

No. 698,006.

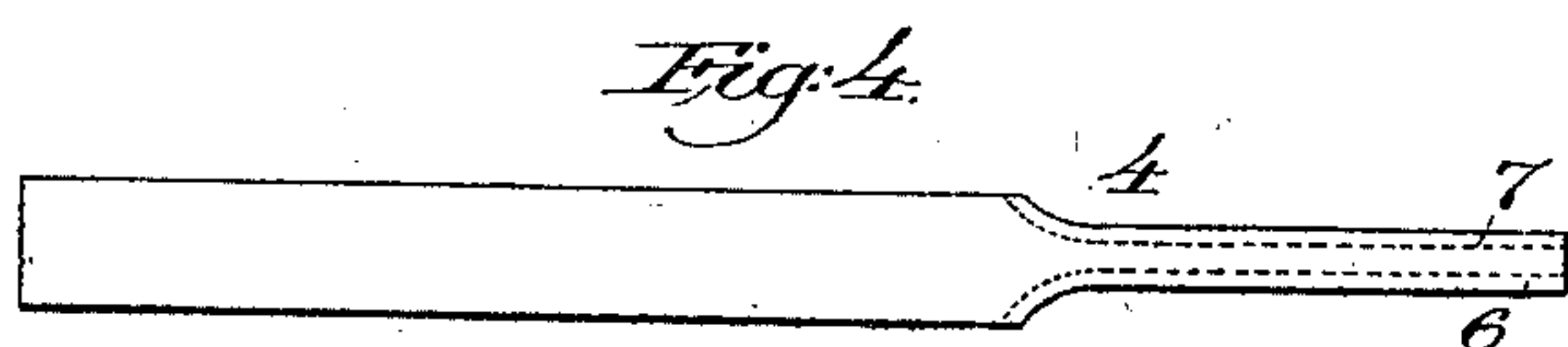
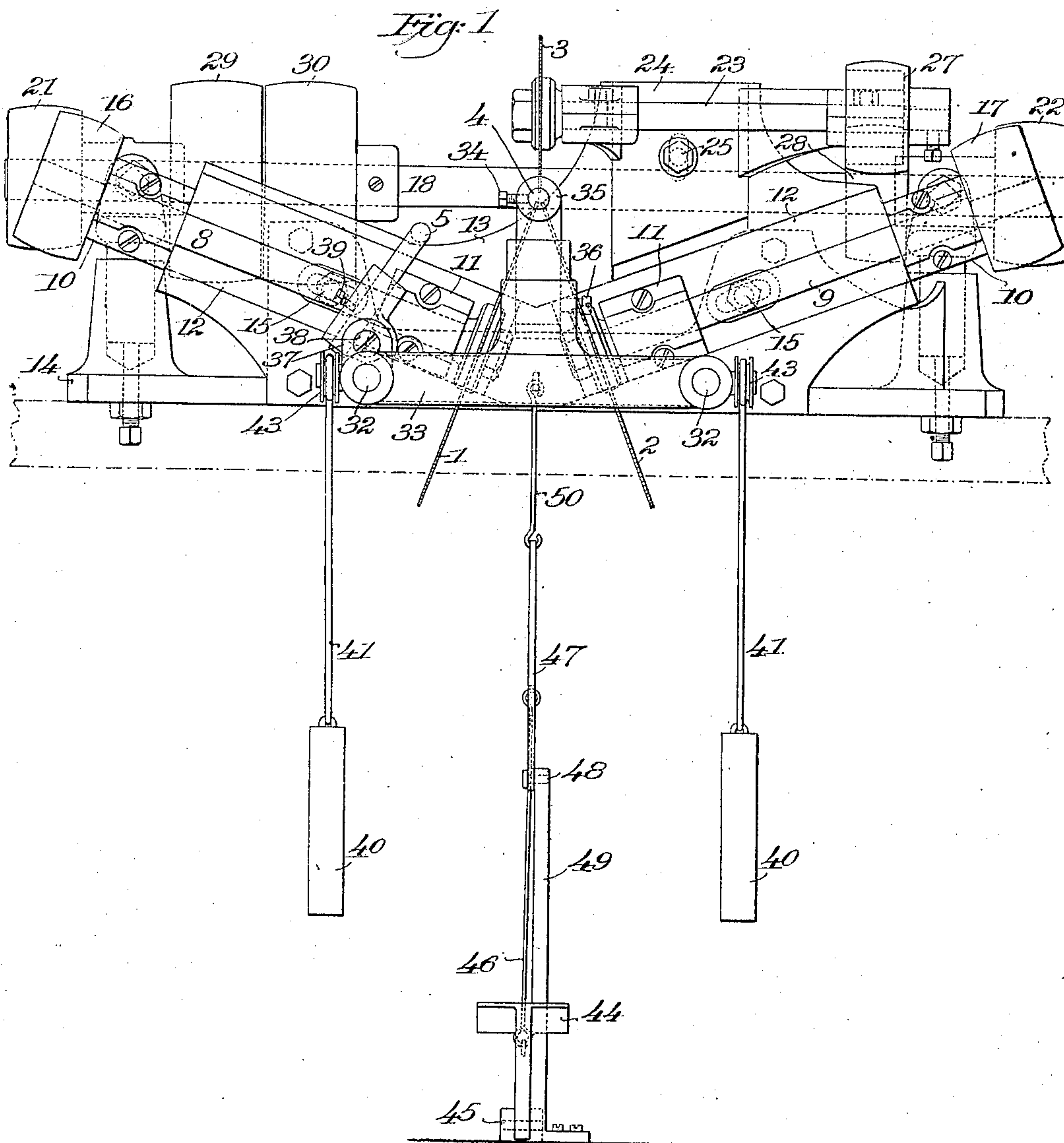
Patented Apr. 22, 1902.

