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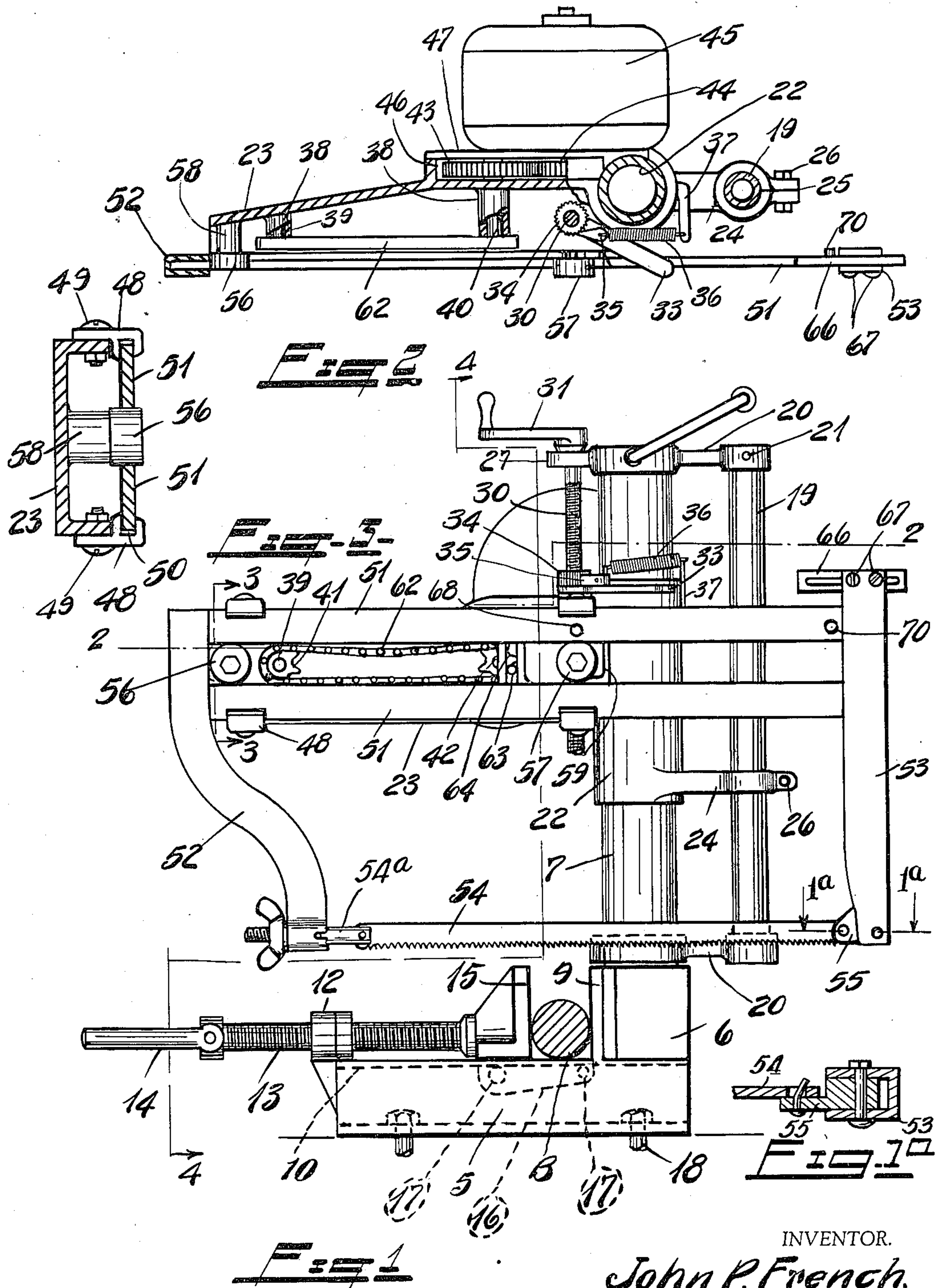
J. P. FRENCH

