(No Model.) 2 Sheets—Sheet 1.

G. W. DAVISON & J. BUCKLEY.

SHAPING MACHINE.

No. 384,963. Patented June 26, 1888.

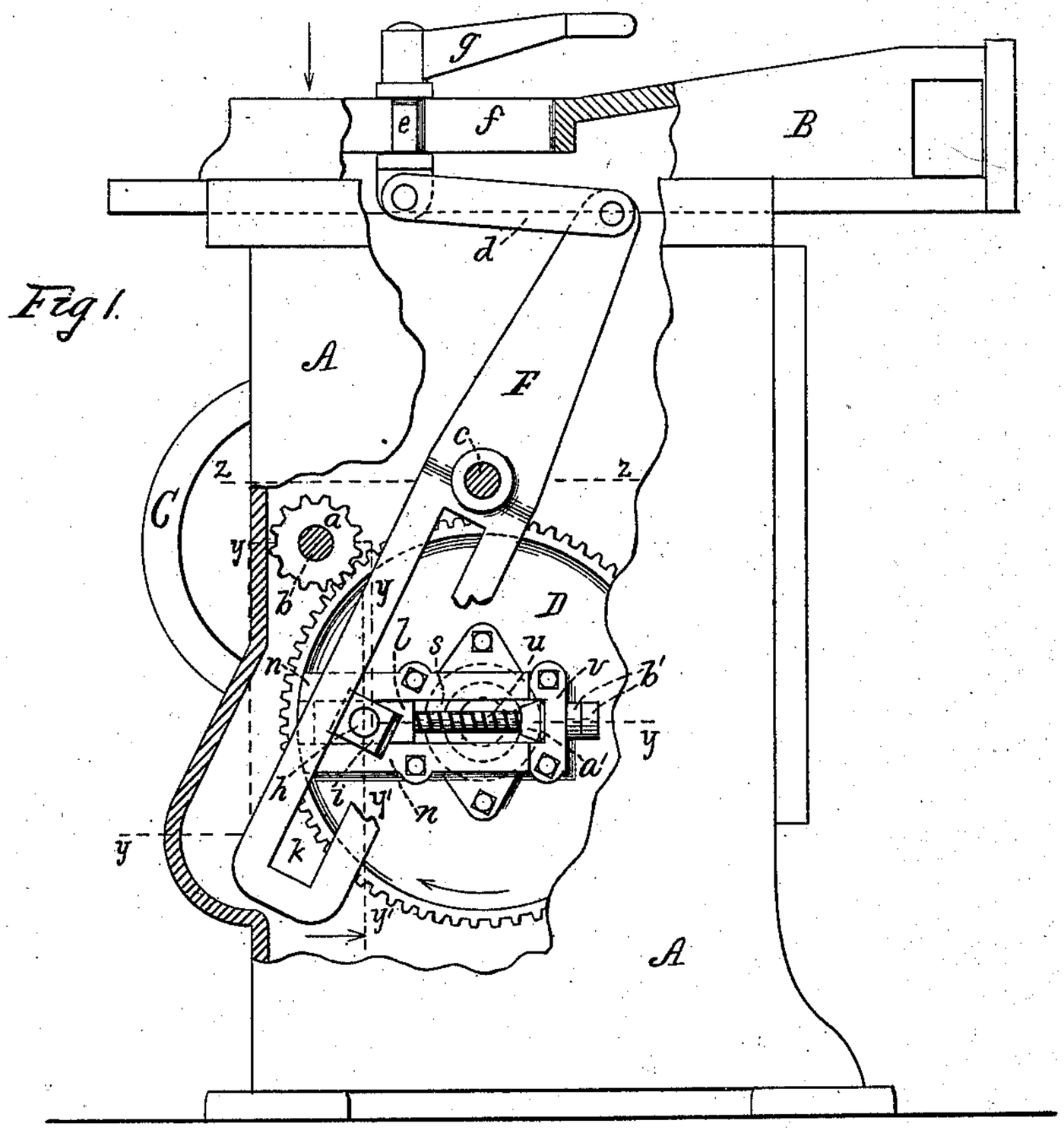

Fig 1.