E. W. GERRISH.  
LAST SAWING MACHINE.

(Application filed May 14, 1901.)

(No Model.)

3 Sheets—Sheet 1.



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Inventor:  
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by his Attorney  
Benjamin Phillips

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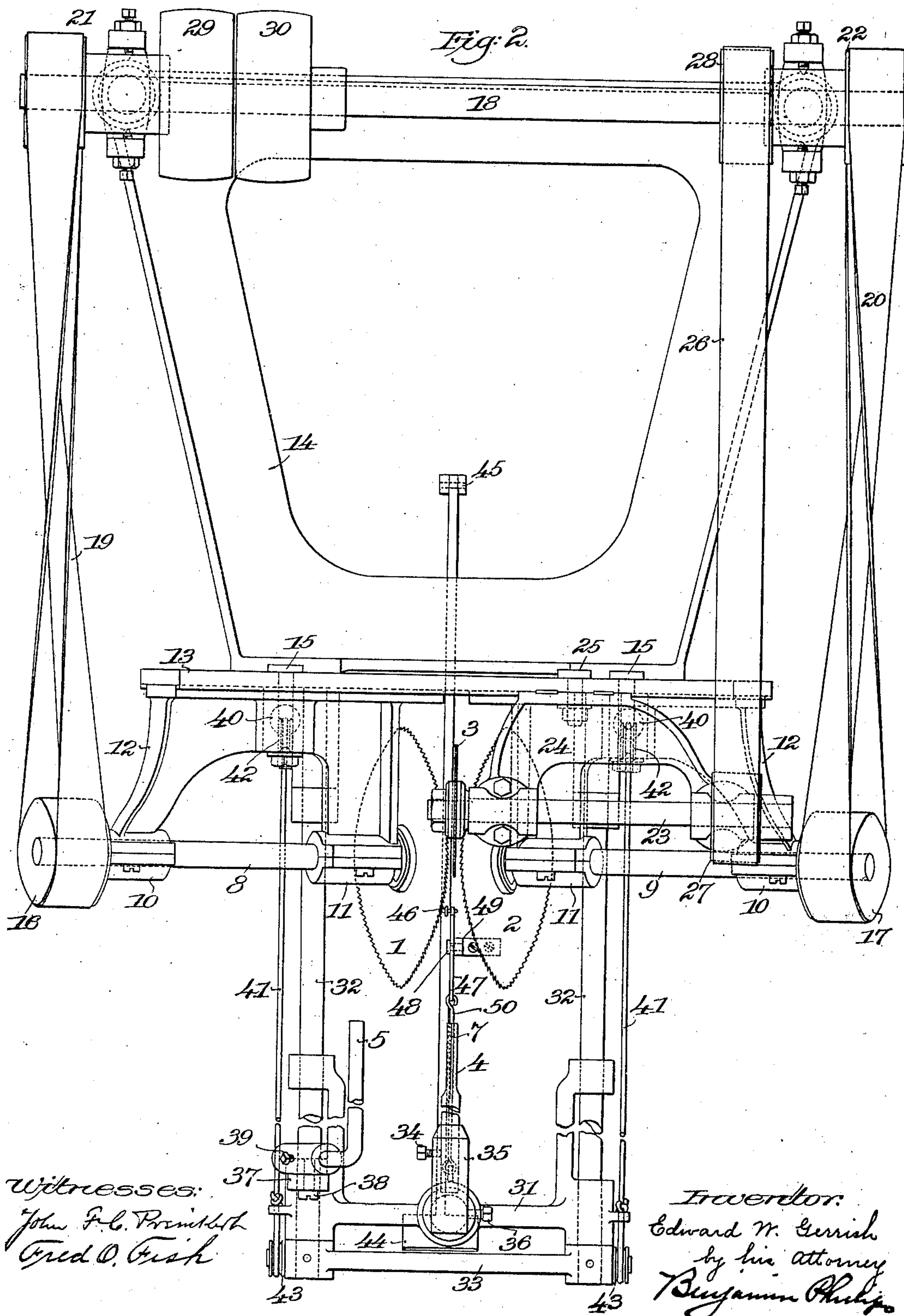
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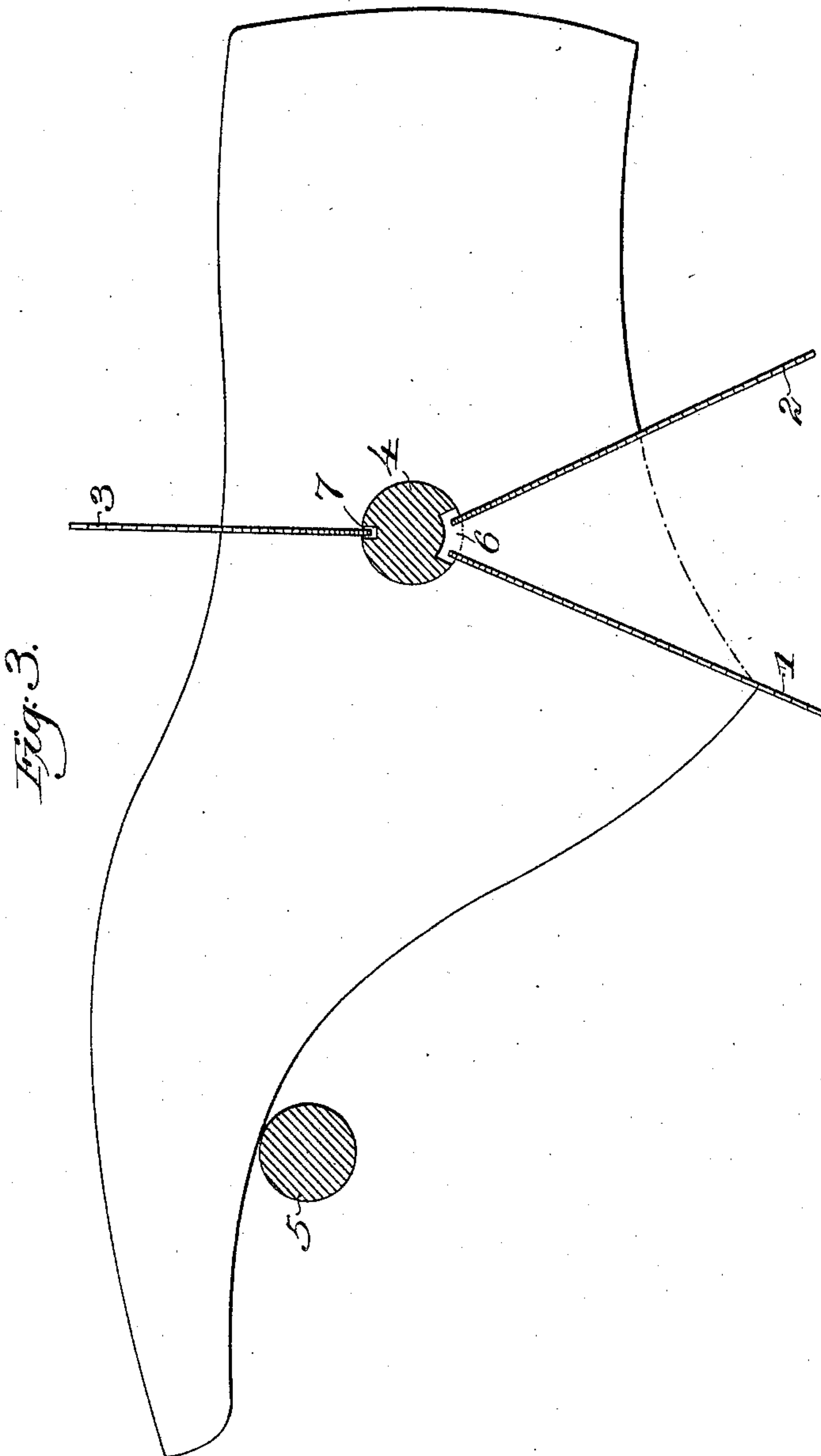
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3 Sheets—Sheet 3.



