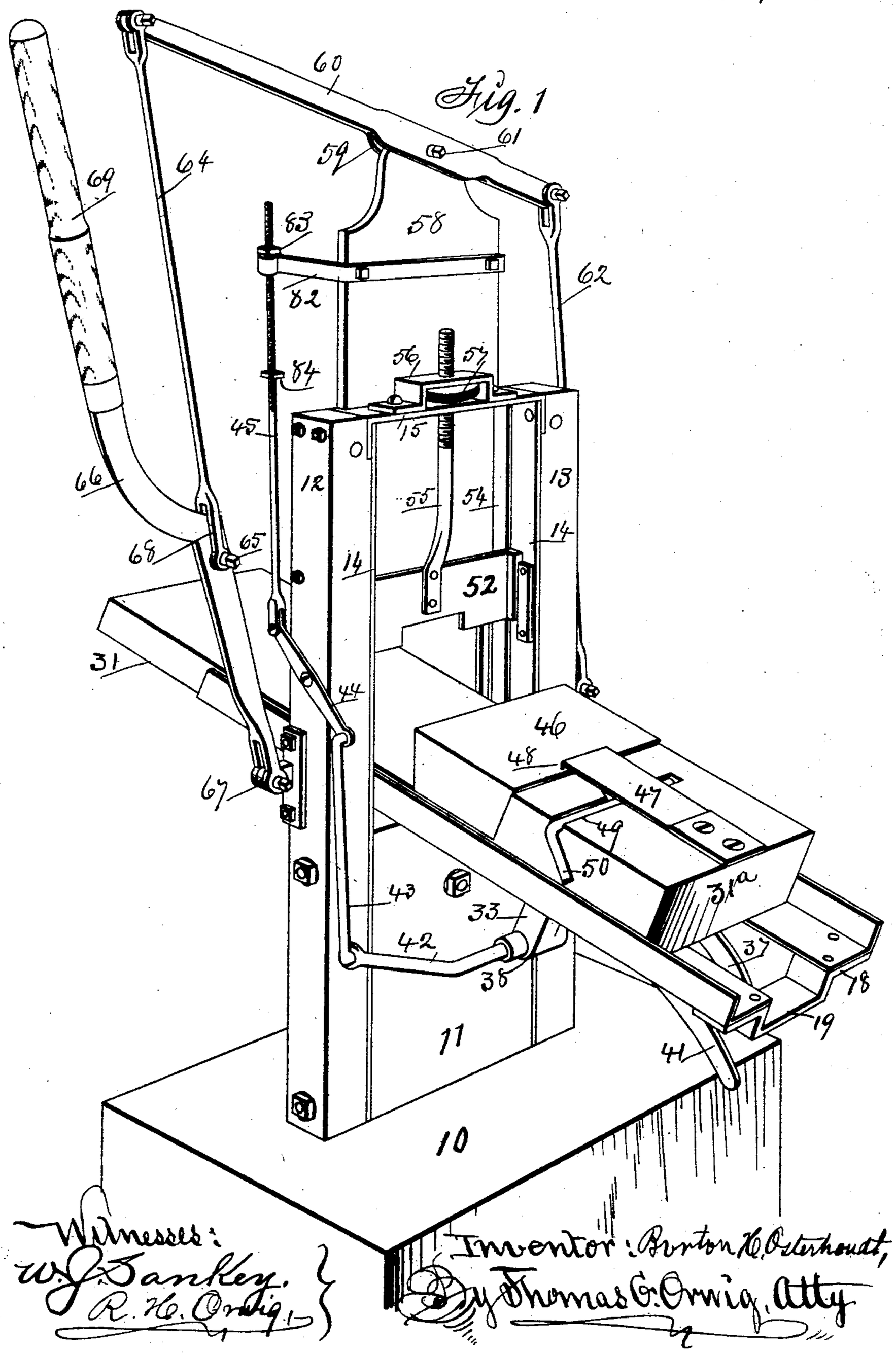
(No Model.) 5 Sheets—Sheet 1.

B. H. OSTERHOUDT.

MACHINE FOR MAKING WOODEN WEDGES.

No. 593,308. Patented Nov. 9, 1897.

Fig. 1



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(No Model.) 5 Sheets—Sheet 2.

