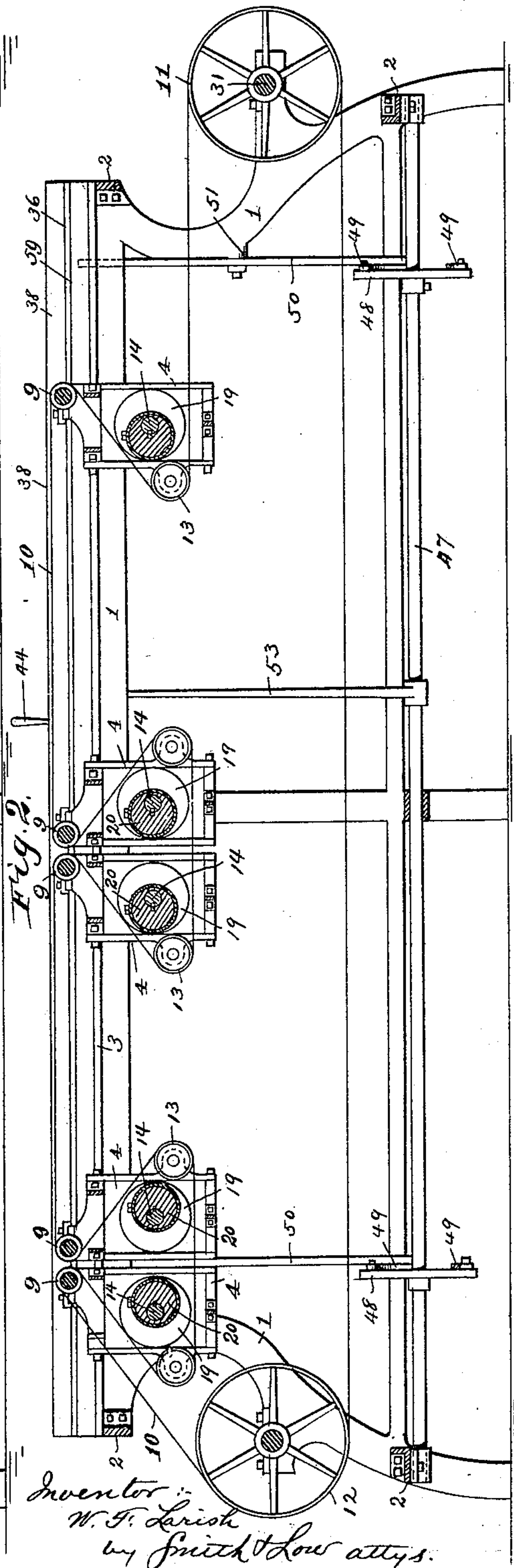


3 Sheets—Sheet 1.

No. 481,039.

Patented Aug. 16, 1892.



THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

(No Model.)