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# UNITED STATES PATENT OFFICE.

EDWARD W. GERRISH, OF LYNN, MASSACHUSETTS, ASSIGNOR OF ONE-HALF  
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## LAST-SAWING MACHINE.

SPECIFICATION forming part of Letters Patent No. 698,006, dated April 22, 1902.

Application filed May 14, 1901. Serial No. 60,159. (No model.)

*To all whom it may concern:*

Be it known that I, EDWARD W. GERRISH, a citizen of the United States, residing at Lynn, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Last-Sawing Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention; such as will enable others skilled in the art to  
10 which it appertains to make and use the same.

The present invention relates to a last-sawing machine for use in the manufacture of hinged lasts, a type of which is disclosed in Patent No. 646,141, granted to me March 27,  
15 1900. A last of the type referred to consists of a fore part and a heel part hinged together and separated above the hinge by a V-shaped notch in order to allow the heel part to swing on the hinge when the last is inserted in or  
20 removed from a shoe.

The object of my invention is to provide a last-sawing machine by which a V-shaped block may be removed from an integral last to form a V-shaped notch above the hinge  
25 and by which the heel part of the last may be separated from the fore part; and with this object in view my invention consists in a last-sawing machine provided with a last-support, two saws arranged to saw a V-shaped  
30 block from a last, and a saw arranged to co-operate with said saws to separate the heel part from the fore part of the last, said last-support and saws being relatively movable to bring the last and saws into engagement  
35 and the planes in which said saws are located being parallel to the line of such movement.

My invention also consists in the devices and combinations of devices hereinafter described and claimed, the advantages of which will be  
40 obvious to those skilled in the art from the following description.

A preferred form of my invention is illustrated in the accompanying drawings, in which—

45 Figure 1 is a view in front elevation of a last-sawing machine embodying the same. Fig. 2 is a plan view of the machine shown in Fig. 1. Fig. 3 is a view in side elevation of the last, the means for supporting the  
50 same, and a portion of the saws, illustrating the action of the saws in removing the V-

shaped block from the last and in separating the heel part from the fore part of the last. Fig. 4 is a view in side elevation of a last-supporting mandrel, to be hereinafter de-  
55 scribed; and Fig. 5 is an end view thereof.

A machine embodying my invention is provided with three saws, two of which are arranged at an angle to each other to saw a V-shaped block from a last and the other of  
60 which is arranged at an angle to one or both of said saws and extends outside of such angle, so as to complete the separation of the heel part from the fore part of the last, such separation being partially accomplished by the  
65 removal of the V-shaped block. The planes in which the three saws are located all extend in the direction of the relative movement imparted to the last and saws in bringing the last and saws into engagement, and  
70 this arrangement of the saws may be conveniently defined by saying that they are located in planes which are parallel to a given right line. In the machine illustrated in the drawings these saws are indicated at 1, 2,  
75 and 3 and are arranged in intersecting planes, so that the planes of the cuts made in the last by the saws intersect at the axis of the hinge of the completed last. Suitable means  
80 are provided for driving the saws, as will be hereinafter described, and also means for adjusting the saws to allow different-sized saws to be used in the machine or to maintain the proper relative position of the saws as they  
85 are worn away in sharpening.

