with a handle and pivoted to a feed-block, 10, which feed-block rests and is adapted to slide upon a feed-table, 11, extending throughout the length of the side frame 1, and slotted, as at 12, by which it is held in an adjusted position through the medium of bolts 13, which pass through said slots and through the side frame 1.

At the bottom of the feed-table 11 are formed outwardly-projecting lugs 14, against which bear adjusting-bolts 15, which are seated in corresponding lugs, 16, formed upon side frame 1. By this arrangement a coarse adjustment of the feed-table with relation to the cutting mechanism, hereinafter described, is obtained. The feed-table 11 may be adjusted vertically by means of the bolts 15, and said table may be held rigidly in position by means of the bolts 13. The side frame 1 is provided with a slotted guard, 17, through the slot of which the free end of the feeding-lever 9 operates and is held against vertical displacement. The feed-table is further provided with flat springs 18 and 19 at its rear and forward ends, respectively, the latter spring being pivoted and made adjustable by means of a bolt, 20. A set screw, 21, bears upon the spring 19 forward of its pivot to increase or decrease the tension of said spring.

Extending transversely across the frame is a bridge, 22, which is formed with an upper overlapping portion, 23, in which is journaled a vertical screw, 24, carrying a hand-wheel at its upper end and meshing in an internally bored and threaded block, 25, which block is provided with longitudinal ribs which ride in corresponding grooves formed upon the inner faces of two companion plates, 26 and 27. (See Fig. 2<sup>a</sup>.) The plate 27 is supported for vertical movement in the bridge 22 by means of grooves 28, formed in the inner face of said bridge, into which one end of the plate 27 and a corresponding rib, formed on said plate, take. The plate 27 is also provided with an angular arm formed at the opposite end to that seated in the groove 28, in which arm is journaled a



set-screw, 29, the end of which bears against the plate 26, which is offset to form the slot 30, in which the block 25 is mounted. The plate 26 is shorter than its companion 27, and is adjustably connected thereto by means of bolts 31\*, which pass through slots formed therein, this arrangement being for a purpose hereinafter described.

Projecting rearwardly from the face of the plate 26, and at opposite sides, are boxes 31, in which is journaled a shaft, 32, carrying an intermediate fast pulley, 33, and a cutter-head, 34, at its outer end, which is held in position over the feed-table 11. The cutter-head 34 comprises alternate arrangement of circular saws and groovers, (the purpose and object of which will be hereinafter explained,) said saws and groovers being numbered 35 and 36, respectively. (See Figs. 3 and 4.)

Pivoted to the end of the bridge 22 is an arm, 37, upon which is mounted a movable weight, 38. The arm 37 is also intermediately pivoted to a sliding bar, 39, dovetailed and operating vertically in a grooved standard, 40.

A belt, 41, (see dotted lines, Fig. 3,) passes over the pulley 33 and connects the same with any suitable counter-shaft, (not shown,) so that a rapid motion is given the cutter-head 34, the cutter-head and its shaft being vertically and transversely adjustable by means of the hand-wheel 24 and bolts 31\* and their controlled mechanism, before described.

At each side of the frame and mounted upon the side frames, 1 2, are yokes 42 and 43. Within these yokes are journaled transverse shafts 44, which shafts are parallel and preferably adjustable in said boxes, and are provided at those ends above the feed-table with a series of feeding-disks, 45, which are of a size designed to take into the kerfs made by the saws 35 of the cutter-head 34, and thus feed a block submitted to the operation of the cutter-head back to the rear of the machine. These disks correspond in number and location with the saws 35. At the opposite ends of the shafts 44 are mounted cog-wheels 46, which are connected to each other by a train of intermediate cogs, 47, mounted on stub-shafts 48, journaled in a standard, 49, secured to the side frame 2. One of the stub-shafts 48 is longer than the remainder of the series and carries at its opposite end a large gear, 50, which meshes with a small gear, 51, mounted upon a stub-shaft, 52, which carries at its outer end a fast pulley, 53, connected by a belt, 54, with the small pulley 6 at the outer end of the shaft 4. The shaft 52 is mounted for rotation in the standard 49. The yoke 43 is provided with a series of ordinary spring-boxes, 55, by which said shafts 44 are held yieldingly in position.