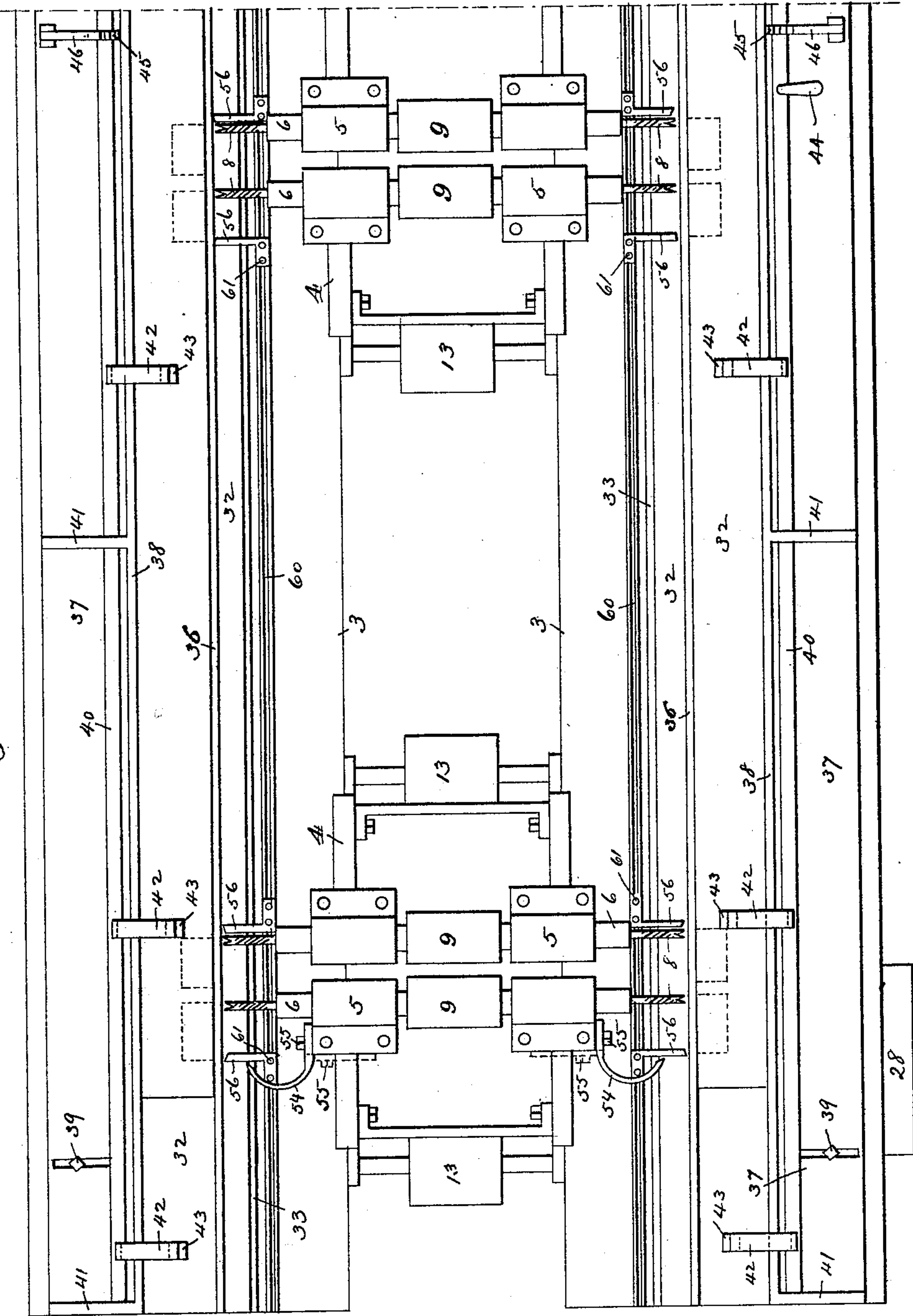
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W. F. LARISH.
MORTISING MACHINE.

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Fig. 3.



