No. 705,940. Patented July 29, 1902.

H. MARLES.

FEED MECHANISM.

(Application filed Feb. 24, 1902.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

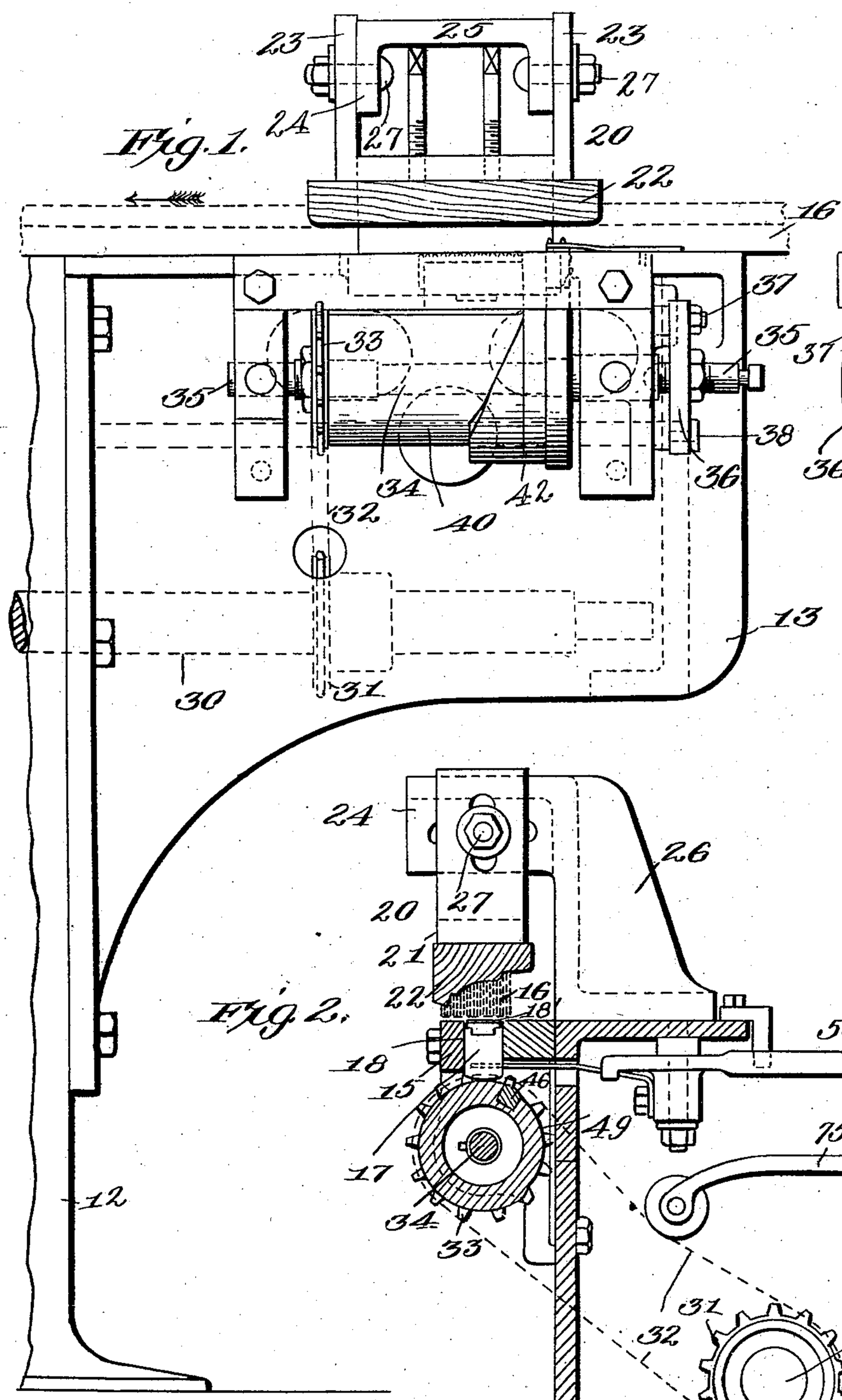

Fig. 3.

