

No. 626,531.

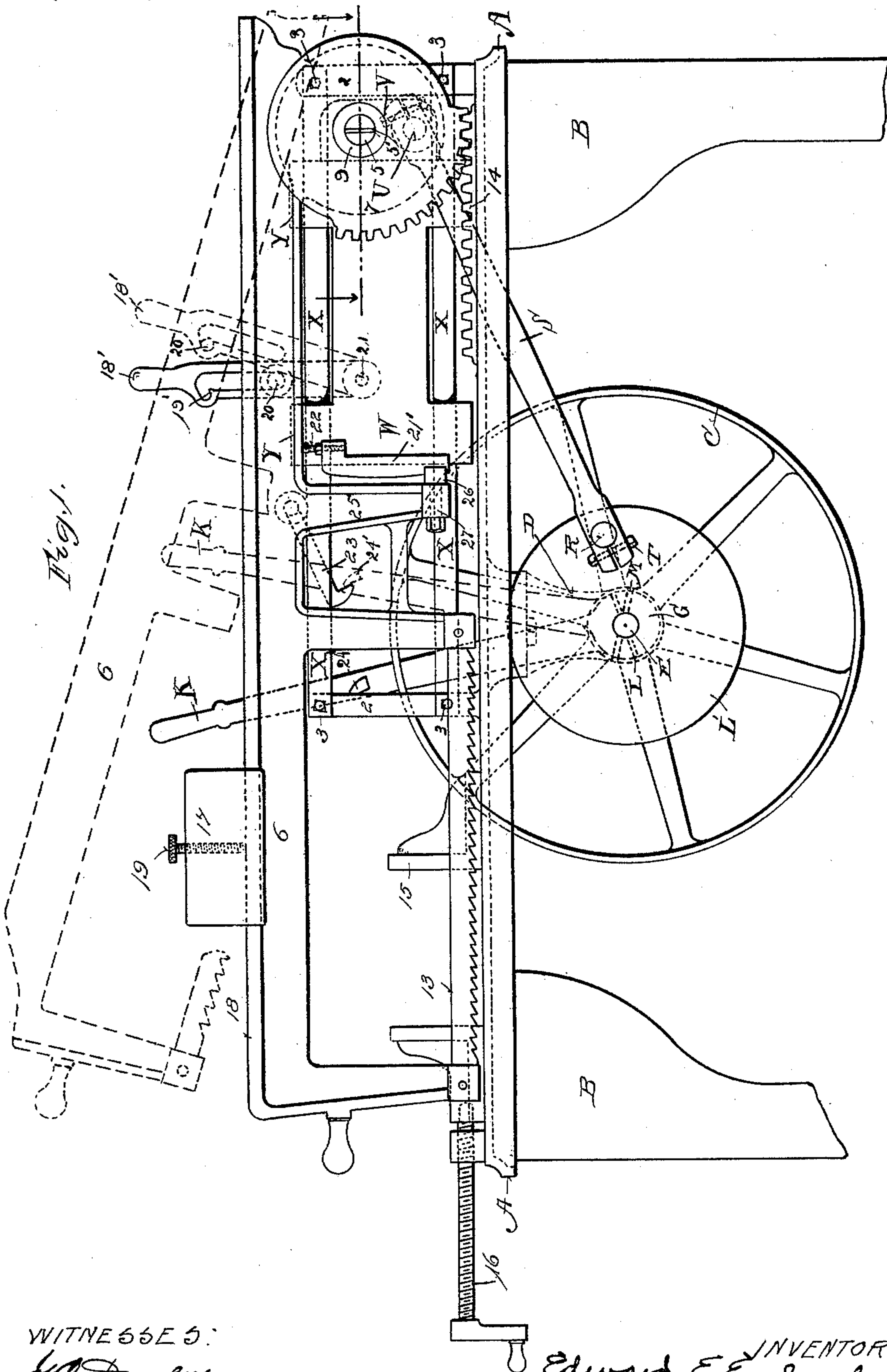
Patented June 6, 1899.