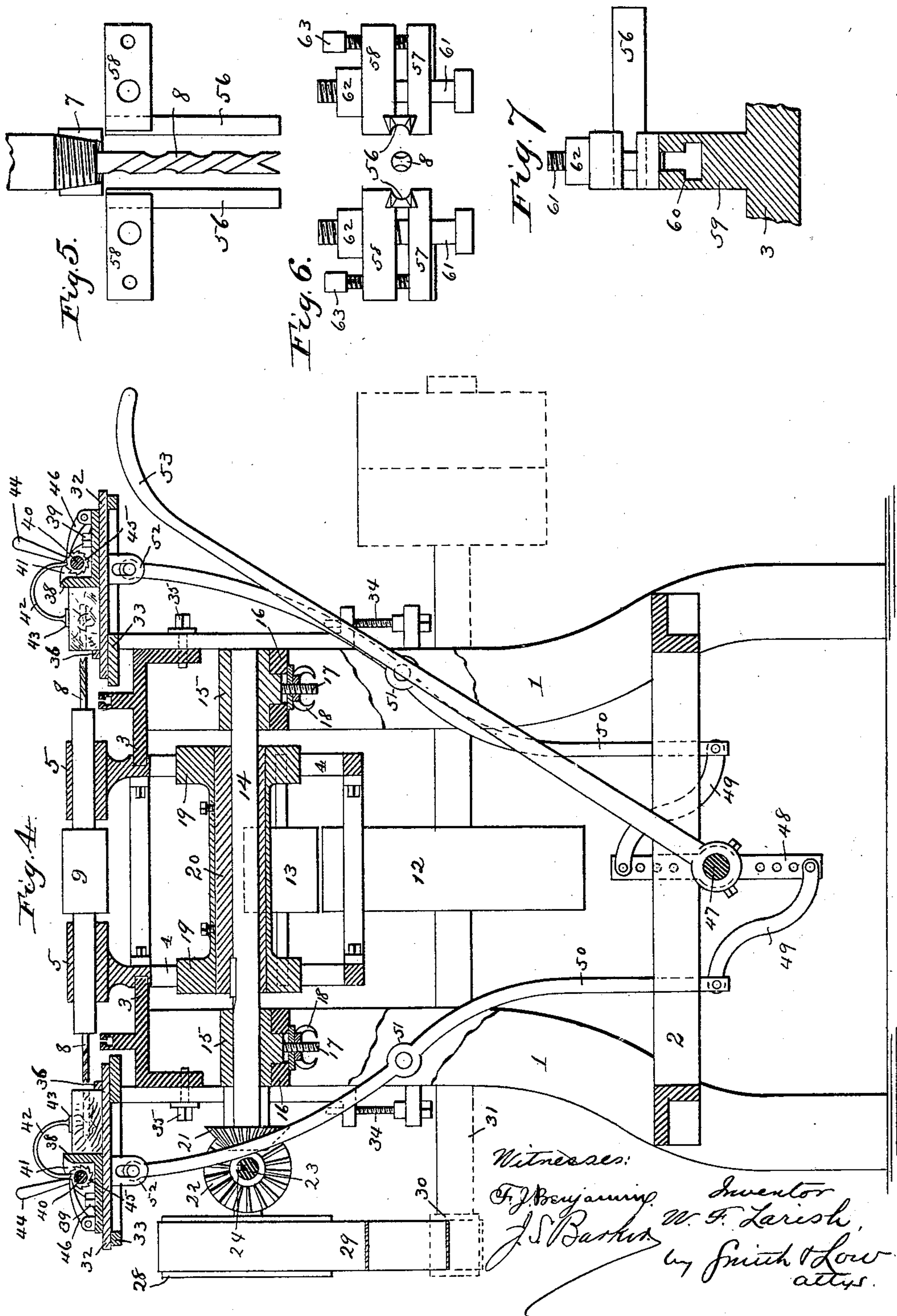
Witnesses:-
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W. F. LARISH.
MORTISING MACHINE.

No. 481,039.

Patented Aug. 16, 1892.



UNITED STATES PATENT OFFICE.

WILBUR F. LARISH, OF OSHKOSH, WISCONSIN.

MORTISING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 481,039, dated August 16, 1892.

Application filed October 30, 1891. Serial No. 410,379. (No model.)

To all whom it may concern:

Be it known that I, WILBUR F. LARISH, a citizen of the United States, residing at Oshkosh, in the county of Winnebago and State of Wisconsin, have invented certain new and useful Improvements in Mortising-Machines; and I do 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.

It is the object of my invention to provide a mortising-machine especially adapted for use in the manufacture of door and blind stiles and capable of being employed for other useful purposes by which labor is lessened and the turning out of work of a better and more uniform character is accelerated.

My improvements relate to the means for supporting and actuating the mortising-tools, to the devices for adjusting them to meet the requirements of different pieces of work as to the situation of the mortises, to the means for determining the length of the mortises, to the appliances whereby the work is held adjusted and presented to the mortising-tool, to auxiliary cutting devices whereby the stile or other piece of work may be slotted at one or both ends during the mortising operation, and to other features hereinafter fully explained.

My invention, having such general objects in view and relating principally to said parts of the machine, consists in the mechanical devices and combinations thereof hereinafter particularly set forth and claimed.

In order to make my improvements more clearly understood, I have shown in the accompanying drawings means for carrying the same into practical effect without, however, intending to limit myself to the particular construction which, for the sake of illustration, I have delineated.