**2,011,623**

MOTOR DRIVEN HACK SAW

Filed April 30, 1932

2 Sheets-Sheet 1



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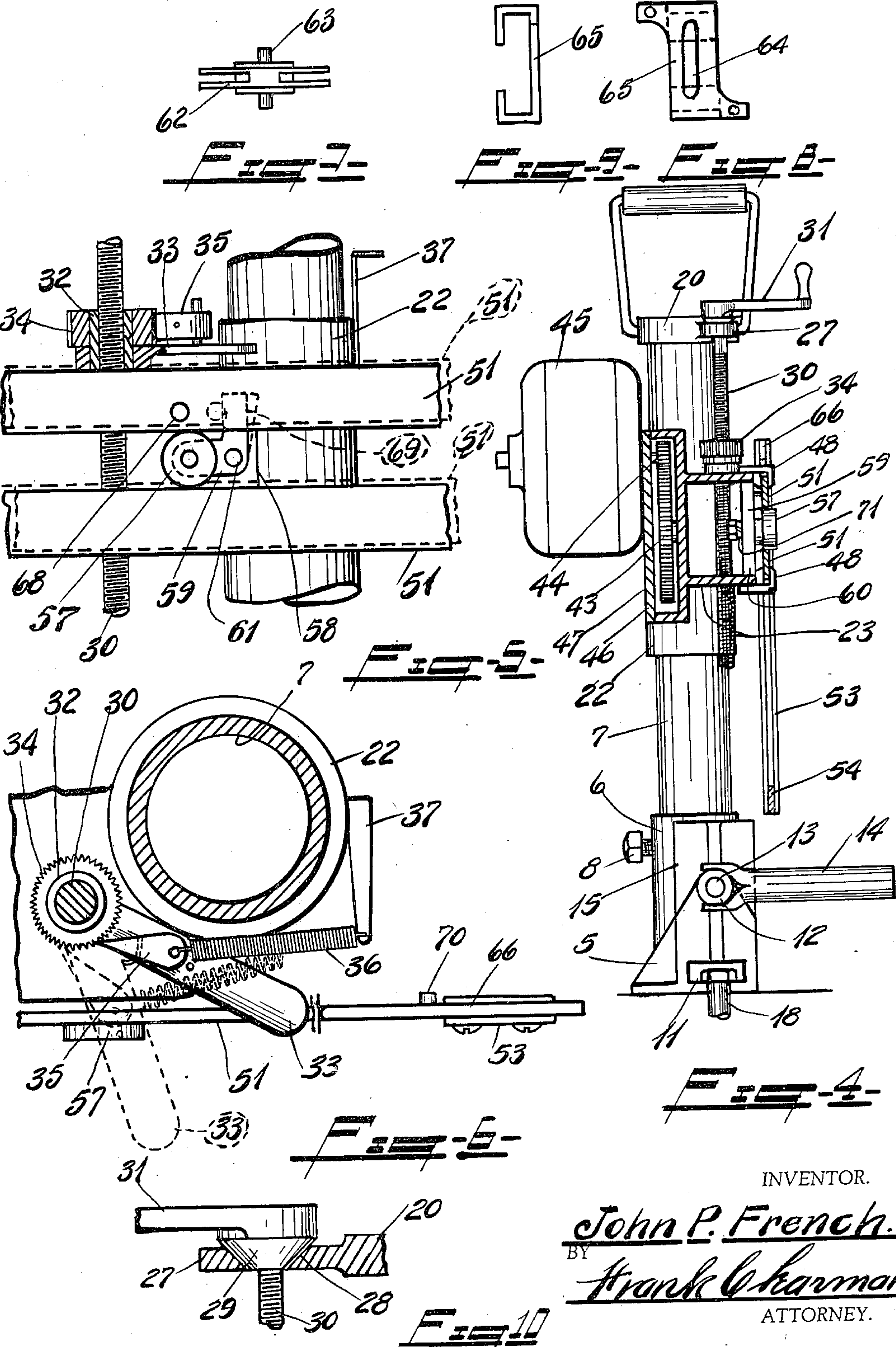
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MOTOR DRIVEN HACK SAW

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2 Sheets-Sheet 2



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## UNITED STATES PATENT OFFICE

2,011,623

## MOTOR DRIVEN HACK SAW

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to Frank E. French, Jr., Alma, Mich.; Frank O.  
Parker administrator of said John P. French,  
deceased

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6 Claims. (Cl. 29—73)

The object of the invention, generally stated, is to provide a hack saw construction having an improved holder which permits a slight yielding of the saw blade in a direction opposite to the direction of feed in order to cushion the blade during the first part of the cutting stroke.

The above and other objects will appear as the specification progresses, reference being had to the accompanying drawings, in which I have shown the preferred embodiment of my invention, and in which like reference numerals indicate like parts throughout the several views thereof.

In the drawings—

Fig. 1 is a side view of my improved hack saw, showing the saw blade holder and the pivotal connections for the ends of the saw blade.

Fig. 1<sup>a</sup> is a sectional view taken substantially along line 1<sup>a</sup>—1<sup>a</sup> of Fig. 1 and is on a slightly larger scale.

Fig. 2 is a part sectional top plan view taken on the line 2—2 of Fig. 1.

Fig. 3 is an enlarged sectional end view taken on the line 3—3 of Fig. 1.

Fig. 4 is a part sectional end view taken on the line 4—4 of Fig. 1.