E. E. EUCHENHOFER.
HACKSAW.

(Application filed Apr. 3, 1899.)

(No Model.)

2 Sheets—Sheet 1.



WITNESSES:
J. C. Hawley.
H. M. Hawley.

INVENTOR,
Edward E. Eichenhofer,
By H. A. Goulmin.
his ATTORNEY.

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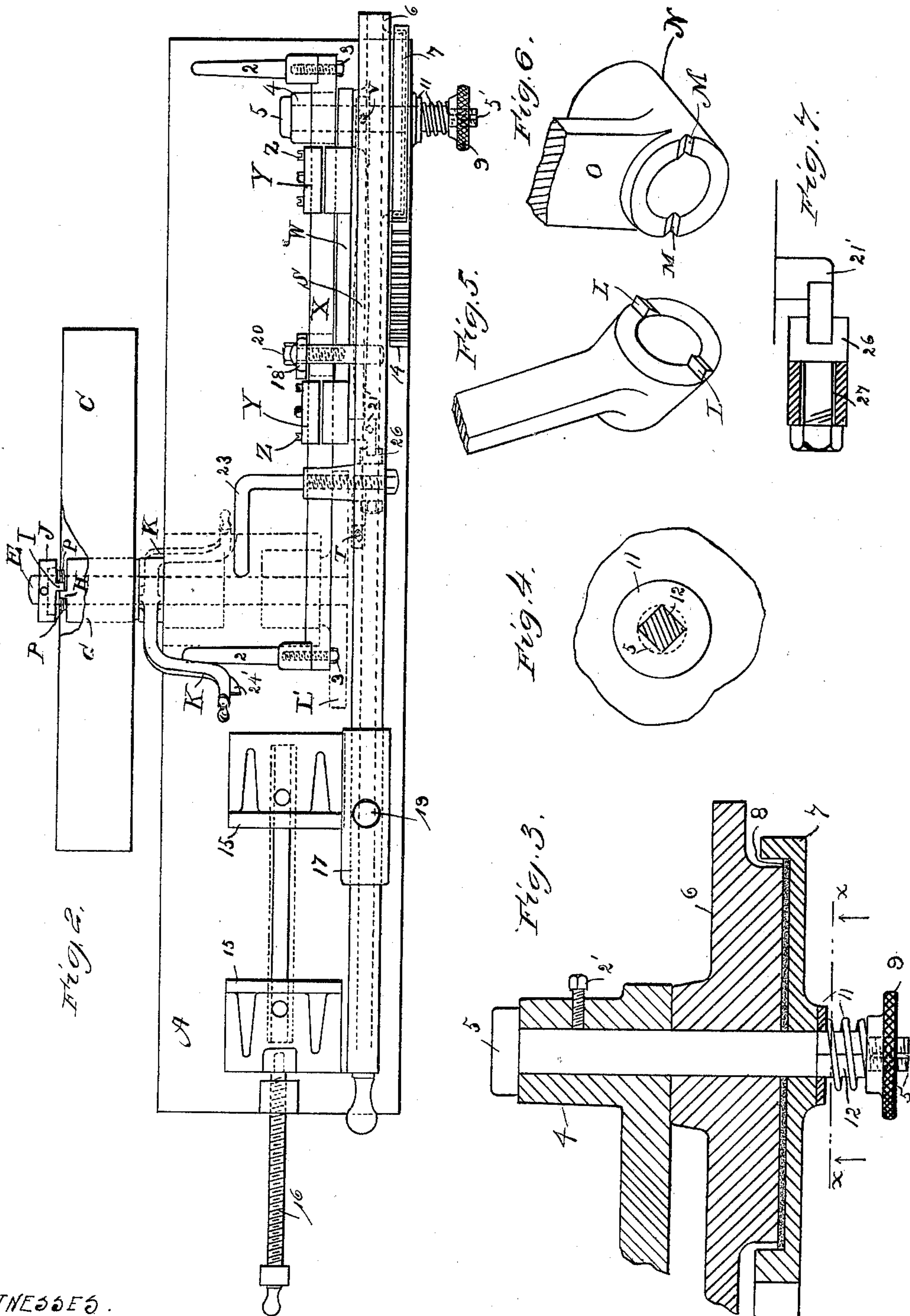
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WITNESSES.
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UNITED STATES PATENT OFFICE.