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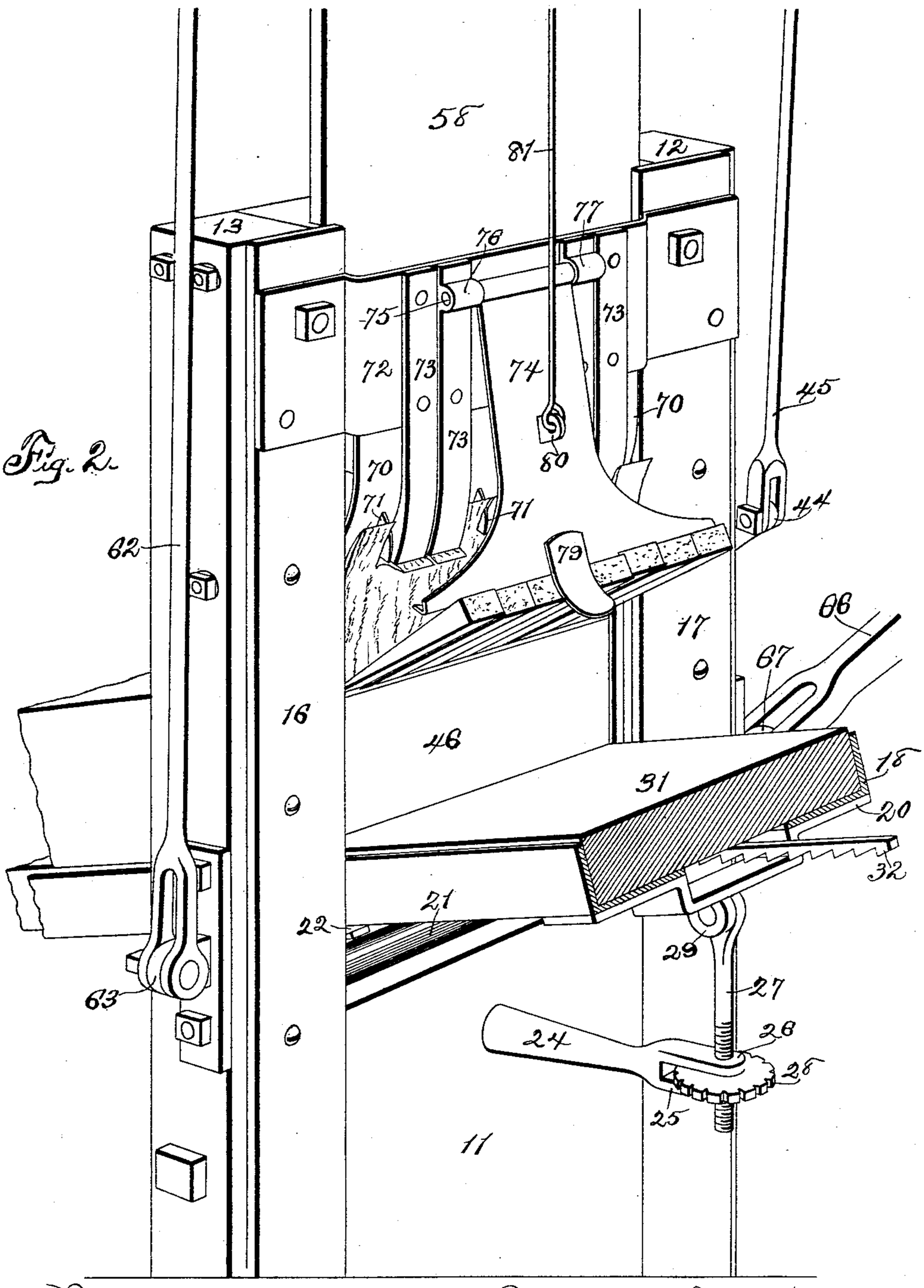
Fig. 2.



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B. H. OSTERHOUDT.

MACHINE FOR MAKING WOODEN WEDGES.

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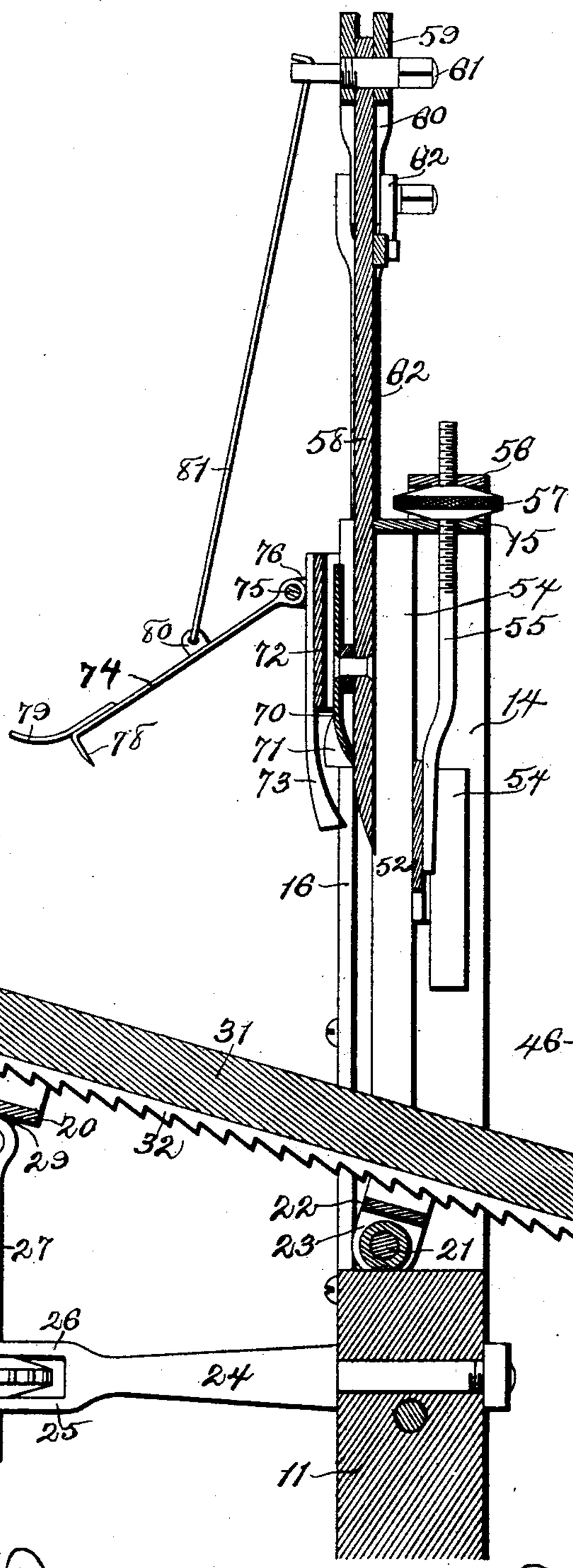

Fig. 3.

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(No Model.) 5 Sheets—Sheet 4.

B. H. OSTERHOUDT.

MACHINE FOR MAKING WOODEN WEDGES.

No. 593,308 Patented Nov. 9, 1897.

Fig. 4.