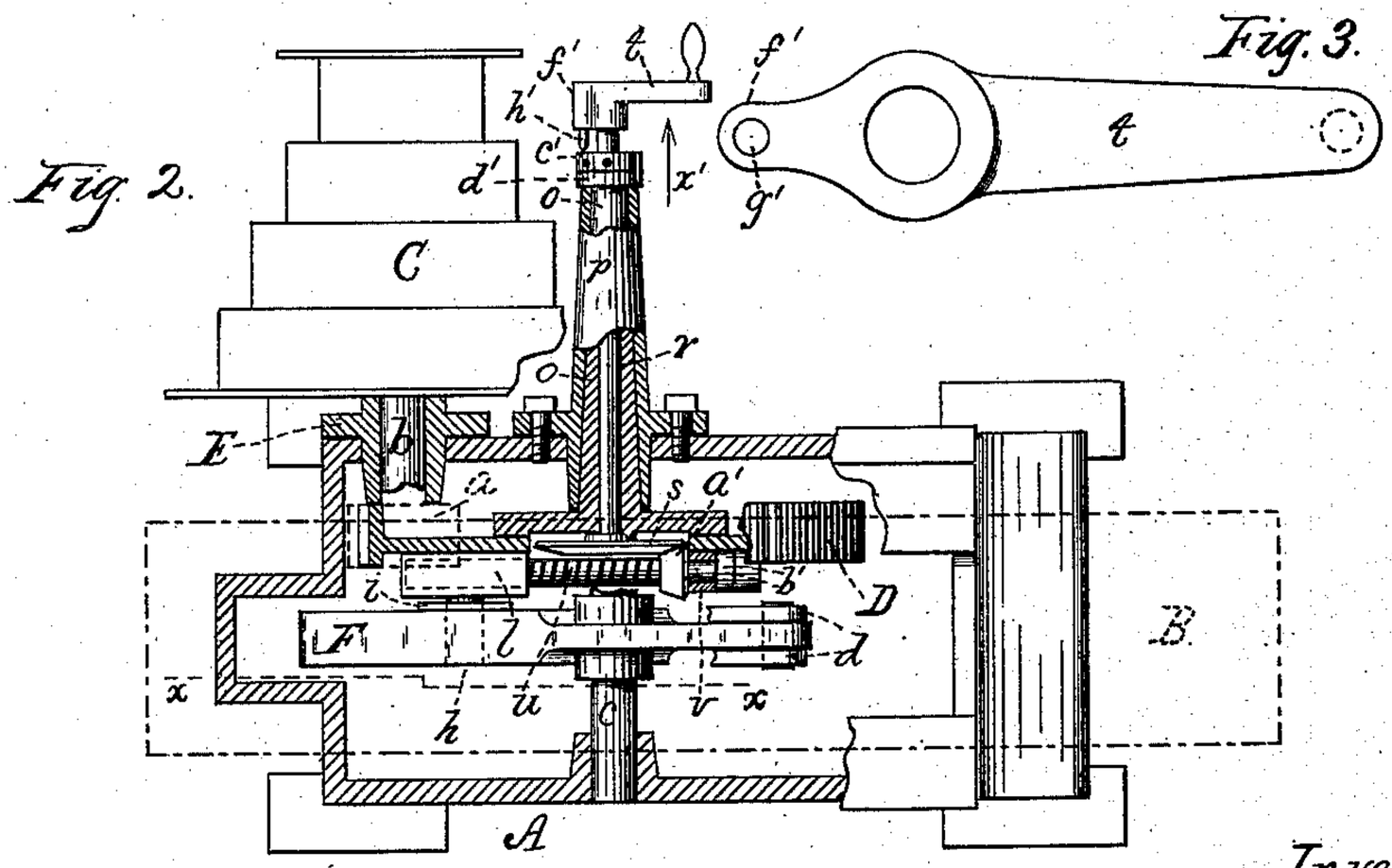

Fig. 2.

Fig. 3.

Attest:
M. McDermott,
L. G. Whitmore.

Inventors:
Geo. W. Davison,
John Buckley.
By C. B. Whitmore, Atty.

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Fig. 4.