EDWARD E. EUCHENHOFER, OF DAYTON, OHIO.

HACKSAW.

SPECIFICATION forming part of Letters Patent No. 626,531, dated June 6, 1899.

Application filed April 3, 1899. Serial No. 711,470. (No model.)

To all whom it may concern:

Be it known that I, EDWARD E. EUCHENHOFER, a citizen of the United States, residing at Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Hacksaws, of which the following is a specification, reference being had therein to the accompanying drawings.

10 This invention relates to certain new and useful improvements in hacksaws for sawing metal, &c.

15 The object of this invention is to provide means for forcing the hacksaw into the metal when the saw is making its cutting stroke and to raise such saw from engagement with the metal on its return stroke.

20 My invention also relates to improved means for automatically stopping the movement of the saw when the metal being operated upon has been sawed in two.

My invention further relates to a reciprocating saw-carriage and a combined pivoted saw-frame.

25 My invention also relates to details of construction hereinafter appearing, and particularly pointed out in the claims.

30 In the accompanying drawings, on which like reference letters and numerals indicate corresponding parts, Figure 1 is a side elevation of my improved hacksaw complete; Fig. 2, a plan view of the same; Fig. 3, a detail partial sectional view showing the manner in which the saw-frame is connected with the saw-carriage, together with the frictional clutch for operating the saw-carriage; Fig. 4, a partial detail sectional view on the line *xx* of Fig. 3, looking in the direction of the arrows; Fig. 5, a partial detail perspective view of the operating-lever for throwing the machine into and out of gear; Fig. 6, a partial perspective view of the bearing-brackets and bearing for the main driving-shaft, and Fig. 7 a detail view of the guide and guide-bolt to prevent the saw-frame from having side movement.

45 Heretofore in machines of this class it has been very difficult to obtain a perfectly smooth cut in the iron and also to prevent the saw from dragging as it made its return stroke. With my invention I have provided means for causing the saw-teeth to be forced

into engagement with the iron being operated upon, and at the same time the same means will cause the saw to be disengaged from such iron on the back or non-cutting stroke. 55

The letter A represents a suitable base mounted upon legs B. This base carries a driving-wheel C, mounted in suitable bearings D upon a shaft E. It will be seen that the hub G has a lug or extension H from its outer face, which at certain times is adapted to engage with a lug I, extending from a collar J, fixed upon the shaft E. In order to cause the lugs I and J to engage with each other, I provide a lever K, which is mounted upon the shaft E and has projecting from its inner side lugs or projections L, which force the driving-wheel outwardly on its shaft for such purpose. This will cause the driving-shaft to rotate. In order to again release the driving-wheel from the shaft, it will be observed from Fig. 2 that I have provided a spring P, which is interposed between the collar J and the hub of the driving-wheel, so that it will normally tend to press the driving-wheel inward; but this can only be done when the driving-wheel is in its rear or dotted position, so that the lugs L may engage with the notches M in the outer face of the bearing N, formed on the lower end of the bracket O, for the driving-shaft E. Upon the inner end of this shaft is mounted a disk L', which carries a crank-pin R, having pivoted thereon one end of a pitman S. The other end of said pitman is pivoted upon a stud or pin U, carried by the saw-carriage W, mounted upon the guide-rods X, one of which stands vertically above the other. In order to take up the wear in the pitman-bearings, I provide bolts T and V, which bind the respective slotted ends of said pitman as snugly as desired upon the crank-pin and carriage-stud. 80 85 90

In order to slidably mount the saw-carriage upon the guide-rods, I employ adjustable caps Y, which are adapted to be connected with said carriage by means of screws Z in such a manner that they, together with the carriage, form bearings which freely slide upon said guide-rods. The rods X are screwed to brackets 2, projecting upward from the base A, by means of screws 3. 95 100