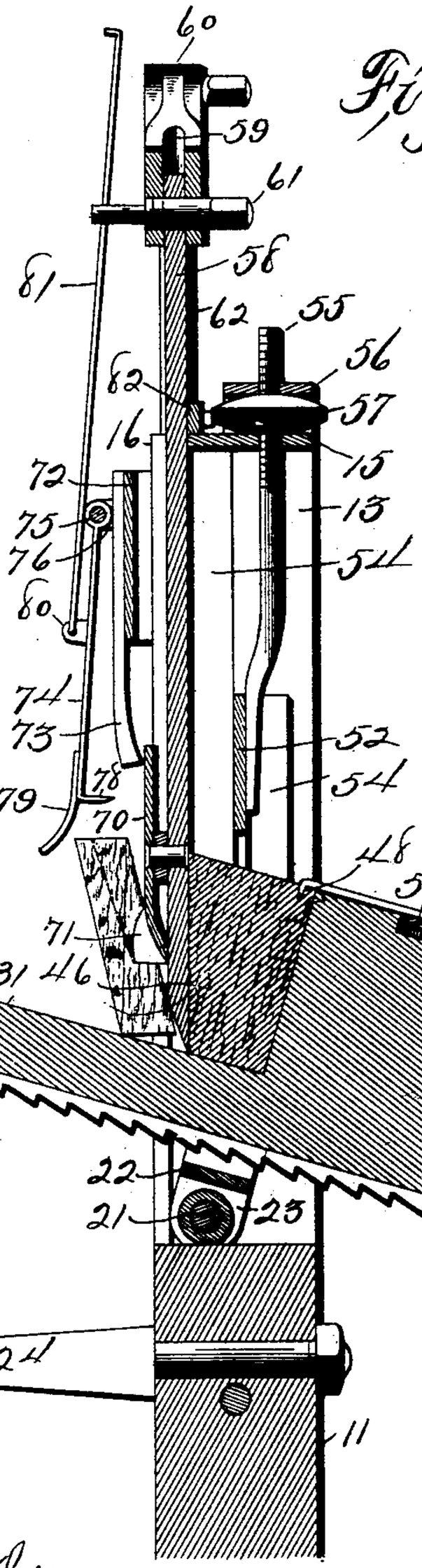
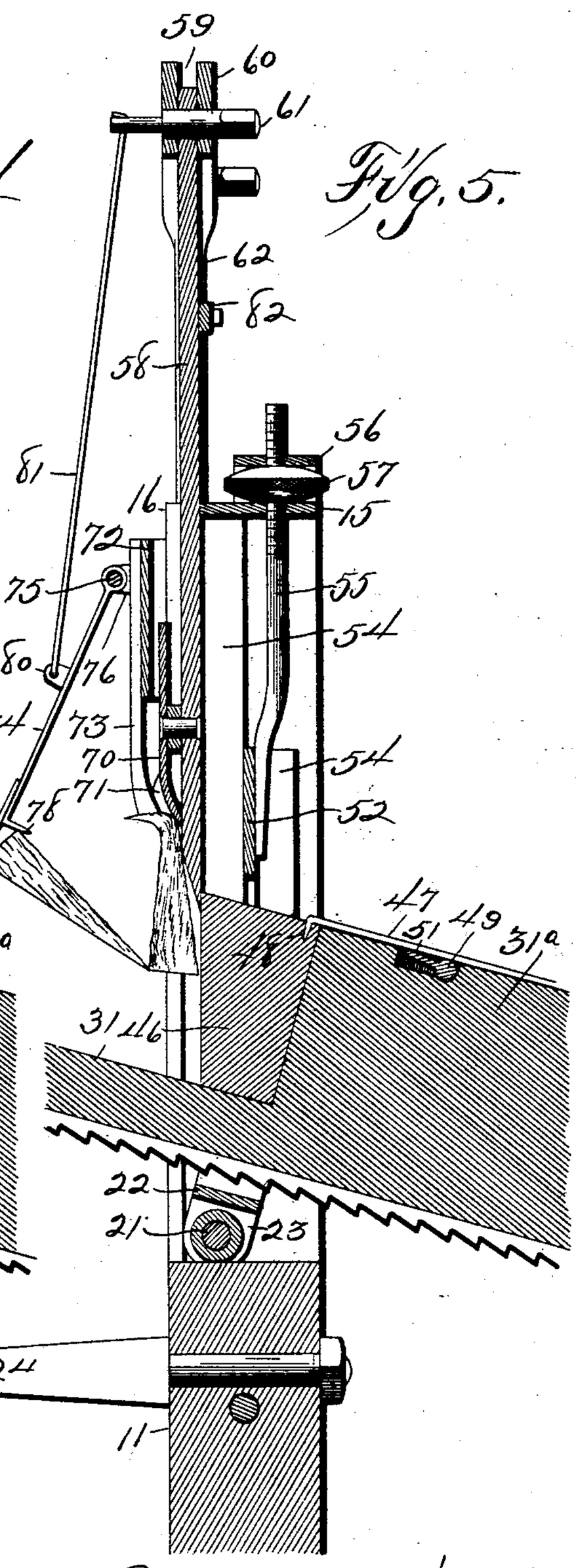


Fig. 5.



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(No Model.) 5 Sheets—Sheet 5.

B. H. OSTERHOUDT.

MACHINE FOR MAKING WOODEN WEDGES.

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Fig. 6.