In order that the last may be properly presented to the saws, a feature of my invention contemplates providing a suitable support for the last and in providing means whereby a relative movement may be imparted to the  
90 last-support and saws to bring the last and saws into engagement. The type of last for the manufacture of which the machine illustrated in the drawings is particularly designed is provided with a hole to receive the  
95 parts of the hinge, and this hole is conveniently bored in the last before the heel part is separated from the fore part. The last-support of the machine shown in the drawings comprises a mandrel 4, which enters the  
100 hole bored in the last for the hinge and a toe-support 5. The mandrel 4 is so located in



the machine that its axis is in line with the line formed by the intersection of the planes in which the saws 1, 2, and 3 are located. The last is thus properly positioned with relation to the saws by the mandrel. To insure the removal of the V-shaped block and the separation of the heel part from the fore part of the last, the mandrel 4 is provided with grooves 6 and 7, into which the teeth of the saws 1, 2, and 3 project, as is clearly shown in Fig. 3. In the machine shown in the drawings the relative movement of the last and saws to bring the last and saws into engagement is obtained by mounting the mandrel 4 upon a carriage movable toward and from the saws, as will be hereinafter described. The mandrel 4 is also adjustable to maintain the proper relation of the mandrel to the saws when the saws are adjusted.

Referring now to Figs. 1 and 2, it will be seen that the saws 1 and 2 are secured by suitable clamping-bolts and washers to the inner ends of shafts 8 and 9, arranged at an angle to each other. Each shaft is supported in bearings 10 and 11 on a carriage 12, mounted to slide in a guideway formed in the vertical plate 13 of a frame 14 and held in adjusted position by means of a bolt 15 passing through a slot in the carriage 12 and a hole in the plate 13. The above-described arrangement is such that the carriages 12 can be moved to adjust the shafts 8 and 9 longitudinally and thereafter locked in adjusted position by means of the bolts 15. By so adjusting the shafts the saws can be set at the desired distance apart and the proper relative position of the saws maintained when the saws become worn in sharpening. The shafts 8 and 9 are provided at their outer ends with pulleys 16 and 17 and are driven from the main driving-shaft 18, journaled in the rear portion of frame 14, by means of belts 19 and 20, which pass over the pulleys 16 and 17 and pulleys 21 and 22, secured to the driving-shaft 18.

The saw 3 is secured by a suitable clamping-bolt and washer to the inner end of a horizontal shaft 23, journaled in bearings carried by a vertically-adjustable carriage 24, mounted in suitable guideways in the vertical plate 13. The carriage 24 is held in adjusted position by means of a bolt 25 passing through a hole in the carriage and a slot in the plate 13. By the construction above described the saw 3 can be adjusted transversely to its axis of rotation to bring the saw into proper position with relation to the saws 1 and 2. The shaft 23 is driven from the driving-shaft 18 by means of a belt 26, passing over a pulley 27 on shaft 23 and a pulley 28 on shaft 18. The frame 14 is secured by any suitable means to a bench, as shown in dotted lines in Fig. 1, or other suitable support, and the shaft 18 is provided with suitable fast and loose pulleys 29 and 30.

From an inspection of Fig. 2 it will be seen that the saw 3 is located at the rear of saws

1 and 2, by which arrangement the saws 1 and 2 pass completely through the last before the saw 3 has severed the heel part from the fore part of the last. By this arrangement the V-shaped block is removed from the last, and thereafter the last is supported by the mandrel, as will be hereinafter described, until the heel part is separated from the fore part by the saw 3. This arrangement also renders the machine easier of operation.