In said drawings, Figure 1 is a side view of a gang mortising-machine embodying my improvements. Fig. 2 is a longitudinal sectional view of the same. Fig. 3 is a plan view of a portion of the same. Fig. 4 is a transverse sectional view on line 4 4 of Fig. 1. Figs. 5, 6, and 7 are detail views illustrating the fin-

ishing-chisels and the means for securing and adjusting them.

Referring to the drawings, 1 1 indicate side frames of suitable construction and material to support the working parts of the machine. They are connected at suitable points by cross-rails 2. At or near the top of the machine the longitudinal rails of the frame are provided with guiding edges or ways 3, upon which are mounted in such manner as to be adapted for longitudinal reciprocation frames 4. The latter are provided with bearings 5, in which are mounted one or more transverse shafts 6, the ends of which have suitable tool-holders 7, Fig. 5, adapted to receive mortising-tools. The latter may be twist-bits of the form shown at 8. The number of frames 4 and shafts 6 in each frame may be varied in accordance with the number and situation of the mortises to be produced.

Each of the shafts 6 is provided with a pulley 9, over which passes a driving-belt. I prefer to employ a single belt 10 for all of the pulleys, arranging it as best seen in Fig. 2, where the belt is shown as passing around two main pulleys 11 and 12, one of which is the driving-pulley for the machine, thence under idler-pulleys 13, mounted on the frames 4, and from said idler-pulleys over the shaft-pulleys 9. The shafts 6 may thus be rotated in the same direction, and the arrangement of the belt 10 is such that the frames 4 may be longitudinally reciprocated without taking up or slackening said belt.

14 indicates shafts passing transversely through the frames 4 and mounted in bearings 15, which are adjustably secured upon the longitudinal slotted frame-rails 16 by clamp-screws 17 and nuts 18. The shafts 14 are provided each with one or more eccentrics 19, which engage the opposite sides of the frame 4, and are adapted when the shafts are rotated to reciprocate said frames upon the guides 3. It will thus be understood that if the rail to be mortised be presented to the ends of the tools 8 and moved gradually toward the latter while they are rotated and reciprocated by the means above described a mortise will be produced in the rail by each tool of a width equal to the diameter of the tool, each

mortise also being of a length equal to the length of reciprocation of the tool and its carriage 4.

I have further provided for an adjustment 5 of each eccentric 19 independently of the others, whereby each tool may produce a mortise of the length desired and all of the mortises in the rail made of different lengths when necessary. I prefer to effect such adjustment 10 by means of internal eccentrics 20, rigidly secured to the shafts 14 and fitting within the eccentrics 19. By turning the eccentrics 19 upon eccentrics 20 and then securing them in place any desired length of reciprocation for 15 the frames 4 and mortising-tools may be secured—say from naught to three and one-half inches.

The shafts 14 receive their motion from miter-gears 21 upon their outer ends, Figs. 1 20 and 4, which are engaged by similar gears 22, the latter being fixed upon a longitudinal shaft 23 in such manner (as by a groove 24 in the shaft and a pin or other internal projection on the gear) that they will rotate with 25 the shaft, but may be adjusted longitudinally upon it to any desired position. This latter adjustment is effected, to correspond with the adjustment of shafts 14, by the clamps 17 18, already described. By this means the frames 30 4, with their mortising-tools, may be located at any desired positions in the length of the machine, so as to be capable of producing mortises at any required points in the rails or stiles which are being operated upon. The 35 shaft 23 is driven by any suitable mechanism, such as miter-gears 25 and 26, the latter being carried by a transverse or stud shaft 27. The latter also carries a pulley 28, to which extends a belt 29 from and driven by a pulley 40 30 on the power-shaft 31.

The stile or other piece to be mortised is to be clamped upon and moved by a suitable carriage adapted to present it to the ends of the mortising-tools.