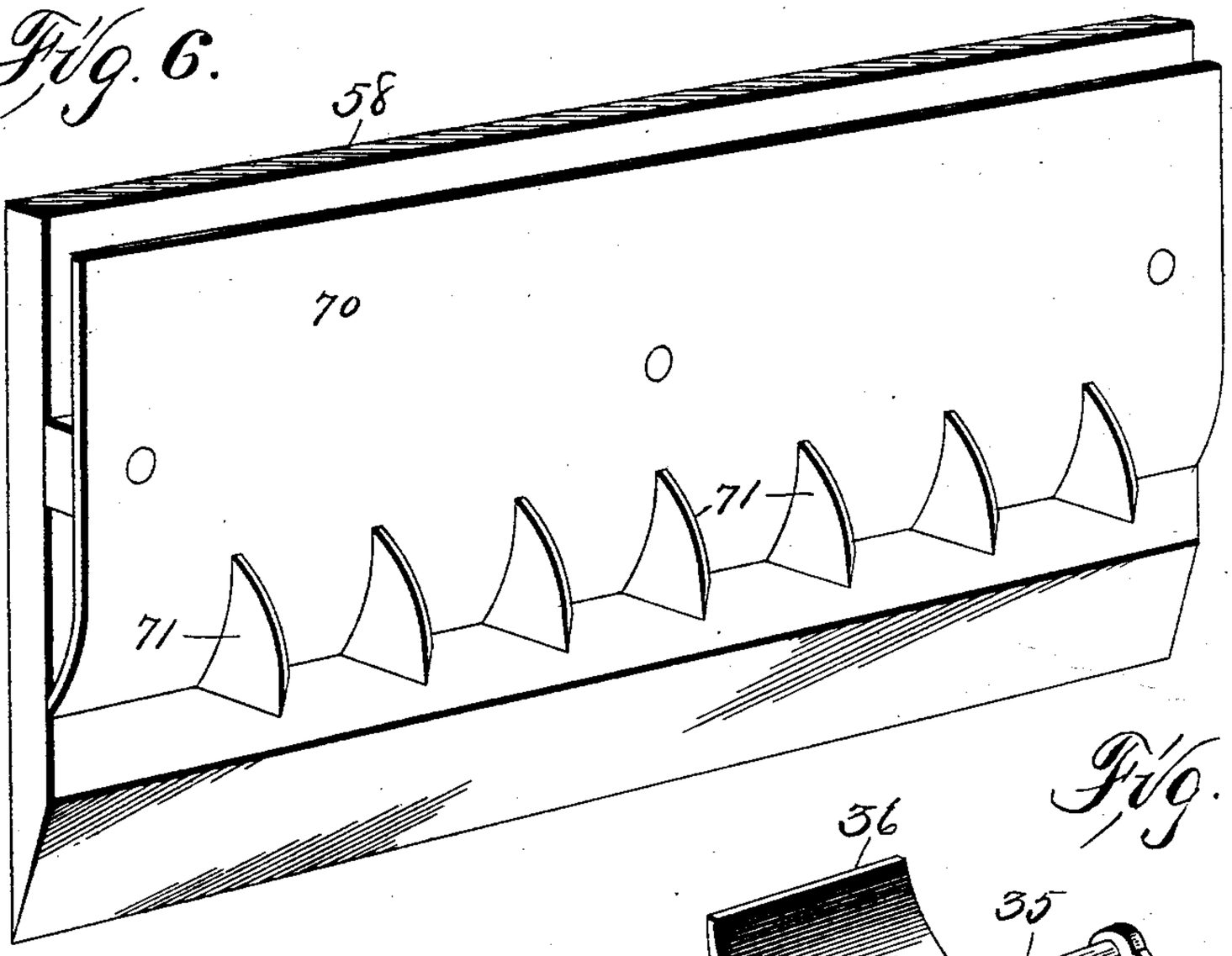

Fig. 8.

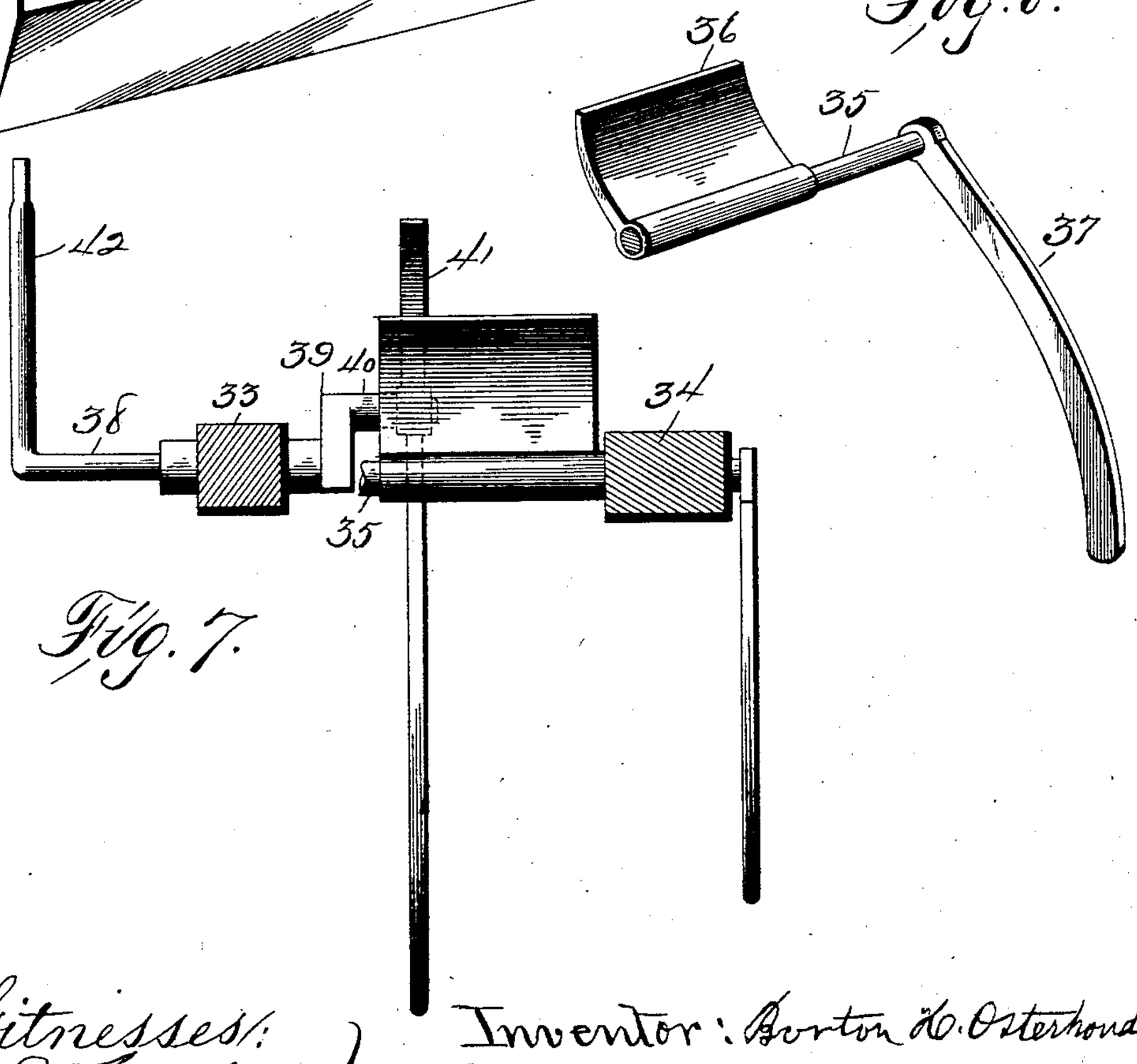

Fig. 7.