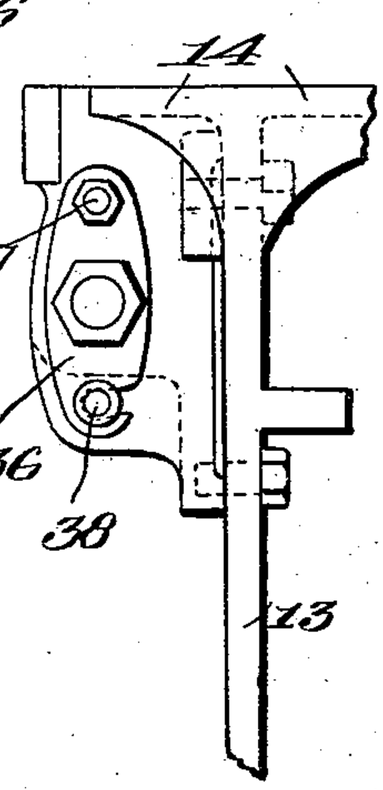

Fig. 2.

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W. B. Taylor

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(No Model.) 2 Sheets—Sheet 2.

Fig. 4.

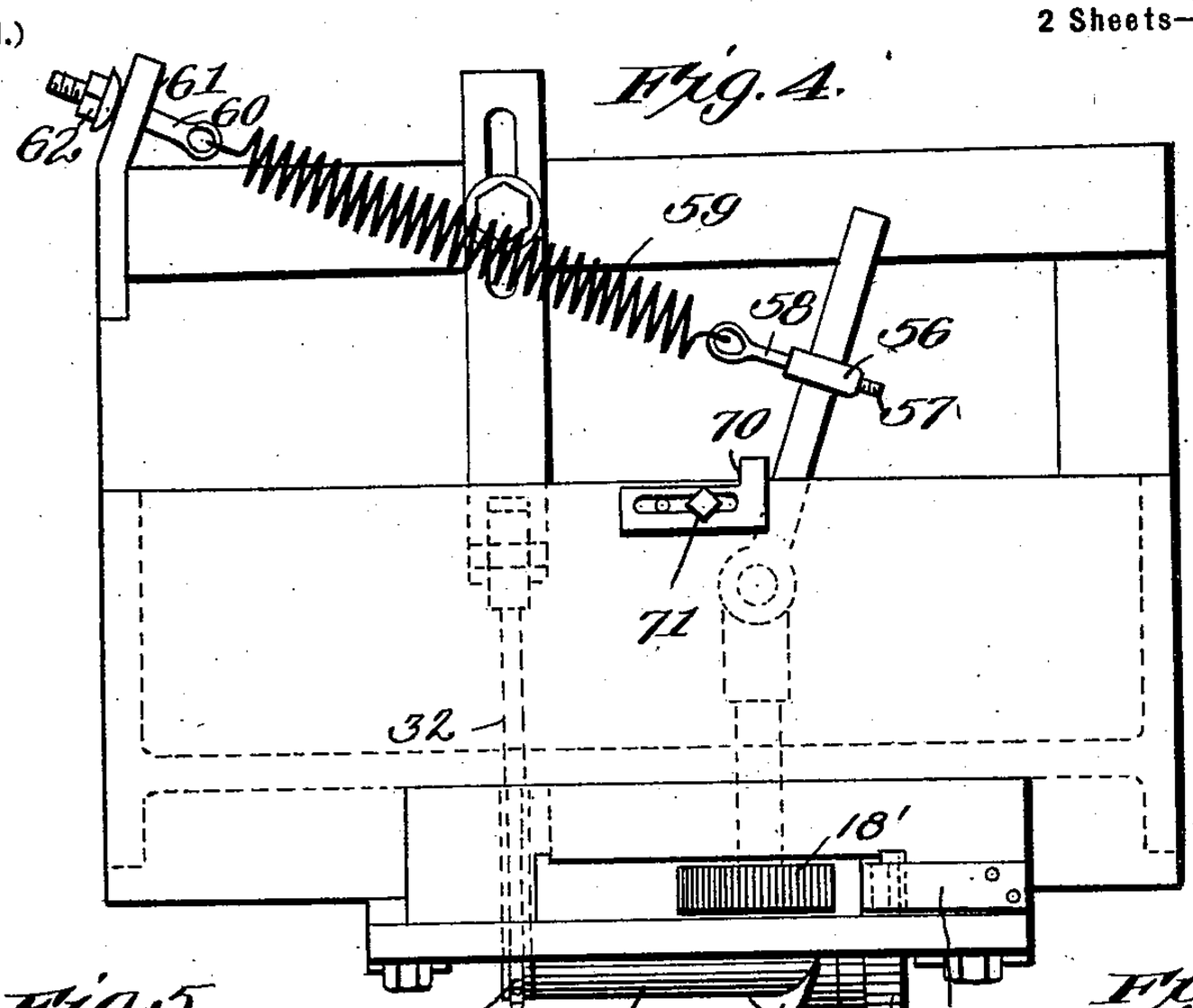

Fig. 5.