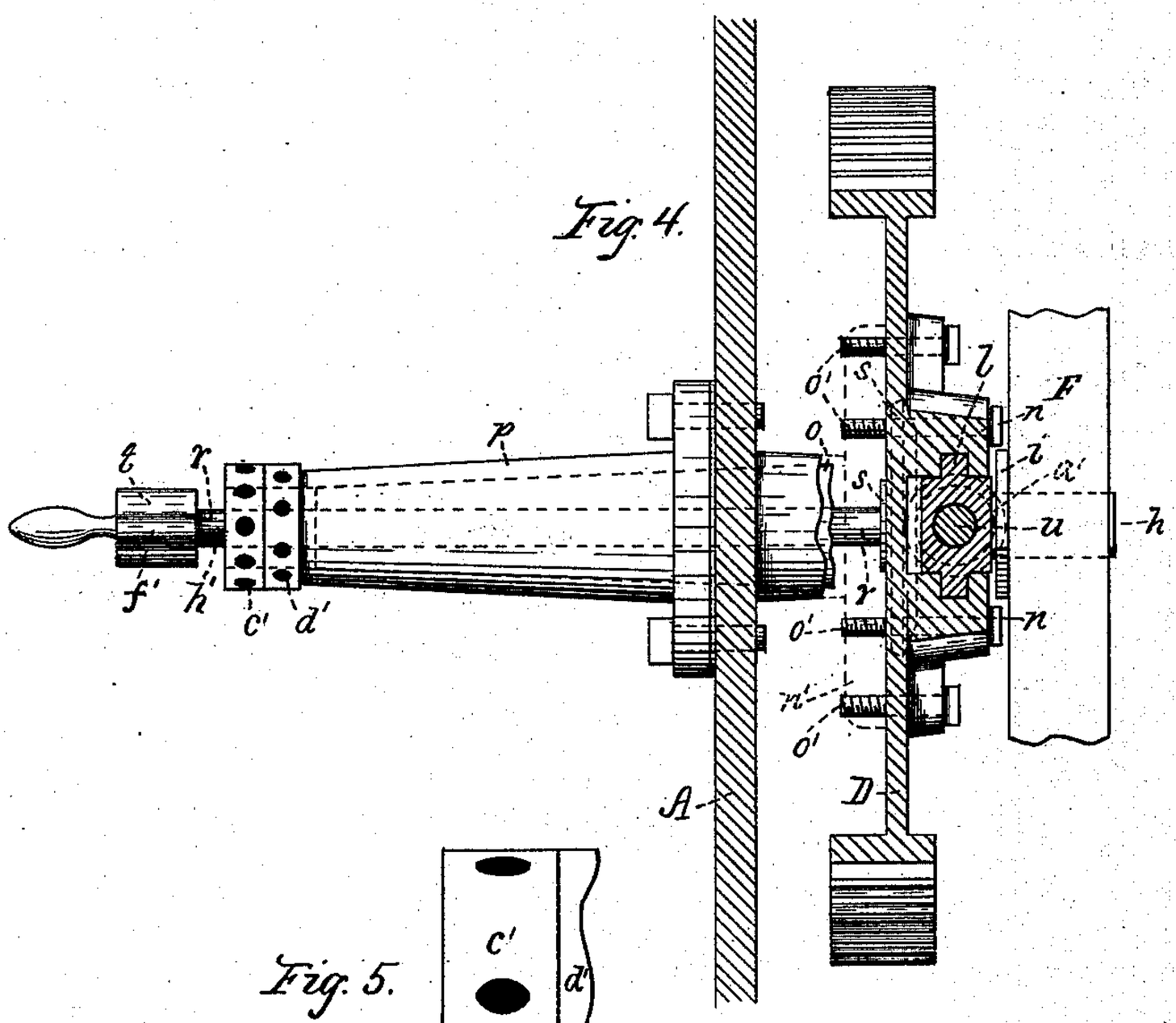


Fig. 5.