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UNITED STATES PATENT OFFICE.

BURTON H. OSTERHOUDT, OF BLOOMFIELD, IOWA.

MACHINE FOR MAKING WOODEN WEDGES.

SPECIFICATION forming part of Letters Patent No. 593,308, dated November 9, 1897.

Application filed June 5, 1896. Serial No. 594,458. (No model.)

To all whom it may concern:

Be it known that I, BURTON H. OSTERHOUDT, a citizen of the United States of America, and a resident of Bloomfield, in the county of Davis and State of Iowa, have invented a new and useful Machine for Making Wooden Wedges, of which the following is a specification.

The objects of this invention are to provide improved means for splitting wooden wedges from a block; means for splitting or subdividing the wedges removed from the block; means for removing the wedges and chip conjunctively, separating the wedges and chip, and removing the chip from the splitting-knife; means for adjusting the machine so that the lengths of the wedges split from a given block may be varied; means for securing the block from which the wedges are split rigidly; means for mechanically advancing the block beneath the splitting-knife intermittently, and means for manually operating the machine.

My invention consists in and the objects of my invention are carried out by the construction, arrangement, and combination of elements hereinafter set forth, pointed out in my claims, and illustrated by the accompanying drawings, in which—

Figure 1 is a perspective of my machine mounted for use, a portion of the operating-lever being broken away. Fig. 2 is a perspective, enlarged, of a portion of my machine, taken from the opposite direction to Fig. 1. Fig. 3 is a sectional elevation through the central portion of my machine. Fig. 4 is a sectional elevation similar to Fig. 3, showing the machine elements in part in the positions assumed when the knife has severed a parallelepipedal section from the block of wedge-timber preparatory to the elevation of said section and the splitting therefrom of wedge portions. Fig. 5 is a sectional elevation similar to Figs. 3 and 4, showing the machine elements in part in the positions assumed when the knife has elevated the parallelepipedal section into engagement with the separator and stops, and showing the separator in the act of performing the function of splitting wedge portions from the said section. Fig. 6 is a perspective of the lower portion of the knife, a plate which diverges the parallelepipedal section from the knife, and the splitting-blades, which subdivide a wedge portion into a series of small wedges. Fig. 7 is a plan, partly in section, illustrating the shape and relative positioning of the advancing and retaining pawls, which form the feed mechanism, whereby the block of wedge-timber is advanced relative to the knife and retained during the operation of cutting. Fig. 8 is a perspective of the retaining-pawl of the feed mechanism.

In the construction of the machine as shown the numeral 10 designates a supporting-base in which is vertically positioned a standard 11, which standard projects above the base 10 and is of less transverse dimensions than said base. The base 10 should be rigidly secured or may be omitted and the standard 11 rigidly secured in a vise or similar clamping-machine which will support the same against oscillation. Side bars 12 13 are fixed to the edges of the standard 11 and extend vertically therefrom in parallel planes. The side bars are made of wood and lined with plates 14, of metal. A metal cap-plate 15 is fixed to the upper ends of and connects the side bars 12 13, which cap-plate is recessed on one side to form a seat or slide-bearing for a knife. Face-plates 16 17 are mounted on the left faces of the side bars 13 12 and project beyond inwardly the side bars and overlap the recessed portion of the cap-plate 15. A track 18 is provided, which track comprises a pair of steel angle-bars connected at their rear ends by a tie-plate 19 and at their forward ends by a tie-plate 20, the said tie-plates being located beneath the angle-bars and so secured thereto as to leave and provide smooth plane upper surfaces for the horizontal portions of said bars. The central portions of the tie-plates 19 20 are depressed angularly to permit of the passage thereover of structural elements, hereinafter to be described. An axle or shaft 21 is mounted rigidly in and through the side bars 12 13, immediately above the upper end of the standard 11, and a bracket 22 is provided having downturned end portions horizontally apertured to receive and rock upon the shaft 21, one of which downturned end portions is indicated in Fig. 3 and marked 23. The central portion of the bracket 22 is depressed angularly to permit of the passage thereover

of structural elements, hereinafter described. The horizontal portions of the bracket 22 at each side of the depressed central portion thereof are secured to approximately the central portion of and connect the angle-bars of the track 18. By this means provision is made for pivoting the track 18 for oscillation relative to the supporting-standard and side bars of the machine, the said track being located between the said bars, and projecting in opposite directions therefrom. A bracket-arm 24 is mounted in the upper end portion of the standard 11 and projects to the left thereof. The outer end portion of the bracket-arm 24 is horizontally bifurcated, and the arms 25 26, formed by said bifurcation, are vertically apertured to admit an adjusting-rod 27 therethrough. The lower end portion of the adjusting-rod 27 is screw-threaded, and an adjusting-wheel 28, interiorly screw-threaded, is mounted on said rod and positioned between the arms 25 26. An ear 29 is formed on or fixed to and projects downwardly from the depressed central portion of the tie-plate 20 and is horizontally apertured to admit a bolt 30, which bolt also traverses an eye formed in the upper end portion of the adjusting-rod 27. By this means provision is made for nicely adjusting the position of the track in any desired plane relative to the horizontal, it being understood, however, that it is not desired at any time to position the track in a vertical plane or a plane approximating to the vertical, and maintaining such position indefinitely, subject only to manual adjustment through the medium of the wheel 28 and rod 27.