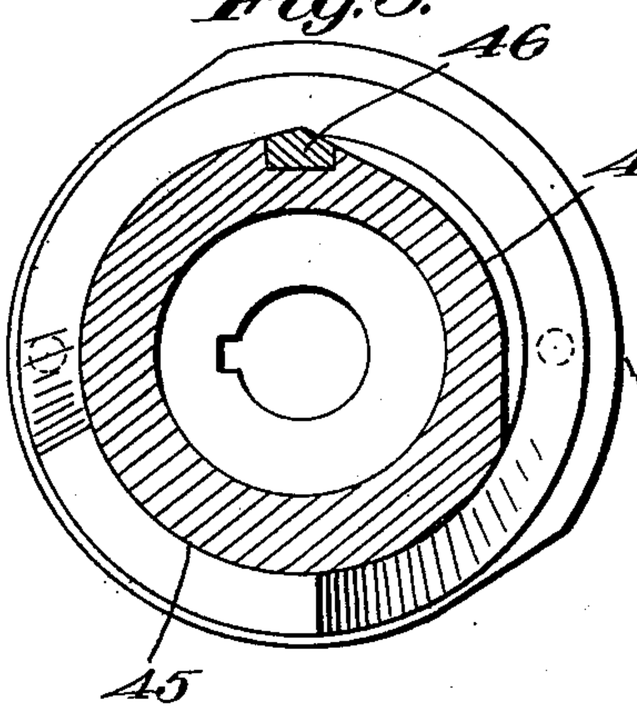

Fig. 6.

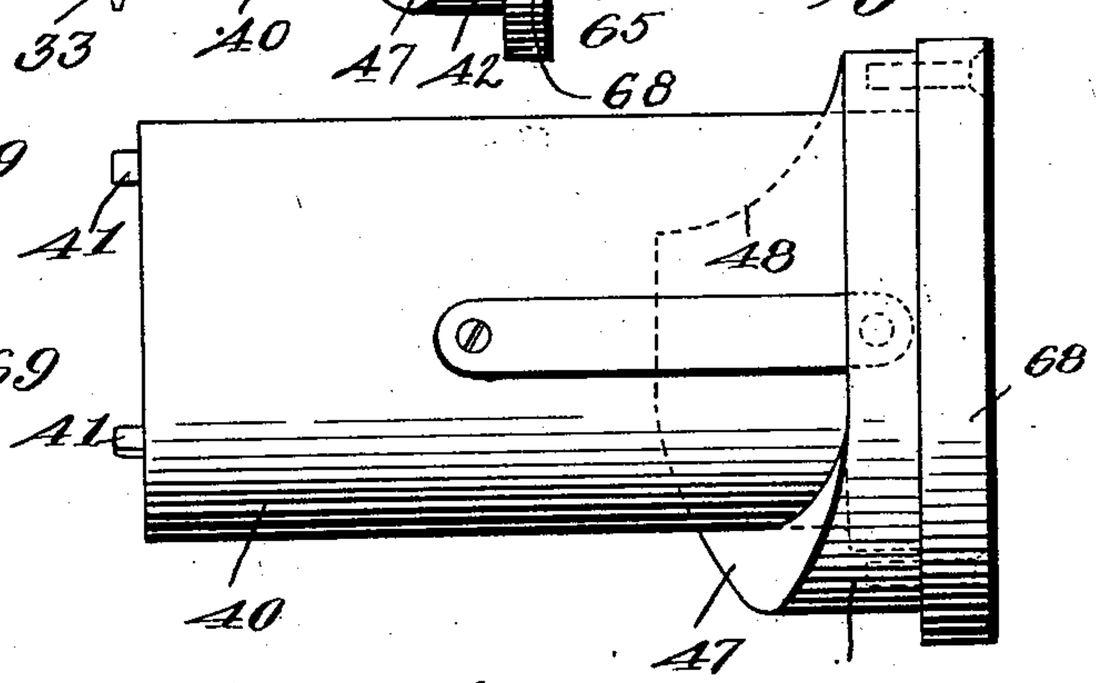

Fig. 7.

