(No Model.)

C. P. WARNICK.

Jig Saw.

No. 243,092. **Patented June 21, 1881.**

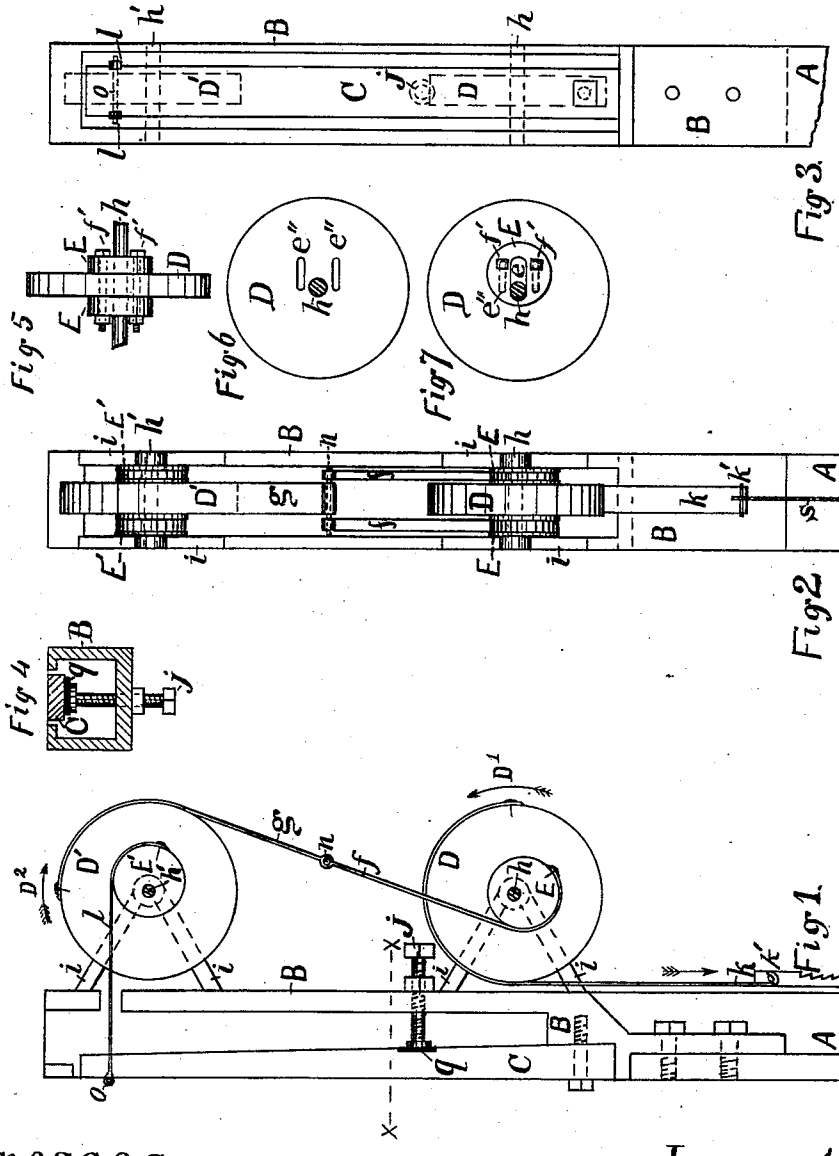

Fig 3.

Fig 5

Fig 6

Fig 7

Fig 2

Fig 4

Fig 1.

Witnesses.

Wm. Zimmerman

Louis F. Hassel

Inventor.

Charles P Warnick

By Gridley & Co

Attys

UNITED STATES PATENT OFFICE.

CHARLES P. WARNICK, OF CHICAGO, ILLINOIS, ASSIGNOR OF ONE-HALF TO LOUIS F. NESSEL, OF SAME PLACE.

JIG-SAW.

SPECIFICATION forming part of Letters Patent No. 243,092, dated June 21, 1881.

Application filed February 24, 1881. (No model.)

To all whom it may concern:

Be it known that I, CHARLES P. WARNICK, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Jig-Saws; and I hereby declare the following to be a full, clear, and exact description thereof, which will enable others skilled in the art to which my invention relates to make and use the same, reference being had to the accompanying drawings, forming a part hereof, and in which—

Figure 1 represents a side elevation with the near side removed so as to show the construction of the several parts. Fig. 2 represents a front view, and Fig. 3 a rear view, of the same. Fig. 4 represents a cross-section of Fig. 1, taken on the line *x x*. Fig. 5 is a front view of one of the pulleys, D, on its shaft *h*, with the eccentric pulleys E E bolted to each side of the pulley D by bolts *f' f'* passing through the three pulleys and slots *e''* of pulley D. Fig. 6 is a side view of the pulley D, with the eccentric pulleys E removed therefrom, showing the slots *e''*, in which the bolts *f'* travel. Fig. 7 is a side view of the pulleys D and E, showing the eccentric pulley E provided with a slot, *e*, through which the shaft *h* passes near its extreme throw, and held in place by the bolts *f'*, and which move with the pulley and in the slots *e''*.

Like letters of reference indicate like parts.

The object of my invention is to give to jig-saws an unvarying and uniform strain throughout all parts of their stroke, and thereby prevent their becoming broken or heated so readily as is the case with the usual construction, and also at the same time be enabled to considerably increase their speed and consequently the amount of work performed.