Mounted upon the track 18 and resting in the recesses or seats formed by the angles of the steel plates is a cutting-block 31. The main portion of the cutting-block 31 is comparatively thin and extends longitudinally nearly the entire length of the track, and on this block, or rather the thin portion thereof, is mounted the section of wood whereof the wedges are to be made. A minor portion 31ª of the cutting-block is formed on the rear portion thereof and is of such thickness relative thereto as will compass the thickness or height of the wedge-timber in addition to the thickness of the thin portion of the cutting-block. Longitudinally of and centrally located on the lower portion of the entire cutting-block is rigidly secured a ratchet plate, bar, or rod 32, which is of materially greater length than the cutting-block extending outward from the left end thereof. An ear 33 is fixed to and projects downwardly from the angle-bar nearest to the operator, and an ear 34 is fixed to and projects downwardly from the opposite angle-bar, and the said ears are transversely apertured in alinement to admit a rock-shaft 35 below the track and below the ratchet-bar 32. Integrally formed on the central portion of the rock-shaft 35 is a pawl 36 of considerable width and slight thickness, which pawl is curved upwardly toward its extreme edge and into normal engagement with the ratchet-bar 32. A hand-lever 37 is formed on or fixed to the outer end portion of the rock-shaft 35 to the right of or on the side of the machine farthest from the operator and yet beneath one of the bars of the track. A bell-crank lever 38 is fulcrumed in the ear 33 in a horizontal plane materially below the axis of the rock-shaft 35 and is provided with an arm 39, upwardly extending therefrom between the ears 33 34 and a stud 40, horizontally projecting from the upper end of said arm toward the vertical plane of the ear 34, and on said stud 40 is fulcrumed a lever-pawl 41. The left end portion of the lever-pawl 41 is curved upwardly into engagement with the ratchet-bar 32 normally about the space occupied by two ratchet-teeth in advance or to the left of the pawl 36. It is to be understood, however, that the pawls 36 41 do not simultaneously engage operatively with the ratchet-bar, but alternately and intermittently engage said ratchet-bar, the one to move it forward and the other to retain the same against rearward longitudinal movement. The bell-crank lever 38 is provided with an arm 42, extending approximately horizontally at right angles therefrom or approximately at right angles, and the outer end portion of said arm 42 is pivoted to the lower end of a connecting-rod 43, the upper end of said rod being pivoted to the right end of an oscillating lever 44, fulcrumed at its center on the front face of the bar 12 and extending laterally thereof. The left end of the lever 44 is pivoted to the lower end of a vertically-positioned operating-rod 45, the connections and function of said rod being hereinafter described in conjunction with other structural elements.

It has heretofore been observed that the minor portion 31ª of the cutting-block is of materially greater thickness than the major portion of said block. At the line of demarcation between the major and minor portions of the cutting-block is formed an angle, approximately of right degree, in which is located a section of wedge-timber 46, which may be of a length coincident with the length of the minor portion of the cutting-block, the drawings illustrating such timber in the form seen after the same has been operated upon and numerous wedges removed therefrom. The upper face of the wedge-timber 46 should represent the end of the timber or an intersection of the grain thereof, as said timber is so mounted upon the cutting-block as that its grain extends at right angles to the plane face of the thin portion of the block. It might be well to observe here that the cutting-block preferably is made of wood. A leaf-spring 47 is positioned longitudinally and centrally of the upper face of the minor portion 31ª of the cutting-block, and the rear or right end of said spring is secured rigidly to the said block, the forward or left end of said spring being downturned and serrated to form teeth

48, which may engage the upper right corner of the wedge-timber 46 and confine the same in engagement with the face of the left end of the minor portion 31ª of the cutting-block. A rock-shaft 49 is mounted in a recess formed in and transversely of part way across the upper face of the minor portion 31ª, and an arm 50 is formed on said rock-shaft and extends laterally therefrom at the front of the block. A stud 51 is formed on the central portion of the rock-shaft 50 and lies in a recess in the block normally. The function of the rock-shaft lug or stud 51 is to engage the under face of the spring 47 and elevate said spring to release the wedge-timber when the rock-shaft is oscillated by manual actuation of the arm 50 thereon.

It is desirable to provide means for holding the wedge-timber 46 against oscillation upwardly relative to the face of the major portion of the cutting-block, and for such purpose I have arranged a sliding bar 52, mounted between the plates 14, lining the side bars 12 13 and confined at its ends in slide-bearings formed by vertically-positioned oppositely-arranged bars 54 54. The central portion of the lower margin of the sliding bar 52 is recessed to permit of the passage thereunder without contact of the leaf-spring 47. The central portion of the sliding bar 52 has secured rigidly thereto the lower end portion of an adjusting-rod 55, which traverses alining apertures in the top plate 15, and a bracket 56, superimposed upon said top plate, with a space between the same. The upper end portion of the adjusting-rod 55 is screw-threaded exteriorly and carries an interiorly-screw-threaded adjusting-wheel 57 thereon, which adjusting-wheel is located between the upper face of the top plate 15 and the lower face of the bracket 56.

It heretofore has been suggested that the bars 16 17, acting in conjunction with the recessed portion of the top plate 15, formed a slide-bearing for a knife, and a knife is mounted at the rear of the overlapping edges of the said bars and in front and in the recessed portion of the top plate 15 and designated as 58. The lower edge of the knife 58 travels between the bars 54, adjacent thereto, and the rear faces of the face-bars 16 17. The lower margin of the knife 58 is beveled forwardly and upwardly and ground to a sharp edge. The upper end of the knife 58 is inserted into a slotted portion 59, formed a little to one side of the center of an oscillating lever 60, and is pivoted to said lever by a bolt 61, traversing alining apertures in the lever and knife. The rear end of the lever 60, or the end of the lever farthest from the operator, is pivoted to the upper end of a connecting-rod 62 or pivoted fulcrum, and the lower end of said rod or fulcrum is pivoted to a stud 63, formed on the side bar 13, approximately in horizontal alinement with the transverse plane of the central portion of the track 18, and extends outwardly therefrom.