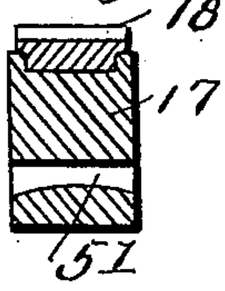

Fig. 8.

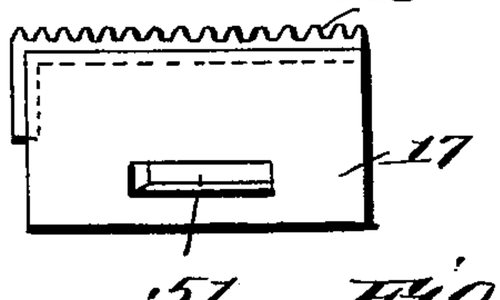

Fig. 9.

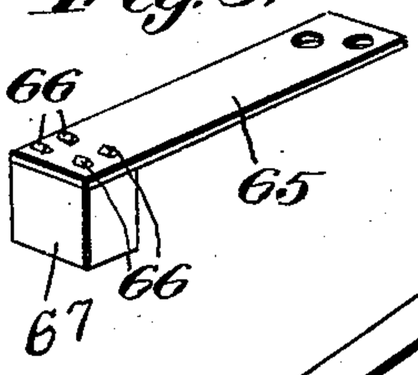

Fig. 10.

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UNITED STATES PATENT OFFICE.

HENRY MARLES, OF MANOR PARK, ENGLAND.

FEED MECHANISM.

SPECIFICATION forming part of Letters Patent No. 705,940, dated July 29, 1902.

Application filed February 24, 1902. Serial No. 95,282. (No model.)

To all whom it may concern:

Be it known that I, HENRY MARLES, a subject of the King of Great Britain, residing at Oaklands, 67 Essex road, Manor Park, E., England, have invented new and useful Improvements in Feed Mechanism Applicable to Wood-Molding-Carving Machines, of which the following is a specification.

This invention relates to what I shall for convenience term a "feed mechanism applicable to wood-molding-carving machines," although it will be obvious from the following description that the improvements may be used with facility in other connections, and therefore the invention is not restricted to a use in any particular art.

The invention is shown in one simple embodiment thereof in the accompanying drawings, forming a part of this specification, and in which—

Figure 1 is a front elevation of a feeding mechanism applied to a wood-molding-carving machine, simply a portion of the latter being shown. Fig. 2 is a transverse sectional elevation of the same as seen from the right in Fig. 1. Fig. 3 is an end elevation of a support for a cam-shaft. Fig. 4 is a plan view of the parts shown in Figs. 1 and 2. Fig. 5 is a transverse sectional elevation of a compound cam as seen from the left in Fig. 1. Fig. 6 is a top plan view of the same. Fig. 7 is a cross-section of a feed member, and Fig. 8 is a front elevation of the same. Fig. 9 is a perspective view of a device for holding the work, and Fig. 10 is a similar view of an actuating-lever.

Like characters refer to like parts in the drawings.

I desire at this point to state that the invention is not limited to the exact construction shown in the drawings and hereinafter described in detail, for many variations may be made within the scope of the claims succeeding this description.

In Fig. 1 I have shown the right end of the framework 12 of a wood-molding-carving machine to which my feed mechanism is especially applicable, the feed mechanism being sustained by a bracket, as 13, bolted or otherwise secured to the framework 12. The bracket 13 has at its top oppositely-disposed flanges, as 14, in line with each other and with the table of the carving-machine, the flanged structure being adapted to support the work, which, it will be understood, is a molding that is to be fed toward the carving-machine for operation thereby.

The feed mechanism includes in its construction a plate or block, as 15, set into an aperture or slot in the forwardly-projecting flange 14, and the upper surface of which is flush with said flange, whereby the said block constitutes, in effect, a part of the table or bed for sustaining the traveling work, (designated by 16 and shown in dotted lines in Fig. 1,) the arrow in said figure indicating the direction followed by the work. The work, as will be understood in the present case, consists of wood molding.