I construct the machinery necessary to accomplish this end as follows:

In the drawings, A represents a post or standard, upon which is held the cast-iron frame B, provided with hangers *i*, upon which are mounted the shafts *h* and *h'*. The shaft *h* is provided with a pulley, D, upon each side of which is mounted a pulley, E. Said pulleys E may be fixed to the shaft independently, or, preferably, they may be adjustably bolted to the main pulley D. The shaft *h'* is likewise provided with similar pulleys, D' and E'. The pulleys E and E' are shown eccentric to their shafts, the longer radius of the pulley E pointing down, while that of E' points to the right, which position we will call the "starting-point" for a downstroke of the saw. The pulleys E' are connected to the spring C by means of straps *l l*, fastened by a pin, *o*. To the pulley D' is attached a strap, *g*, the lower end of which reaches to and securely holds a bolt or rod, *n*. On each side of the strap *g* are in like manner fastened to said rod *n* two straps, *f f*, the other ends of which are passed partly around and fastened to the pulleys E. To the pulley D is fastened a strap, *k*, the loose end of which is provided with a hook and pin, *k'*, or clamp, to which the saw *s* is attached in the usual manner. The straps *f* and *g* are passed over the opposite faces of the pulleys D' and E, so that they will act on the pulleys in the same manner as a crossed belt. A set-screw, *j*, with a jam-nut, is shown passing through the frame B, and its foot pressing on the spring C for the purpose of regulating the tension of the spring, and thereby that of the saw *s*. The lower end of the saw is connected to a pitman, by which motion is given to the saw in the usual manner.

The operation of the above-described machinery is as follows, to wit: As the saw is pulled downward by the pitman, as shown by the arrow, the pulleys D and E move as indicated by the arrow D^2, and the pulley E being connected to the pulley D' by means of the straps *f f g*, causes it to turn as indicated by the arrow D^2, and by this motion will pull on the straps *l* and cause them to wind on the pulleys E' and bend the spring C inward. As is well known, the spring C will resist the motion just described with a constantly increasing force as the straps wind upon the pulley E', or, in other words, as the saw descends. In order, therefore, to compensate for this constantly increasing resistance to the saw, I set the pulleys E' eccentric to their shaft, so that, when the saw has reached the end of its downward stroke, and the spring C is at its greatest tension, the shortest radius of the pulley E' shall be in contact with the strap. In order, however, to enable me to increase the motion

of the saw to the greatest possible speed, I add a second pulley, D, to which the pulley D′ is attached by means of the straps *f f g*, and which operates upon the pulleys E and D, and through it and strap *k* upon the saw *s*. In this case both sets of eccentric pulleys, E and E′, in part compensate for the increased tension of the spring, and at the same time greatly increase the speed of the saw.

It is well known that a spring employed to act directly upon the saw, or even through an intermediate large and small pulley, one of which may be placed eccentrically upon the shaft, must vibrate considerably, and that the greater the vibrations the longer the time required for each vibration, and consequently the less the number of strokes per minute made by the saw. Another advantage of my arrangement is that the short vibrations of the spring cause less tremor, and this is still further obviated by the contrary motion of the pulleys, whereby the tendency to cause tremor by one set of pulleys is compensated by that of the other.

The pulleys D and D′ also compensate for the increased tension of the spring by their momentum, which constantly increases from the beginning to the middle of the stroke, after which the momenta acquired by the two pulleys will tend in a great measure to overcome the increasing resistance of the spring, and they may be made to overcome it wholly, if made large and heavy enough. It is evident, therefore, that the pulleys E and E′ should bear a definite proportion to the pulleys D and D′, depending on the weight of the latter, the speed of the saw, and the eccentricity of the pulleys E and E′, which should be made adjustable, and for which purpose the said pulleys should be adjustably bolted against the large pulleys, so that their eccentricity may be increased or decreased at pleasure, and thereby the otherwise constantly increasing tension of the spring upon the saw so compensated as to give to the saw a constant and uniform strain from the beginning to the end of its stroke.

One shaft and set of pulleys may be used, as shown; but in practice I prefer two, as herein described.

A rubber cushion, *q*, may be placed under the foot of the set-screw, which tends to prevent the great vibration or jar resulting when the saw runs at high speed.

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

1. The scroll-saw mechanism consisting of the frame B, provided with hangers *i* and shaft *h*, provided with pulleys D′ E′, in combination with a spring, C, attached to the frame B, and provided with a set-screw, *j*, attached to frame B and provided with an elastic cushion, *q*, and straps *l*, connecting spring C with pulley E′, all constructed and arranged to operate substantially as and for the purpose set forth.

2. The scroll-saw mechanism consisting of the frame B, provided with shafts *h* and *h′*, upon which are mounted the pulleys D D′, provided with straps *g* and *k*, and pulleys E and E′, provided with straps *f*, united to the strap *g*, and straps *l*, attached to pulleys E′, and spring C, attached to frame B, and set-screw *j*, attached to frame B, and provided with an elastic foot, *q*, all arranged to operate substantially as and for the purpose specified.

3. The jig-saw mechanism consisting of the frame B, upon which are mounted pulleys D and D′, each of which has provided and arranged to move with it eccentric pulleys E and E′, a spring, C, provided with a set-screw, *j*, and said pulleys, saw, and spring connected by straps *l*, *g*, *f*, and *k*, to operate substantially as and for the purpose specified.

4. The jig-saw mechanism consisting of the frame B, upon which are mounted pulleys D and D′, each provided with eccentrically-adjustable pulleys E and E′, spring C, and all connected by straps *l*, *g*, *f*, and *k*, to operate substantially as and for the purpose specified.

CHAS. P. WARNICK.

Witnesses:
WM. ZIMMERMAN,
LOUIS F. NESSEL.