Fig. 5 is an enlarged part sectional fragmentary front view, illustrating the saw frame raising means, the dotted lines showing it in raised position.

Fig. 6 is a top plan view thereof.

Fig. 7 is an enlarged detail of the chain link connection.

Fig. 8 is a front view of the chain yoke.

Fig. 9 is an end view thereof.

Fig. 10 is an enlarged sectional view of the feed screw pilot and bearing.

Referring now more particularly to the drawings, the device comprises a base 5 having a socket 6 cast integral therewith and in which a standard 7 is inserted, said standard supporting the main frame and is rotatable to permit the work to be cut at an angle when necessary; a set screw 8 serves to hold the standard in set position, and one side wall 9 of said socket is flat and forms the stationary jaw of the vise in which the work "B" is clamped.

The base is preferably cast hollow as clearly shown in Figs. 1 and 4 of the drawings, a slot 10 being formed in the face thereof, and a similar slot 11 is provided in the lower wall, a boss 12 being cast integral with the one end, and is internally bored and threaded to receive the threaded adjusting rod 13 which is mounted therein, a handle 14 being pivotally connected to the outer end of said rod to facilitate manipulation thereof. A flat-faced jaw 15 is pivotally secured to the opposite end of the rod 13, and is mounted to freely slide on the face of the base, a downwardly projecting rib 16 projecting through the slot, and spaced apart pins 17 are mounted in suitable

openings in said rib, and serve to hold the member in position, bolts 18 being accommodated by the slot 11, and serve to anchor the machine to a bench or other support.

A preferably tubular guide or track member 19 is secured to the standard 7 by means of supporting arms 20, said arms being rigidly secured to the standard and guide by means of pins 21 or the like.

A sleeve member 22 is slidably mounted on the post 7, and a channel shaped laterally projecting frame section 23 is cast integral therewith, an offset leg 24 being cast integral with the sleeve, the outer end being bored to accommodate the guide 19, said leg being split as shown at 25, and a bolt 26 serves to clamp the ends together permitting the leg to freely slide on the guide.

A laterally projecting lug 27 is cast integral with the upper supporting arm 20, and an opening 28 is provided therein adapted to provide a friction bearing for the frusto conical projection of a pilot member 29. The upper end of a feed screw 30 is fixedly secured in the lower part of the pilot member and a handle 31 is formed integral with the upper end of the pilot member to rotate the latter and the screw 30 when desired. An internally threaded bushing 32 is mounted in the frame as shown, and a ratchet wheel 34 is fixedly secured thereon. A pawl-lever 33 is rotatably mounted on the lower end of the bushing, and a pawl 35 is pivotally mounted on said lever in position to engage the ratchet wheel 34, a spring member 36 being anchored to said lever and to a suitable brace 37 provided on the sleeve 22, shown in Figs. 1, 2 and 6 of the drawings, so that as the lever is actuated the pawl 35 in engagement with the ratchet wheel, will rotate the ratchet wheel and the bushing 32 to cause the same to ride downwardly on the screw 30. By holding the ratchet wheel 34 stationary while rotating the screw 30 clockwise by means of handle 31, the ratchet wheel and the bushing may be returned toward the upper part of the screw.

Spaced apart hubs 38 are cast integral with the frame and are bored to form bearings in which the shaft 39 and 40 are journaled, the shaft 39 having a sprocket 41 mounted thereon, and a similar sprocket 42 is mounted on the shaft 40, a gear 43 being mounted on the opposite end of said shaft, meshing with and being driven by a gear 44, which is in turn mounted on the driving motor 45 in any approved manner, the gears 43 and 44 being inclosed in a grease-tight gear box 46, so that the operation will be smooth and noiseless, and a back plate 47 is cast integral with the motor and forms a closure for the back of said gear box.

Guides 48 are secured to the upper and lower side walls of the frame 23 by means of screws 49, and a way 50 is provided in each guide and is



adapted to accommodate spaced apart horizontally disposed bars 51, which form the upper part of the saw frame proper. The ends of the bars 51 are secured to end members 52 and 53, respectively, which are U-shaped in cross section. A blade 54 is connected between the lower ends of the saw frame and is held at its rear end by a conventional tension block 54<sup>a</sup> mounted in a suitably apertured portion at the lower end of the member 52. The front end of the blade is pivotally connected to a compensating link 55, which may be in the form of a suitably shaped block mounted in the apertured lower end of the saw frame member 53 and pivotally connected thereto. When the saw is fed into the work, the link 55 pivots to permit the front end of the blade to spring upwardly, and as the saw advances on the cutting stroke, the link gradually drops back to its normal position. This springing action of the blade produces a cushioning effect which prevents the blade from twisting and chattering and insures a straight cut.