I provide a feed member and mechanism for advancing the feed member toward the work, then moving said feed member in a direction to feed the work, then moving the same away from the work and finally returning said member to its initial position. Said feed member and mechanism may be of any suitable construction, and the former operates in connection with a member to momentarily clamp the work, then feeding the same longitudinally and then to release the work, the feed member being reciprocatory and the coöperating clamping member being stationary relatively thereto.

The feed member is denoted by 17, and it is substantially rectangular in construction, it being disposed in the slot 18, extending longitudinally of the block or plate 15.

The effective or working surface of the feed member 17 is roughened, and this may be secured by teeth, as 18′, on the upper surfaces of the feed member.

The roughened surface of the feed member is not coarse, it being of an efficiency just sufficient to secure a good grip upon the under side of the molding, so that it can properly move the same forward, and yet light enough, so as not to mar the same. The teeth 18′ in the present case are formed upon the longer leg of a substantially L-shaped bar set into a correspondingly-shaped groove in the upper face, and what is shown is the left side (see Fig. 8) of the feed device and suitably held

therein. The said bar, which carries the teeth, is preferably made of steel, though of course this is not essential.

The feed member has primarily an ascending movement into contact with the work, then a movement longitudinally of the machine, which in the present instance is toward the left, then a descending movement, and finally a longitudinal return movement, it being understood that on the advancing longitudinal movement the feed member pushes the work 16 toward what is shown as the left in Fig. 1.

I have herein shown and described certain mechanism for securing the requisite function of the feed member; but it will be evident that other means could be employed with equal advantage for securing the same end.

The feed member 17, which, it will be understood, has a sliding movement in the longitudinal slot 18', operates in conjunction with a clamping member, against the under side of which the work is forced by the feed member on its ascending movement and along the under side of which the work is slid when it is making its advancing movement.

The clamping member 20 has a yoke-shaped member 21, and to the under side of the base of which a pad, as 22, is suitably secured. What is shown as the under surface of the pad has a contour to agree with that of the molding being operated upon and against which the face of the molding is adapted to abut when elevated by the feed device. The vertical arms 23 of the yoke are fitted against the outer faces of the vertical flanges 24, which depend from the head 25 of the bearing 26, which latter is bolted or otherwise fastened to the rearwardly-projecting flange 14. The arms 23 are vertically slotted to receive the bolts 27, which bolts also pass through horizontal slots in the side flanges 24 of the head. By virtue of the construction just described the clamping member can be adjusted either vertically or horizontally by loosening the nuts of the bolts 27, and when the proper adjustment is secured the nuts can be tightened.

A part of the main shaft of the machine is shown at 30, or said shaft may be one driven from the main shaft, and suitable mechanism is interposed between the shaft 30 and the feed device for causing the latter to move through the desired path. The shaft 30 is shown as carrying a sprocket-wheel 31, adapted to receive the sprocket-chain 32, which also passes around a sprocket-wheel 33, keyed or otherwise secured to the short shaft 34, supported by suitable bearings depending from the block 15 and having sockets in its ends to receive the pivot-screws 35, the pivot-screw on the right passing centrally through a cross-head 36. The said cross-head 36 receives at its top a screw 37, tapped into the adjacent bearing for the shaft 34, while the said cross-head is notched or slotted at its lower end to fit over a projection or stud 38 upon said bearing. By removing the pivot-screw 35 on the right the cross-head 36 can be swung out so as to facilitate the removal of the shaft 34.

The necessary reciprocation of the feed member 17 is secured in the present case by a duplex cam combined with springs, as will hereinafter appear, though, of course, other means could be provided for securing this operation.

The driven shaft 34, which is preferably operated at a speed equal in that of the main or driving shaft 30, carries a cam, as 40, of the roll kind, which is keyed or otherwise suitably secured thereto, the cam having at one end projections, as 41, adapted to enter correspondingly-shaped seats in the adjacent faces of the sprocket-wheel 33. In the present case the advancing movement of the feed member toward the work is in an upward direction and the cam 40 is adapted to elevate the feed member, while a second cam, as 42, is adapted to impart a feed or effective movement to the feed member. The effective portion of the cam 40 is upon the periphery thereof, while that of the cam 42 is upon its inner edge, the latter being of the ring type and being adapted to fit over one end of the cam 40 and to be secured thereto in some suitable way. Although the cams 40 and 42 are shown as being separate, the invention is not so limited, for they present, in effect, a single and duplex cam and they might very well be made in one piece.