Near the rear end the saw-carriage is provided with a boss or extension 4 in the nature

of a hub. Through this boss or extension passes a bolt 5, upon which, adjacent to the saw-carriage, is pivotally mounted a saw-frame 6 and a friction toothed segment 7, while between the saw-frame and toothed segment is mounted a packing 8, composed of leather or other suitable material. In order to bind the friction-segment against the saw-frame, I provide a chased hand-nut 9, which screws upon the outer end of the bolt 5 and has mounted between it and the segment-clutch 7 a spring and washer 11, the latter having an angular opening adapted to fit upon the angular-shaped portion 12 of the bolt 5. This spring is for the purpose of permitting more or less yielding contact between the clutch or toothed segment, and the boss on said saw-frame, while the washer prevents the unscrewing action on the hand-nut by reason of the relative movement between the saw-frame and clutch or toothed segment, as will hereinafter appear. It will be seen that the outer end of said bolt is also slotted, as shown at 5'. This is for the purpose of giving a spring-like effect on the hand-nut 9 at all times, so that it will assist in preventing the hand-nut from unscrewing. The outer end of the saw-frame supports a saw 13, mounted in the ordinary or any suitable manner. It will be observed that the saw-teeth all slant in one direction, which is for the purpose of permitting them to saw when the frame is moved in the direction of their slant only. In sawing metal some is much softer than others, and the harder the metal the more pressure is required, so that the teeth will cut faster. Heretofore this has been accomplished by employing a heavy weight; but where such weights were used they operated to hold the saw in engagement with the metal when the saw-frame was making its return stroke, which acts to dull the saw very quickly, as the points were being constantly ground off on such return stroke. It has been my aim to overcome this difficulty and to do away with excessively heavy weights and at the same time to provide proper mechanism for causing the saw to be forced into engagement on the outstroke and raised from engagement on the instroke. This I have accomplished by means of my friction-clutch. By means of the hand-nut 9 the toothed segment 7 may be screwed up against the packing 8 and the saw-frame 6 as lightly or as snugly as desired. As the toothed segment travels forward in engagement with the rack 14 in a manner presently to appear, there will be relative movement, of course, between the saw-frame and the toothed segment; but since the toothed segment is frictionally clutched thereto it will cause the saw-frame to pivot about its pivotal connection with the saw-carriage, thereby descending at its outer end. This will of course cause the saw to be forced into engagement with the metal, and the tighter the friction between the toothed segment and the saw-frame the harder such en-

gagement with the metal. As the carriage makes its return stroke the toothed segment 7 will raise the end of the saw-frame from cutting or rubbing contact with the metal being operated upon, such metal being held by a vise 15, which is made adjustable by means of the screw 16, so that it will accommodate various sizes of metal as desired.

I have referred to the saw-carriage, together with the saw-frame, as traveling back and forth. This is accomplished by means of the pitman being connected with the carriage W and to the crank-pin R, so that as the crank-disk L' is rotated the saw-carriage will be moved backward and forward in its ways or guides X.

In order to assist the saw-frame in holding the saw into cutting contact with the metal, I provide a sliding weight 17, which is mounted on a track 18, extending the full length of the saw-frame. This weight may be moved in or out on its track, according to the degree of pressure desired, and is held in such position by a set-screw 19, adapted to screw down upon the track. The hand-nut 9 may also be manipulated to cause a tighter gripping of the clutch members, which will cause the saw to be forced into the metal much harder than where the hand-nut is operated to bind the clutch members together but slightly. However, it will be understood that the weight and the friction-clutch are operated in conjunction with each other—that is, when the weight is slid outward more pressure or tension will necessarily be applied to the clutch members and when the weight is slid inward less pressure. In this manner the weight and clutch members are made to work in harmony, so that as the weight is thrown forward on the saw-frame the tension of the clutch must be correspondingly greater in order to prevent the dragging of the saw on the return stroke, while when the weight is thrown backward on the saw-frame the tension of the clutch members may be lessened accordingly.