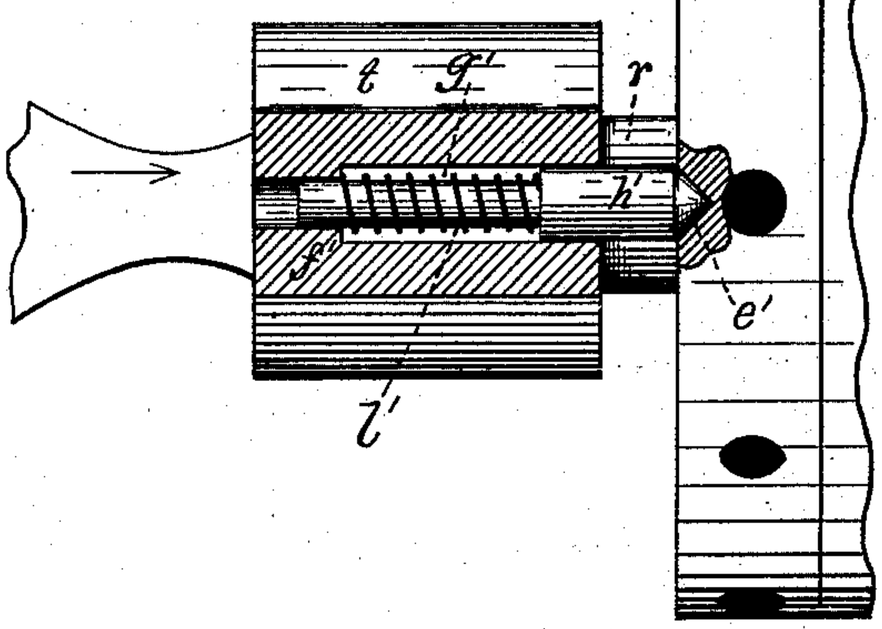
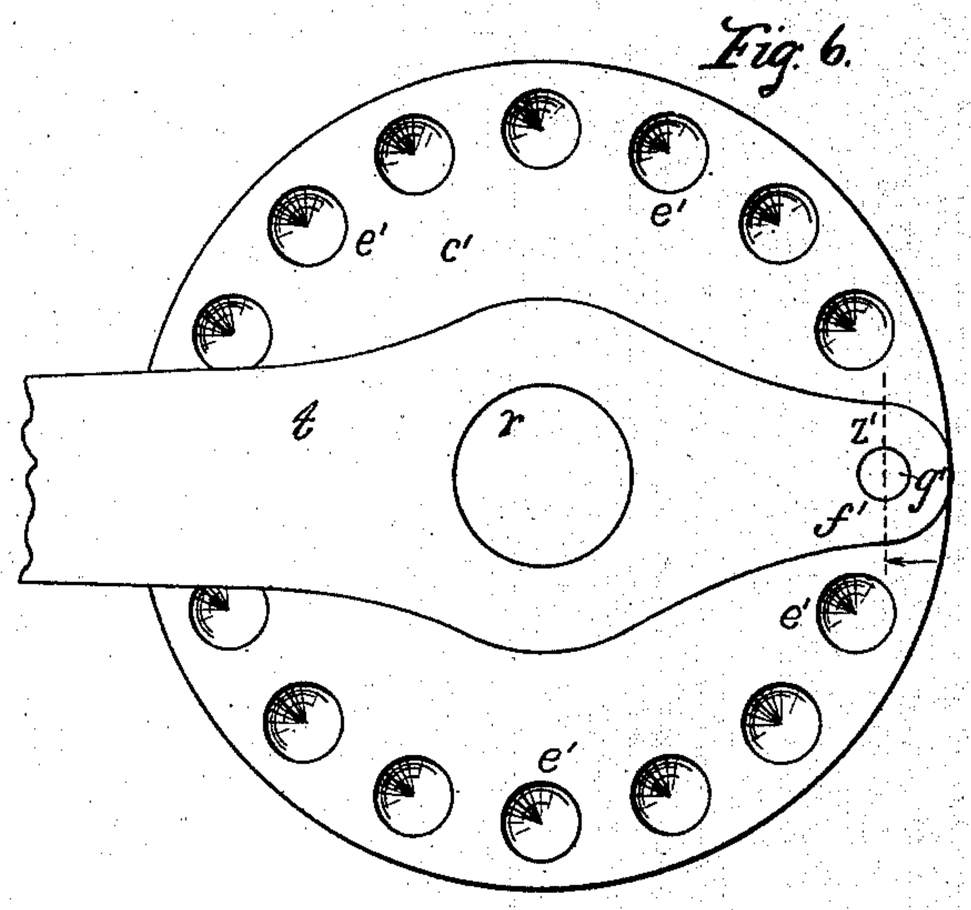


Fig. 6.



Attest:
W. H. Whitmore.
M. L. McDermott.

Inventors:
Geo. W. Davison.
John Buckley.
By E. B. Whitmore, Atty.

UNITED STATES PATENT OFFICE.

GEORGE W. DAVISON AND JOHN BUCKLEY, OF ROCHESTER, NEW YORK.

SHAPING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 384,963, dated June 26, 1888.

Application filed October 17, 1887. Serial No. 252,613. (No model.)