45 I may here remark that while I prefer to provide both ends of the shafts 6 with mortising-tools, (those upon one side having a left-hand twist,) so that two stiles may be operated upon at once, and have illustrated 50 such construction, a simpler machine embodying my improvements in part can be made which will be adapted to operate upon but one stile at a time. The work carriages or tables are indicated at 32 and are mounted 55 so as to be capable of reciprocation in lines transverse to the machine upon vertically-adjustable tables 33. The latter receives such vertical adjustment by which the mortise can be formed at the proper point between the 60 top and bottom surfaces of the stile as it lies upon the carriage 32, from a screw 34, Fig. 4, and when adjusted is clamped firmly in place upon the main frame by bolts 35.

36 indicates a slight flange, against which 65 the inner edge of the stile is held when in proper position to be operated upon, said

flange being formed with or attached to the plate of the table 32.

37 indicates angle-pieces mounted upon said table or carriage and having at their inner ends flanges 38, adapted to be placed 70 snugly against the outer sides of the stiles, whereupon said parts 37 may be secured by bolts 39, passing through slots in the parts and engaging the bottom plate of the carriage. 75

40 is a rock-shaft extending along the carriage from end to end, or nearly so, and mounted in bearings 41 upon the angle-piece 37. This shaft carries spring-clamps 42, having 80 feet 43, adapted to bear upon the top surface of the stile and to force the latter down firmly upon the plate of the carriage, thus not only holding the stile in place, but straightening it and insuring the proper and exact 85 location of the mortises. A handle 44 serves to rock the shaft 40 inward, which movement brings the clamps 42 into operation. A ratchet and pawl 45 46 maintains the adjusted position of the shaft and the clamping-force 90 of the parts 42.

The carriages 32, having the stiles secured upon them in the manner above described, may be caused to approach the mortising-tool by any preferred mechanism. I employ devices whereby the operator can simultaneously 95 actuate both of the carriages.

47 is a longitudinal rock-shaft supported in bearings on the frame-rails 2 and extending from end to end of the machine. This shaft 100 is provided with arms 48, which are connected by links 49 with the lower ends of levers 50, which are fulcrumed at or near their middle upon brackets 51, extending from the main frame. One of the levers 50 is situated at 105 each end of each carriage 32 and is loosely pivoted or connected to or with a depending lug 52, which extends downward through a suitable aperture in the table 33, the upper end of the lug being attached to or formed 110 with the carriage 32. The links 49 of the levers upon one side of the machine are connected with the lower ends of the arms 48, while upon the other side of the machine said links are connected with the upper ends of the arms. 115 The turning of the shaft 47 will therefore cause the carriages 32 to approach or recede from the mortising-tools simultaneously. The turning of the shaft for this purpose is effected by the hand-lever 53. 120

54 indicates chisel-shaped cutters attached to the end frames 4 in such position as to cut channels or slots of any desired depth in the edges adjacent to the ends of the stiles. These cutters are adjustably secured upon the 125 frames 4 by bolts 55.

In operation the chisels 54 reciprocate with the mortising-arbors 8, coming up to and moving away from the tools 56 without running against or passing the latter. 130

In order to square the ends of the mortises, I provide chisels 56, which are held at each

side of the cutting-tool, Figs. 5, 6, and 7, between clamping-blocks 57 58, the former being mounted upon a longitudinal rail 59, which may be integral with the guide 3 and
 5 which is provided with a longitudinal undercut groove 60. T-headed bolts 61 are adapted to fit said groove and extend upward through the blocks 57 and 58 and are provided on their upper ends with clamping-nuts 62, by
 10 which the chisels are secured.

63 is an auxiliary spacing-bolt, which engages by its screw-thread the block 58, bears upon the block 57, and is adapted to co-operate with the bolt 61 in clamping the chisel.

15 Having thus described my invention, what I claim is—

1. In a mortising-machine, the combination of a series or gang of mortising-tools, independent reciprocating carriages for the
 20 same, transverse shafts movable with and having adjustable means for reciprocating the carriages, a power mechanism and adjustable connections between the same and said shafts for actuating the latter, and means
 25 for rotating said tools, substantially as set forth.

2. In a mortising-machine, the combination of guides 3, a series of frames adjustable on and adapted to be reciprocated on said guides,
 30 a shaft and mortising-tool mounted on each frame, means for rotating said shafts, a common power mechanism for reciprocating the said frames, and power devices for reciprocating the frames movable with said frames
 35 and having adjustable connections with said common power mechanism, substantially as set forth.