In order to hold the saw-frame thrown back to more readily permit of placing the metal to be operated upon within the vise, I provide a slotted lever 18', which has a notch 19' at its upper end, into which extends a screw 20. This screw is adapted to be carried by the saw-frame, while the lever itself is supported upon a projection 21, extending from the saw-carriage. As the saw-frame is raised to the position indicated in dotted lines in Fig. 1 the stud-screw 20 engages with the notch 19', and thereby holds the saw-frame in its elevated position. When it is desired to operate the machine, the slotted lever 18' is thrown to the position indicated in full lines in Fig. 1, in which position the saw-frame is permitted to drop into contact with the metal to be operated upon.

I will now refer to the means for automatically stopping the operation of the machine when it has entirely severed the metal it is operating upon.

It will be seen that from the side of the saw-carriage extends a bracket 21'. In the upper end of the bracket is carried a set-screw 22. Upon the top of the set-screw rests the saw-frame when in its lower position. In this position the hook 23 will engage with the lug 24', projecting from the lever K. Thus as the saw-carriage is again moved to its rearmost position the lever K is partially rotated, which will cause the teeth L to match with the notches M on the bearing N, so that the spring may force the driving-wheel along on the shaft E until the tooth or projection H disengages with the tooth or projection I on the collar J, whereby the driving-pulley is disconnected from the main driving-shaft, thus stopping the operation of the machine. It will be understood, of course, that until the saw-frame comes in contact with the set-screw 22 the hook 23 will not be sufficiently close to the lug 24' to engage therewith. Consequently the machine will continue to operate as long as there is any metal to be sawed, as the saw-frame will not rest upon the set-screw until after the metal is severed.

Referring now to the means for holding the saw-frame from undue vibrations at its outer end, it will be seen that the bracket 25, forming a portion of the saw-frame, carries a slotted bolt 26, which is mounted in a slightly-elongated hole 27 in said bracket. This slotted bolt engages with one edge of the bracket 21' and the elongated hole 27 permits of slightly adjusting the bolt so that there will be no binding between it and the bracket. In this manner the saw-frame is prevented from laterally vibrating because of its connection with the bracket 21' so far in advance of its pivotal connection with the saw-carriage. Thus the saw will run perfectly true through the metal and will make a smooth and even cut.

Referring to Fig. 3, it will be seen that the bolt 5 is held from turning in the saw-carriage by reason of a set-screw 2', which is screwed into the hub 4 and against the bolt.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a hacksaw, the combination with a base, of a reciprocating saw-carriage mounted thereon, a saw-frame pivotally connected with said saw-carriage, means for throwing said saw-frame downward at its forward end when traveling in one direction and upward when traveling in the opposite direction.

2. In a hacksaw, the combination with a base, of a reciprocating carriage mounted thereon, a saw-frame carrying a saw pivotally connected with said carriage, a friction-clutch adapted to engage with said carriage and with said saw-frame, and means for reciprocating said carriage and operating said clutch members relatively to each other.

3. In a hacksaw, the combination with a base, of a saw-carriage slidably mounted thereon, a saw-frame pivotally connected at

one end with said carriage and carrying at its other end a saw, a toothed segment also mounted on said pivot and adapted to frictionally contact with said saw-frame, a rack carried by said base and adapted to be engaged by said toothed segment, means for rolling said toothed segment backward and forward on said rack and also for reciprocating said carriage, whereby the saw is forced into cutting engagement as the toothed segment rolls in one direction, and out of such cutting engagement when such segment rolls in the opposite direction, substantially as shown and described.

4. In a hacksaw, the combination with a base, of a main driving-shaft carried by said base, a driving-wheel loosely mounted upon said shaft and a crank-disk fixedly mounted thereon, a slidable saw-carriage mounted upon said base, a pitman pivoted at one end to said saw-carriage and at its other end to said crank-disk, a saw-frame also pivoted to said carriage and carrying at its outer end a saw, a rack mounted on said base, a toothed segment engaging with said rack, and adjustable friction contact between said toothed segment and said saw-frame whereby when the toothed segment is rolled forward on said rack the segment will act to throw the forward end of said frame downward so that said saw will more readily engage with the metal to be operated upon, and on its return stroke will throw said saw out of engagement with the metal operated upon, substantially as shown and described.