To permit of the vertical movement of the shafts 44 and their feeders 45, and yet maintain proper driving-connection between the gears 46 and 48, I provide the yoke 42, that supports the geared ends of the shafts 44, with swinging and pivotal, or what may be termed

"universal," journal-boxes 64. (See Fig. 10.)

This universal box consists of the yoke or bridge 42, depending from which are a series of independent swinging smaller yokes or hangers, 57, in the lower ends of the yokes, there being pivoted on trunnions 58 bearings 59.

Referring to Figs. 1 and 3, 60 represents a transverse plate, which is bolted securely to the side frames, 1 and 2, and serves as additional spacer and brace for said frame. The plate 60 is slotted vertically, as at 61, through which project and are adapted to slide adjusting-bolts 62, which project from the rear space of a movable plate, 63, which plate is adjustable upon the plate 60 by means of said bolts 62 and a hand-wheel, 64, for operating said plate. Two plates, 63 and 60, are respectively ribbed and grooved, as at 65 and 66, to correspond with each other and insure a directly vertical movement of plate 63. (See Fig. 3.)

The plates 60 and 63 are transversely slotted, as at 67, to permit of the passage therethrough and to the rear of the machine of the belt 41, which operates the cutter-shaft 32. These plates, as shown in said Fig. 3, are at the rear of the machine, or, at least, in the rear of the cutter 34. Projecting inwardly from the plate 63 are boxes 68, in which are mounted a shaft, 69, carrying a pulley, 70, and at its end a cutter-head, 71, which consists of a series of suitably-spaced circular saws.

By the construction just described it is evident that by means of a wheel, 64, the plate 63, carrying the shaft 69 and the cutter-head, may be raised and lowered to expose more or less of the cutter-head 71 above the feed-table 11. These saws 72 occur intermediate the saws 35 in the cutter-head 34 and directly opposite the central point of the groovers 36 of said cutter-head 34, so that a block previously prepared will be first acted upon by the saws and groovers 35 and 36 of the cutter-head 34, and afterward severed into sticks by means of the saws 72 of the cutter-head 71, as will be hereinafter described.

Referring to Fig. 6, which is a perspective of a block or blank previously prepared to form the joints of said frame and of the desired length, width, and thickness, A represents the blank, which is placed upon the feed-table 11 in front of the push-block 10. The lever 9 is now grasped and swung to the rear, and the block or blank A, as shown in Figs. 2 and 1, is forwardly fed until it takes under an arm or pressure-plate, 73, formed at a right angle to the vertically sliding plate. The spring 19 rests against the outer edge of the block A, and said block is held snugly against the flange 73 of the feed-table 11, and in this position fed to the first cutter-head, 34, which forms the grooves and kerfs in the top face of the block. (Shown in Fig. 4.) By the time that the block A has passed partially from under the cutter 34 the feeding-disks 45 take into the kerfs A', formed by the saws 35, and feed the block thus beveled or grooved and slotted back to the rear of the machine and in the path of the cut-



ter-head 71, the saws 72 of which divide said blocks into sticks or strips A<sup>2</sup>, Fig. 9, which sticks may be assembled to form the completed frame, the kerfs A' serving to receive the edges of the slate.

The machine as thus far described may be used for the purpose of forming slate-frames of ordinary construction; but in order to adapt the same for forming slate-frames of special construction I mount under the feed-table upon a shaft, 74, which is journaled in vertically-adjustable boxes 75, a cutter-head, 76, which is but a duplication of the cutter-head 34, the kerfs made by the saws of the head 76 are adapted to receive a binding-wire, whereby the assembled sections of the completed frame are securely bound together. (See Fig. 4.)