The forward end of the lever 60, or the end of said lever nearest to the operator, is pivoted to the upper end of a connecting-rod 64, and the lower end of said rod is pivoted on a bolt 65, seated in and transversely of an operating-lever, as follows: The operating-lever comprises a stem 66, pivoted at its inner end to a stud 67, fixed to the bar 12, exactly opposite to the stud 63 on the bar 13, and said stem is bent downwardly abruptly at the point indicated as 68, extending downwardly and outwardly a short distance and then again bent gradually or curved into a plane parallel with the plane of the inner end portion of the stem. A handle 69 is fixed to and extends from and in longitudinal alinement with what has been described as the "outer end portion of the lever-stem." It is at a point adjacent to the point of bending (indicated as 68) and between said point 68 and the pivotal point of the lever that the bolt 65, to which the rod 64 is pivoted, is located.

A plate 70 is mounted on the left face of the knife 58, immediately above the beveled portion thereof, and a series of splitting-blades 71—in this instance seven in number—are mounted on and project directly outwardly from the outer face of said plate. The splitting-blades 71 are of a width at their lower ends corresponding very closely to the desired thickness of the wedges to be made by this machine, and the lower edge or margin of the plate 70 is turned inwardly against the face of the knife, so as to provide that the splitting-blades may in their widths extend from a plane in close proximity to the face of the knife outwardly to the outer plane of the wedges when the machine under consideration is in operation. The splitting-blades 71 subdivide the space coincident with the width of the knife into eight equal spaces.

Mounted on and transversely of the left faces of the upper end portions of the face-bars 16 17 is a plate 72, which is pressed outwardly in its central portion out of the plane of its end portions to provide for the passage behind said plate of the plate 70 and cutting-blades 71. The lower end edge or margin of the plate 70 is bent inwardly into close relation with the knife 58 to avoid possibility of contact with the plate 72 or other structural elements about to be described. A series of arms 73 (in this instance four in number) are fixed by their upper portions to the rear face or rather the outer face of the plate 72 and extend below said plate and are curved inwardly at their lower ends into contact with the plate 70. The lower ends of the arms 73 are blunt or squared and are so arranged as to be engaged slightly by the inwardly inclined or curved upper margin of the plate 70 and pressed outwardly thereby. The arms 73 are so disposed relative to the splitting-blades as that they permit the passage between the arms of the blades. A separator 74 is pivoted by means of a pin 75 to ears 76 77 on the upper ends of the bars 73.

The separator 74 is so disposed as normally to lie between the two central individuals of the series of bars 73 and extends downwardly to a horizontal plane materially below the lower ends of said bars. The lower margin of the separator 74 is turned inwardly approximately at right angles to the body portion thereof, is widened to the full width of the knife 58, and serrated to form teeth 78. A lug 79 is formed on the outer face of the lower portion of the separator 74 and is extended downwardly and curved outwardly in opposition to the serrated margin thereof. An ear 80 is formed on the central portion of the separator 74, extends outwardly therefrom, and is pivoted to the lower end portion of a tripping-rod 81, which tripping-rod extends vertically through an eye in one end of the bolt 61 and is bent to form an arm or cross-head (not lettered) above said bolt.

It is desirable to limit and determine the downward movement of the knife 58 in order that excessive pressure applied to the lever-handle 69 may not result in an unnecessary destruction of the cutting-block, and to this end I have provided a stop 82, arranged transversely of the right face of the knife near the upper end thereof and designed to engage the top plate 15 coincident with the engagement of the knife-edge with the upper face of the cutting-block. This determination of the descent of the knife may be adjusted to an extreme nicety, owing to the arrangement whereby the axis of oscillation of the cutting-block is coincident with the axis of reciprocation or rather the plane of rectilinear movement of the knife. The stop 82 is extended forwardly and to the left of the front margin of the knife 58 and is vertically apertured to admit the upper end portion of the rod 45 to traverse the same. The upper portion of the rod 45 is screw-threaded and carries thereon two impact and adjusting-nuts 83 84. It is by means of the projecting portion of the stop 82 in its travels engaging one or the other of the nuts 83 84 that the rod 45 is rectilinearly reciprocated to oscillate the lever 44 and establish the feeding operations located beneath the track which act upon and advance the cutting-block.

In the practical use of this machine the parts are positioned substantially as shown in Figs. 2 and 3, with one or the other of the pawls 36 41 in engagement with the ratchet-bar 32 to retain the cutting-block at the desired position in the plane of its travel on the track. A section of wedge-timber 46 is positioned on the major portion of the cutting-block, with its grain at right angles to the upper face of the member on which it rests, its upper edge approximately flush with the upper face of the thickest portion of the cutting-block and a square end thereof abutting the forward face or the shoulder of the cutting-block which projects above the thinnest portion thereof. It is necessary in order to contact the end of the wedge-timber 46 with the shoulder of the cutting-block that the leaf-spring 47 be elevated, which is accomplished by manually-effected downward movement of the arm 50 of the rock-shaft 49, resulting in an upward movement of the lug 51 into engagement of the lower face of said spring. When the wedge-timber is properly positioned, the spring is permitted to descend into contact therewith and is more firmly seated by slight impaction by a hammer above the serrated end portion thereof, which causes the serration or teeth 48 to enter the block and bind the same rigidly. The pawls 36 41 are disengaged from a ratchet-bar 32, and said bar, the cutting-block, and the wedge-timber carried thereby moved downwardly along the track until but a small portion of the wedge-timber projects beyond the vertical plane of the knife-edge. At this time the adjusting-wheel 28 is so rotated manually as to elevate or descend the adjusting-rod and oscillate the track 18 to the degree found necessary to effect the desired angle between the planes of the track and the knife's travel. The handle 69 of the operating-lever is depressed, resulting in the following movement: The connecting-rod 64 descends, the lever 60 is drawn down thereby, the knife 58 descends into contact with the wedge-timber, (at this time it is desirable to more firmly position the wedge-timber if the adjustment thereof be found to be correct, and such operation is effected through the manipulation of the adjusting-wheel 57 in such a manner as to cause the descent of the sliding plate 52 into contact with the upper face of the wedge-timber,) the knife passes through the wedge-timber, cutting obliquely across the grain thereof until the stop 82 contacts with the top plate 15, at which time the edge of the knife is in contact with the cutting-block, and a section has been severed from the wedge-timber. The first section severed from the wedge-timber is not of value and is removed simply as a preliminary to the production of useful wedges. As the knife 58 descends the projecting portion of the stop 82, which heretofore has carried the rod 45 and its connections through the medium of the nut 83, descends, passes along the rod 45 from the nut 83 into contact with the nut 84, depresses the rod through the medium of the nut 84, oscillates the lever 44, elevates the rod 43, elevates the crank 42 of the bell-crank lever 38, oscillates the bell-crank lever, and thereby moves the fulcrum of the pawl-lever 41 rearwardly past one or more teeth of the ratchet-bar 32, the pawl 36 retaining by engagement with the ratchet-bar the cutting-block. The adjusting-wheel 57 is manipulated to raise the plate 52 slightly out of contact with the wedge-timber. The operating-lever 69 is elevated, thereby elevating the knife 58 through the medium of the rods 64, 60, and 62, the splitting-blades 71 having entered the section cut from the wedge-timber,