The effective face of the cam 40 is denoted by 45, and on the rotation of the shaft 34 and when the entering end of said face 45 comes in contact with the bottom of the feed member the latter will be elevated, thereby causing the teeth 18 to slightly enter the work or the molding 16, and near the end of said cam-face it is provided with a hard-steel piece 46, which at about the time the feed member has reached the limit of its upward movement is brought into a position to sustain the work. This steel piece 46 forms, in effect, a track along which the work initially slides, it being fed in this manner by the working face 47 of the ring-cam 42. The steel piece 46 is set into a groove extending longitudinally of the cam 40, and it is conveniently held in place by screws, the heads of which are countersunk in said steel piece, and the latter serves to materially reduce friction as the work commences its movement. The entering end of said face 47 is adapted to engage the outer end of the feed device at about the time the part 46 comes in contact with the under side of said work. It will be understood that the effective face or convex portion 47 of the ring-cam 42 moves the feed member inwardly, so as to slide the work 16 in a corresponding direction. At the time the feed member reaches the limit of its inward movement the concaved face 48 of said cam 42 and

the concentric face 49 of the cam 40 are in contact with the feed member, whereby said feed member can be lowered out of contact with the work and returned to its initial position to repeat the operation, and means hereinafter described are provided for adjusting the working stroke of the feed member.

The return longitudinal movement of the feed member is secured in the present case by a spring-actuated lever, (designated in a general way by 50,) fulcrumed to the under side of the top of the bracket 13. The feed device has an elongated slot 51, adapted to freely receive the arm 52 of the lever 50, which arm is shown as consisting of a flat spring, having at its inner end a downward offset, as 53, adapted to be suitably secured to a flattened face of the hub of the lever 50, said hub having a projection 54, provided with depending lugs 55, through which the spring-arm 52 of the lever passes, whereby lateral play of said spring-arm is avoided. The outwardly-extending or stiff arm of the lever receives a ring, as 56, adjustable thereon and held in the adjusted position by a set-screw 57, said ring being also provided with a projection 58, having an eye to receive the hooked end of the coiled spring 59, the opposite end of said spring having a hook to enter a similar eye in the bolt 60, passing through a projection 61 upon the framework and held in place by check and holding nuts, as 62. By means of the bolt and its nuts the tension of the spring, as will be apparent, can be regulated.

The function of the spring-arm 52 is to lower the feed member, while that of the spring 59 is to impart to intermediate elements a return longitudinal movement to said feed device. When the cam 40 elevates the feed member, the spring 52 will be put into its effective position and maintained in such relation as long as the feed device is held up by the cam but the instant that the working face 45 of said cam passes out of contact with the feed member, the spring 52 will be at once free to return to its normal position and as it does so, it is effective for instantly thrusting the feed member downward into a position in line with that it primarily occupied.

As the feed member 17 is given its effective or advancing longitudinal movement by the working face 47 of the cam 42 the rigid arms of the lever 50 will be swung toward what is shown as the right in Fig. 4, thereby stretching the coiled spring 59, so that when said face 47 passes out of engagement with the feed member the spring will contract, thereby imparting through the intermediate lever a return longitudinal movement to the said feed member which during this period travels along the concaved face 48 of said cam 42.

I provide means for preventing longitudinal retractive movement of the work after it has been moved forward by the feed device 17 and will now describe the means shown for this purpose. A spring-arm is shown at 65, it being located slightly below the path of the work and suitably secured at one end to the framework and having on its upper side, at or near the free end thereof, a series of barbs or prongs, as 66. Said spring-arm has on its under face at said free end a projection, as 67, adapted to coöperate with the cam 68, carried by the shaft 34 and secured to the ring-cam 42 in suitable manner. Just about the time the feed member has reached the limit of its effective movement the working face 69 of said cam 68 will have engaged the under face of the projection 67, so as to press the same, and consequently the spring-arm 65, upward for forcing the prongs or barbs 66 into the work 16, and the cam-face 69 is of such a length as to maintain the prongs in penetration with the work during the descent of the feed member and its return longitudinal movement, and just about the time the feed device has reached its initial position the spring 65 by its own resiliency assumes its normal condition, so as to carry the prongs 66 out of the work, whereby the latter can be fed forward, as previously described.