Rollers 56 and 57 are interposed between the bar members 51, the roller 56 being mounted on a suitable pin which is in turn mounted in the hub 58 which forms a part of the main frame, the opposite roller 57 being mounted on an angularly disposed member 59, said member being pivotally mounted on a rib 60, (which is cast integral with the frame) by means of the pin 61, said rollers being so disposed that the frame freely rolls thereon.

A suitable sprocket chain 62 connects the sprockets 41 and 42, and a driving pin 63 is provided intermediate the length of said chain, and engages a slotted opening 64 provided in the yoke 65, which is in turn securely riveted to the bars 51, and it will be clear that as the chain travels, the driving pin which engages the yoke 65 will reciprocate the saw frame accordingly.

The U-shaped member 53 which forms the front end of the saw frame projects above the bars 51, and a slotted contact bar 66 is adjustably mounted thereon by means of screws 67, and as the saw frame is reciprocated, the end of the bar 66 engages the end of the lever 33, swinging it as indicated in dotted lines in Fig. 6 of the drawings, and as the pawl 35 engages the ratchet wheel, it will be clearly obvious that said ratchet wheel and bushing will be rotated on the feed screw 30 which is maintained against rotation by the friction bearing of the parts 27 and 29, and the saw frame will be lowered the desired distance for the next cutting stroke of the saw. The bar 66 can, of course, be adjusted so that the saw "feed" may be regulated as desired, and the spring member 36 forces the lever 33 back to original position.

In the operation of the device, it is essential that the saw be raised on the end of the cutting stroke which is toward the right as seen in Fig. 1, and a pin 68 is, therefore, provided on the upper bar 51, said pin engaging the upper leg 69 of the member 59, rocking it on the pin 61, and as indicated in dotted lines in Fig. 5, and so that the saw frame is raised to position shown in dotted lines of the same figure. The frame is then returned to the left and remains in raised position until it has reached the extreme end of the return stroke, when the pin 70, which is mounted adjacent the end of the bars 51, engages the opposite side of the leg 69, swinging it back to original position, and the saw then feeds into the work on the cutting stroke; a spring washer 71 is mounted on the pin 61 and provides the neces-

sary friction to hold the member 59 in raised position during the return stroke.

What I claim is:

1. A saw-blade holder comprising, in combination, a carrier frame, a saw-blade, means for securing the front end of the blade to the frame permitting the front end of the blade to spring slightly in the plane of the blade during a cutting stroke, and means for securing the rear end of the blade to the frame against movement relative thereto other than pivotal movement and for adjusting the tension of the blade.

2. A saw blade holder comprising, in combination, a reciprocatory frame, a saw blade, and a pair of blocks for attaching the respective ends of the blade to the frame with the cutting edge of the blade normally parallel to the direction of reciprocation and placing the blade under tension lengthwise thereof, the block at the front end of the blade having a slight pivotal movement relative to the frame and to the blade as an incident of the pressure of the blade against a piece of work to decrease the depth of cut during the first part of the cutting stroke and to increase the tension of the blade.

3. A saw-blade holder comprising, in combination, a U-shaped frame having apertures in the ends of the respective legs of the frame, a saw blade, a member secured to the rear end of said blade against movement relative thereto other than pivotal movement and secured rigidly in the aperture in one of the legs of the frame for adjustment longitudinally of the blade to tighten the blade, and a block pivotally secured to the front end of the blade and pivotally secured in the aperture in the other leg of the frame on an axis transverse to the blade to permit the front end of the blade to spring during a cutting stroke in the direction opposite to the direction of feed.

4. A saw-blade holder for hack saw machines comprising, in combination, a carrier, and means for mounting the ends of a blade in the carrier and operable to place the blade under a normal predetermined tension lengthwise thereof, said means having a slight pivotal movement at the forward end of the blade in a direction to increase the tension of the blade and caused as an incident of the pressure of the blade against a piece of work.

5. In a device of the character described, including a base, a standard mounted thereon, a main frame slidably and adjustably mounted on said standard, a saw frame reciprocally mounted on said main frame and including a pair of saw holding arms, a member rigidly held in one of said arms and providing a fixed pivotal connection at one end of the saw, and a member pivotally connected to the other saw frame arm and pivotally connected to the end of the saw to permit one end of the saw blade to spring in the plane of the blade during the cutting stroke.

6. The combination with a power driven hack saw, of a supporting frame, a saw frame reciprocally carried by said supporting frame, power driven means for reciprocating said frame, a saw blade, means for securing the front end of the blade to the saw frame permitting the front end of the blade to spring slightly in the plane of the blade during a cutting stroke, and means for securing the rear end of the blade to the frame against movement relative thereto other than pivotal movement and for adjusting the tension of the blade.

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