elevating said section into contact with the serrated portion 78 of the separator 74, and into contact with the lower end of the stops 73. The separator 74 and the stop 73 being fixed against vertical movement and the knife and splitting-blades thereon continuing to rise, it is apparent that the sections cut from the wedge-timber will be engaged thereby and thrown outwardly. In the further elevation of the knife the projecting portion of the stop 82 engages the nut 83 and elevates the rod 45, reversing the movement of the lever 44, rod 43, crank 42, and bell-crank lever 38, and carrying the pawl 41 forwardly, thereby moving the ratchet-bar and cutting-block forwardly along the track a distance approximately coincident to the distance previously rearwardly traveled by the fulcrum 40 of the lever-pawl 41. The handle of the lever 69 is again depressed, moving the knife and connected members downwardly, as before described, until another section is cut from the wedge-timber on a plane parallel with the plane of the forward end of the wedge-timber as it appeared before the knife descended the successive time and across the grain of said wedge-timber at an oblique angle. It is desired to suggest here that the section just cut and the sections afterward cut from the wedge-timber under consideration are parallelepipedal in form. The knife is then elevated, the parallelepipedon is raised by the knife and splitters, (being held rigidly by reason of the compressions of individual sections between the splitters, the degree of compression being dependent upon the thickness of the said splitters,) the outer upper corner thereof is engaged by the teeth 78 of the separator 74 and pressed outwardly and downwardly, thus splitting off eight sections therefrom, the rear faces of which follow the grain of the wood, and consequently run out near the bottom of the section, forming wedges which fall upon the forward portion of the cutting-block. In the further elevation of the knife the cross-head on the rod 81 is engaged by the bolt 61 to elevate the separator 74 outwardly in order to complete the separation of the wedges from the severed section. The portion of the severed section remaining in contact with the knife and splitting-blades is a chip or waste matter, and is removed in the further elevation of the knife by engagement with the lower ends of the stops 73.

The length of the wedges desired to be cut from a given thickness of wedge-timber is determined by the degree of angle of the track relative to the vertical plane of the knife.

I claim as my invention—

1. A wedge-splitting machine, comprising a traveling timber-support, means for feeding said support and timber, a large knife mounted for vertical reciprocation in the plane of the travel of said support short splitting-blades at right angles to the large knife and secured thereto and a hinged separator depending parallel with the knife and arranged to be swung outwardly thereby for removing the wedges from the face of the knife.

2. The combination of a track arranged for adjustment relative to the horizontal, a cutting-block mounted for travel on said track, means for holding a section of wedge-timber on said cutting-block, a large knife mounted for vertical reciprocation in the path of travel of the cutting-block, short splitting-blades at right angles to the large knife and secured thereto means for reciprocating said knife, adjustable connections between the knife and cutting-block whereby the cutting-block is advanced in the reciprocation of the knife, a hinged separator depending parallel with the large knife and arranged to be swung outwardly thereby to separate the wedges from the severed section and arms 73 arranged in contact with the face of the knife for removing the severed sections from the knife.

3. In a wedge-splitting machine, a cutting-block arranged to receive a section of wedge-timber, a leaf-spring engaging one end of said wedge-timber, a rock-shaft 49 having a lip 51 arranged to engage and lift the said leaf-spring and a slidingly-mounted plate adjustably arranged to engage the opposite end portion of the wedge-timber.

4. In a wedge-splitting machine, a track, a cutting-block arranged for travel on said track, a ratchet-bar on said block, a pawl mounted on the track and engaging said ratchet-bar, a bell-crank lever mounted on said track, a pawl mounted on said bell-crank lever and arranged for travel to and fro beneath the track to engage and move the cutting-block by the ratchet-bar thereon, a connecting-rod joining said bell-crank lever to an oscillating lever, an actuating-rod connected to the opposite end of the oscillating lever, a knife mounted for vertical reciprocation and adjustable connections between said knife and the actuating-rod whereby the travel of the cutting-block is established and determined.

5. In a machine of the class described, vertical guideways, a knife mounted therein and arranged to sever successive sections from a wooden block, splitting-blades at right angles to said knife, a knife-slide, a separator pivoted at its upper end to a stationary support and arranged to engage sections of wood severed and elevated by the said knife, a link connecting said separator and knife-slide, and stop-bars rigidly mounted independent of the knife and arranged to remove chips from the said knife.

6. In a machine of the class described, a vertically-moving knife, splitting-blades above the cutting edge of said knife and at right angles thereto, a separator arranged in close proximity to the path of travel of the knife, and a rod loosely connected with the knife mechanism and hinged to the separator whereby said separator is oscillated near the

end of travel of the upward movement of the knife.

7. In a wedge-splitting machine employed to cut sections from a wooden block obliquely across the grain thereof a knife, cutting-blades above the cutting edge of said knife and at right angles thereto, and a separator intermittently operated to engage and split wedges from the severed sections.

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