The mandrel 4 and toe-support 5 are secured to a carriage 31, mounted to reciprocate upon guide-rods 32, extending forward horizontally from the vertical plate 13 of frame 14, the rods being tied together at their forward ends by means of a cross-piece 33. The mandrel 4 is secured by means of a set-screw 34 to the upper end of a standard 35, which is vertically adjustable in a socket in the carriage 31 and is held in adjusted position by means of a set-screw 36. By raising or lowering the standard 35 the mandrel 4 can be adjusted to bring it into proper position with relation to the saws 1, 2, and 3. The toe-support 5 (see more particularly Fig. 2) consists of a rod bent at right angles, the lower end of which is received in a socket secured to lug 37 of carriage 31 by means of a screw 38, the construction being such that by loosening the screw 38 the socket can be rotated about the screw as a pivot and locked in any desired position. A vertical adjustment of the rod 5 is provided for by means of a set-screw 39, which holds the rod in the socket. By the adjustment above described the toe-support 5 can be adjusted to bring the last into proper position to be acted upon by the saws.

The carriage 31 is normally held in retracted position, as shown in Fig. 2, by means of weights 40, which are connected to the carriage 31 by means of cords 41, passing over pulleys 42, journaled on the vertical plate 13 of the frame, and pulleys 43, journaled at the ends of cross-piece 33. To bring the last in engagement with the saws, the carriage 31 is moved toward the saws by means of a foot-treadle 44, pivoted at 45 to the floor of the shop or other stationary support. The treadle is connected by means of a link 46 to the short arm of a bell-crank lever 47, pivoted at 48 to a standard 49, the long arm of the bell-crank lever 47 being connected by means of a link 50 to the carriage 31.

The operation of the machine above described has been sufficiently indicated in connection with the description of its construction, and further description thereof is deemed unnecessary.

Having thus indicated the nature and scope of my invention and having explained the construction and mode of operation of the preferred embodiment thereof, I claim as new, and desire to secure by Letters Patent—

1. A last-sawing machine, having, in combination, a last-support, two saws arranged at an angle to each other to saw a V-shaped



block from the last and a saw arranged at an angle to one of said saws and extending outside of such angle to cooperate with said saws to separate the heel part from the fore part of the last, said last-support and saws being relatively movable to bring the last and saws into engagement, and the planes in which said saws are located being parallel to the line of such movement, substantially as described.

2. A last-sawing machine, having, in combination, a last-support, two saws arranged at an angle to each other to saw a V-shaped block from a last, and a saw located at the rear of said saws arranged at an angle to one of said saws and extending outside of such angle to cooperate with said saws to separate the heel part from the fore part of the last, said last-support and saws being relatively movable to bring the last and saws into engagement and the planes in which said saws are located being parallel to the line of such movement, substantially as described.

3. A last-sawing machine, having, in combination, two saws arranged at an angle to each other to saw a V-shaped block from a last, a saw arranged at an angle to one of said saws and extending outside of such angle to cooperate with said saws to separate the heel part from the fore part of the last and a last-supporting mandrel provided with grooves to receive the saws, said saws and mandrel being relatively movable to bring the last and saws into engagement, and the planes in which said saws are located being parallel to the line of such movement, substantially as described.

4. A last-sawing machine, having, in combination, two saws arranged at an angle to each other to saw a V-shaped block from a last, a saw arranged at an angle to one of said saws and extending outside of such angle to cooperate

with said saws to separate the heel part from the fore part of the last, a last-supporting mandrel provided with grooves to receive the saws, said saws and mandrel being relatively movable to bring the last and saws into engagement, and the planes in which said saws are located being parallel to the line of such movement, and adjusting means for bringing the saws and mandrel into proper relative position, substantially as described.

5. A last-sawing machine, having, in combination, two saws arranged at an angle to each other to saw a V-shaped block from a last, means for adjusting said saws longitudinally of their axes, a saw arranged at an angle to one of said saws and extending outside of such angle to cooperate with said saws to separate the heel part from the fore part of the last, means for adjusting said saw transversely to its axis, a last-supporting mandrel provided with grooves to receive the saws, said saws and mandrel being relatively movable to bring the last and saws into engagement, and the planes in which said saws are located being parallel to the line of such movement, and means for adjusting said mandrel transversely to its axis, substantially as described.

6. A last-sawing machine, having, in combination, a last-support, two saws arranged at an angle to each other and a saw arranged outside and in a plane intersecting such angle, said support and saws being relatively movable past each other and the planes of the latter intersecting in the line of such movement, substantially as described.

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

EDWARD W. GERRISH.

Witnesses:

WILLIAM O'SHEA,  
MICHAEL F. PHELAN.