If desired to manufacture slate-frames having simply a molded edge, an ordinary grooving cutter-head may be substituted for the cutter-head 76, just described.

This machine is designed to cut and form eight sticks at a single operation; but it is evident that the cutter-heads may be increased or decreased, so as to correspondingly increase or decrease their cutting capacities.

The spring 18 serves to catch or take against the liberated front end of the blank A as it passes from beneath the last series of feeding-disks, 45, and also serves, if desired, to guide the sticks thus cut onto an endless belt or other receptacle provided.

Having described my invention and its operation, what I claim is—

1. In a machine of the class described, the combination of a vertically and laterally adjustable cutter-head consisting of alternately-arranged saws and groovers, and a series of feeding-disks mounted upon independently-adjustable shafts in rear of said cutter-head, and independent mechanism for rotating said shafts and head at different relative speeds, substantially as specified.

2. In a machine of the class described, feeding-disks the shafts of which are mounted in vertically-adjustable spring-boxes at one side and swinging boxes at the opposite side, substantially as specified.

3. In a machine of the class described, the combination, with a cutter-head comprising an alternate arrangement of saws and groovers, a series of feeding-disks mounted in rear of the same, and a second cutter-head mounted in rear of first, said cutter-head consisting of a series of saws registering with the groovers in the first-mentioned head, substantially as specified.

4. In a machine of the class described, the combination of a cutter-head consisting of an alternate arrangement of saws and groovers with a second cutter-head consisting of a like arrangement and registering with the first cutter-head and mounted below the same, and

with a third cutter-head comprising a series of saws registering with the groovers of each cutter-head, substantially as specified.

5. In a machine of the class described, the combination, with a cutter-head adapted to form kerfs and grooves, of a similar cutter-head mounted below the same, a series of feeding-disks mounted upon shafts, and a third cutter-head comprising a series of saws registering with the groovers, and mechanism for operating the heads and shafts, substantially as specified.

6. In a machine of the class described, the combination, with the side frame 2, having the oppositely-located lugs 16, provided with screws 15, of the feed-table 11, mounted at one side of the frame upon said screws and having vertical slots 12, and bolts 13, passing through the slots and frame, substantially as specified.

7. The combination of the side frames, 1 and 2, carrying the feed-table 11, with the pivoted lever 9, having the feed-block 10, and guard 17, in which said lever is mounted for movement, substantially as specified.

8. The combination, with the bridge 22, having the hand-wheel and shaft 24 and vertical grooves 28, of the longitudinally-grooved and vertically-ribbed plate 27, having the hand-wheel and shaft 29, mounted at one side thereof, the longitudinally-ribbed block 25, mounted at one side of the plate 27 and connected with the shaft of the hand-wheel, and the grooved plate 26, mounted at the side of the block 25, and having bearings 31, in which is mounted the shaft 32, substantially as specified.

9. The shafts 44, carrying disks 45, with the bridge 43, having spring-boxes 55 for said shafts, and the bridge 42, having adjustable boxes 56, consisting of the pivoted hangers 57, and the bearings 59, having trunnions 58, journaled in said hangers and forming a bearing for the opposite ends of the shaft 44, substantially as specified.

10. The combination of the frames 1 and 2, constructed as shown and provided with the shaft 4, carrying pulleys 5 and 6, with the shafts 44, carrying gears 47, the standard 49, carrying shafts 48 and gears 47 and 50, the shaft 52, carrying gear 51, and the pulley 53, all operating as set forth.

11. The combination of the frames 1 and 2 with the stationary plate 60, slotted, as at 61, and grooved, as at 66, and having the bolts 62 and the hand-wheel 64, with the movable plate 63, having ribs 65, provided with boxes, and having journaled therein the cutter-head 71, substantially as specified.

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

GEORGE L. KNAUSS.

Witnesses:

JACOB D. BURGER,

EDWARD H. RENINGER.