3. In a mortising-machine, the combination, with suitable guides, of a series of frames adjustable on and adapted to be reciprocated on
 40 said guides, a shaft and mortising-tool mounted on each frame, means for rotating said shafts, transverse adjustable shafts connected and movable with said frames and having
 45 devices for reciprocating the latter, and means for actuating the latter shafts, substantially as set forth.

4. In a mortising-machine, the combination, with a main frame having suitable guides, of
 50 a series of frames adjustable on and adapted to be reciprocated on said guides, a shaft and mortising-tool mounted on each frame, means for rotating said shafts, transverse shafts 14, connected with and adapted to reciprocate
 55 the said frames, bearings 15 for the latter shafts adjustable on the main frame, and a power mechanism having adjustable connections with the latter shafts, substantially as set forth.

60 5. In a mortising-machine, the combination of a series or gang of mortising-tools, independent reciprocating carriages for the same, actuating mechanism for the tools, comprising
 65 a series of transverse shafts and eccentrics and a longitudinal driving-shaft connected therewith, and means for regulating the length

of reciprocation of the carriages independently from each other, substantially as set forth.

6. The combination of a series of frames or
 70 carriages adapted to support the mortising-tools, shafts connected with and adapted by suitable means to reciprocate said carriages and having gear-wheels, adjustable bearings
 75 for said shafts, whereby said tools may be located at any desired point in the length of the work, a longitudinal shaft having gear-wheels adjustable thereon and adapted to engage said
 80 first-mentioned wheels, substantially as set forth.

7. The combination of a series of carriages
 4, adapted to support the mortising-tools, transverse shafts 14, having means for reciprocating said carriages and provided with miter-wheels 21, adjustable bearings for said
 85 shafts, the longitudinal shaft 23, adjustable miter-wheels 22 on the latter shaft, and means for rotating the longitudinal shaft and the mortising-tools, substantially as set forth.

8. The combination of a series of reciprocating frames or carriages, transverse shafts
 90 mounted thereon and adapted to carry a mortising-tool, a single belt connected with said shafts for rotating them, transverse shafts having eccentrics adapted to reciprocate said
 95 frames or carriages, and means for actuating the latter shafts and said belt, substantially as set forth.

9. The combination, with the frames or carriages 4, having tool holding and actuating
 100 devices, of the shafts 14, having the internal eccentrics 20 and external eccentrics 19, adjustable upon the eccentrics 20 and adapted to reciprocate said carriages, substantially as set forth.
 105

10. The combination, with the mortising-augers and reciprocating holders therefor and the rail 59, of the stationary chisels 56 and
 110 clamps for holding the same longitudinally adjustable upon said rail, substantially as set forth.

11. The combination, with the reciprocating frames or carriages 4 and the shafts 6, adapted
 115 to carry a mortising-tool, of the slotting-chisels 54, mounted on said carriages and extending in the direction of movement of the latter, substantially as set forth.

12. The combination, with the duplicate oppositely-directed reciprocating mortising
 120 devices, of the work-carriages 32 32, situated upon opposite sides of said devices, and an actuating mechanism connected with both of said carriages and adapted to move them toward and from the mortising-tools, substantially as set forth.
 125

13. The combination, with the mortising devices, of the carriage 32, the levers 50, the links
 130 49, the rock-shaft 47, connected with said links, and means for operating said shaft, substantially as set forth.

14. The combination, with the carriage 32 and the mortising devices, of the vertically-

adjustable table 33, the levers 50, having a slotted connection with the carriage, and means for oscillating said levers and reciprocating said carriage thereon toward and from the mortising devices, substantially as described.

15. The combination, with the mortising devices, of the work-holding clamps comprising the rock-shaft 40, spring-clamps 42, mounted thereon, the ratchet-wheel 45 on the shaft, the

pawl 46, engaging said ratchet, and means for turning said shaft, substantially as set forth.

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

WILBUR F. LARISH.

Witnesses:

BYRON E. VAN KEUREN,
FRANK A. LARISH.