5. In a hacksaw, the combination with a base, supporting a main driving-shaft, a driving-pulley loosely mounted thereon, and carrying a tooth or projection extending from its hub, a cap also having a matching tooth or projection fixedly mounted on said shaft, said lugs adapted to engage with each other, whereby said shaft is rotated, a crank-disk carrying a crank-pin fixedly mounted on the inner end of said shaft, a sliding saw-carriage mounted in ways or guides carried by said bed, a saw-frame pivotally connected, at one end, with said carriage, and carrying a saw at its other end, a toothed segment rotatably mounted, a rack secured to said base with which the segment engages, means for frictionally connecting said segment with said saw-frame, and a pitman for connecting said saw-carriage and said disk crank-pin together, whereby when the main driving-shaft is operated the saw-carriage will reciprocate and the toothed segment will have relative movement to said saw-frame, both in a forward direction and in a backward direction, substantially as shown and described.

6. In a hacksaw, the combination with a base, of a saw-carriage reciprocatingly mounted thereon, a saw-frame pivotally connected with said carriage, a friction-clutch engaging with said saw-frame and with the base of said machine, and means to reciprocate said saw-carriage to partially rotate one member

of said friction-clutch whereby there will be relative movement between said member of the clutch and said saw-frame, substantially as shown and described.

5 7. In a hacksaw, the combination with a base, having a saw-carriage reciprocatingly mounted thereon, of a saw-frame pivotally connected with said carriage, a toothed segment rotatably mounted upon said pivot and
10 adapted to engage with the base of said machine, a frictional surface between said saw-frame and said toothed segment, a hand-nut adapted to press said toothed segment, frictional surface and saw-frame into close con-
15 tact with each other; and a washer and spring interposed between said toothed segment and said hand-nut, and means to prevent said washer from rotating, and other means for reciprocating said carriage, substantially as
20 shown and described.

8. In a hacksaw, the combination with a base having a reciprocating carriage mounted thereon, of a saw-frame pivoted to said carriage, a slotted lever also pivoted to said carriage and having a notch in said slot, a stud
25 or pin projecting from said saw-frame and adapted to extend within the slot in said lever and to engage said notch when the saw-frame is in its raised position.

30 9. In a hacksaw, the combination with a base having a reciprocating carriage mounted thereon, of a saw-frame pivotally connected to said carriage, a hook carried by said saw-frame, means for throwing said machine out
35 of operation, such means adapted to be engaged by said hook and to automatically stop the machine when said saw-carriage is in the proper position to permit of such engagement, substantially as shown and described.

10. In a hacksaw, the combination with a 40 base carrying a main driving-shaft and having mounted thereon a reciprocating carriage, a pulley outwardly shiftable on said shaft, means for engaging said driving-pulley when in its outer limit to drive said shaft, a lever 45 adapted to be operated in one direction to throw said pulley to its outer position, and a spring adapted to shift said pulley out of driving contact with said shaft, a saw-frame pivotally connected with said carriage and 50 carrying a hook adapted to engage with said lever to throw it in the opposite direction when the saw-frame is in its lowermost position, whereby the spring will shift the driving-pulley out of driving contact with said 55 shaft.

11. In a hacksaw, the combination with a base, of a reciprocating saw-carriage mounted thereon, a bracket extending from said carriage and carrying a set-screw, a saw-frame 60 pivoted to said carriage and adapted to be limited in its downward movement by said set-screw, substantially as shown and described.

12. In a hacksaw, the combination with a 65 base carrying a reciprocating and pivotally-mounted saw-frame, of a track or slide formed upon the upper edge of said frame, a weight adapted to slide on said track and a set-screw for securing said weight in any desired po- 70 sition upon said track, substantially as shown and described.

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

EDWARD E. EUCHENHOFER.

Witnesses:

PAUL J. WORTMAN,
E. J. FINKE.