Means are provided for adjusting the stroke of the feed member, and those shown for this purpose will now be set forth. The framework carries a stop 70, adapted to be engaged by the outer or stiff arm of the lever 50, the shank or body of the stop being longitudinally slotted to receive the screw 71, tapped into the framing, and by loosening which the stop can be adjusted. On the advancing movement of the feed member the outer arm of the lever 50 is moved away from the stop 70, and on its return movement to its initial position it is caused to abut said stop. By moving the stop 70 toward the right in Fig. 4 the stroke of the lever 50, and hence of the feed member 17 actuated thereby, will be shortened.

In connection with the sprocket-chain 32 I provide means for taking up the slack thereof, such means including an arm 75, having an antifriction-roller at its inner end adapted to engage the chain. Said arm is longitudinally slotted to receive the screw 76, which is threaded into the framework of the machine, and by loosening which the arm 75 can be moved inward to take up looseness in the chain, and when in the desired position the said screw can be tightened to hold said arm.

Having described the invention, what I claim is—

1. In a machine of the class described, the combination of a feed member, means for advancing the feed member toward the work and then moving the same in a direction to feed the work, and an automatically-operable lever adapted to impart a movement to the feed member opposite the direction of feed and having a spring-arm for moving the feed member away from the work.

2. In a machine of the class described, the

combination of a feed member, means for advancing the feed member toward the work and then moving the same in a direction to feed the work, and a spring-actuated lever for imparting a movement to the feed member opposite the direction of feed and having means for moving said feed member away from the work.

3. In a machine of the class described a feed member, means for advancing the feed members toward the work and then moving the same in a direction to feed the work, and a spring-controlled lever, the spring of which is adapted to move the feed member opposite the direction of feed and having a spring-arm adapted to move the feed member away from the work.

4. In a machine of the class described, a feed member having a slot, means for advancing the feed member toward the work and then moving the same in a direction to feed the work, and an automatically-operable lever having a spring-arm fitted in said slot the lever serving to move the feed member in a direction opposite that of the feed and its spring-arm, to move the feed member away from the work.

5. In a machine of the class described, a feed member, means for advancing the feed member toward the work and then moving the same in a direction to feed the work, an automatically-operable lever having a spring-arm, the lever being adapted to move the feed member in a direction opposite to that of the feed, and its spring-arm to move the feed member away from the work, and means for regulating the amount of movement of the feed member.

6. In a machine of the class described, a feed member, means for advancing the feed member toward the work and then moving the same in a direction to feed the work, an automatically-operable lever having a spring-arm, the lever being adapted to move the feed member in a direction opposite to that of the feed, and its spring-arm to move the feed member away from the work, and an adjustable stop disposed in the path of said lever.

7. In a machine of the class described, a feed member, means for advancing the feed member toward the work, and then moving the same in a direction to feed the work, a lever having a spring-arm adapted to move the feed member away from the work, and a coiled spring connected with said lever and adapted through the latter, to operate the feed member in a direction opposite the line of feed.

8. In a machine of the class described, a feed member, a cam adapted to move the feed member toward the work, a second cam for moving the feed member in a direction to feed the work, and a spring-controlled lever having a spring-arm and adapted to return the feed member to the initial position thereof.

9. In a machine of the class described, the combination of a feed member and means for moving it toward and from the work and longitudinally forward and backward, a spring-arm having means to engage the work, and means for positively operating the spring-arm to cause it to engage the work as the backward movement of the feed member begins and for releasing said spring-arm as the forward movement of the feed member begins.

10. In a machine of the class described, a feed member, a cam for moving it toward the work, a second cam for moving the feed device longitudinally to advance the work, means for returning the feed device to its initial position, work-engaging means to prevent the rearward movement of the work during the return of the feed member, and a third cam for operating the work-engaging means.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

HENRY MARLES.

Witnesses:
WALTER J. SKERTEN,
G. F. WARREN.