To all whom it may concern:

Be it known that we, GEORGE W. DAVISON and JOHN BUCKLEY, of Rochester, in the county of Monroe and State of New York, have invented a new and useful Improvement in Shaping-Machines, which improvement is fully set forth in the following specification and shown in the accompanying drawings.

This invention relates to that class of shapes or machines for shaping metal pieces in which the ram for carrying the cutting-tool is reciprocated or driven by a crank. In doing different kinds of work with these machines the stroke of the ram—that is to say, the distance it is caused to travel backward and forward in its guides—has to be frequently varied, which variations are effected by changing the throw of the crank.

Our invention relates mainly to the method or the means employed by which the throw of the crank may be conveniently and accurately adjusted while the machine is running and without stopping its motion, the invention being hereinafter fully described, and more particularly pointed out in the claims.

Referring to the drawings, Figure 1 is a side elevation of a shaping-machine with our improvements attached, parts being broken away and other parts below the ram being vertically sectioned, as on the dotted line *x x* in Fig. 2; Fig. 2, a plan of the machine with parts broken away, a part of the frame, with the main driving-gear and other parts, being horizontally sectioned, as on the broken dotted line *y* in Fig. 1, the part of the frame nearest the observer being sectioned on the dotted line *z z* through one of the trunnion-bearings of the lever; Fig. 3, a view of the hand-crank, drawn to a larger scale, seen in the direction indicated by arrow *x'* in Fig. 2; Fig. 4, a vertical section of a portion of the frame, the main driving-wheel and other parts taken as on the dotted line *y'* in Fig. 1 and viewed as indicated by the arrow pointed thereon, parts being broken away; Fig, 5, a view of detached parts, seen in the direction in which Fig. 4 is seen, the hand-crank and a part of the index-disk being sectioned as on the dotted line *z'* in Fig. 6; and Fig. 6, a plan of the index-disk with a portion of the hand-crank in place, the view being taken as indicated by arrow in Fig. 5. Fig. 4 is drawn to a scale twice that of Figs. 1 and 2, and Figs. 5 and 6 drawn to a scale of the full size to which the machine is built, being eight times that of Figs. 1 and 2.

Referring to the parts shown in the drawings, A is the frame of the machine, it being of the inclosed or box form; B, the ram, and C the step driving-pulleys, all substantially of common form.

D is the main driving gear or wheel, and *a* the driving-pinion, secured to the horizontal shaft *b* of the pulley C, said shaft resting in a suitable bearing, E, secured to the frame.

F is a slotted lever secured to a horizontal shaft, *c*, having bearings in the two opposite sides of the frame, so as to oscillate in a vertical plane near to and parallel with the side of the vertical wheel D, the axes of said lever and wheel being preferably in the same vertical plane.

d are links connecting the upper end of the lever with the adjustable stud-bolt *e*, passing up through a longitudinal slot, *f*, in the ram and secured to the latter by the lever-nut *g*.

h is a crank-pin for driving the lever, secured to the wheel D, the pin being provided with a square block, *i*, fitted to slide along the longitudinal slot *k* in the lever as the wheel D is revolved.

From this description of the parts it will be understood that when the wheel D is rotated the lever F will be oscillated and cause the ram to reciprocate in its bearings in the frame. The pin *h* is formed with a rectangular head, *l*, fitted to slide between grooved ways *n* in a line at right angles with and intersecting the axis of the wheel D, said grooved ways or guides being a part of the wheel. The wheel D and the pin *h* together form a crank for driving the lever F. The distance through which the ram moves at any time depends upon the distance of the crank-pin *h* from the axis of the wheel D, and to provide means by which to adjust and hold the pin upon the wheel is the essential part of our invention.

The wheel D is made rigid with a shaft, *o*, preferably tapered, as shown, which shaft rests in a sleeve or holder, *p*, secured to the frame and extending out at the side of the latter to a distance to give the shaft *o* a sufficient length of bearing. The shaft *o* is formed with a

straight axial bore, in which rests a slender shaft, *r*, to the inner end of which shaft *r* is secured a bevel-gear, *s*, and to the outer end of which shaft is secured an operating crank or handle, *t*, by means of which the beveled gear may be turned.

u is a screw-shaft between the ways *n*, fitted to a threaded bore in the crank-pin. This screw-shaft is parallel with the ways *n* and rests at one end in a bearing, *v*, rigid with the wheel D, the pin *h* constituting a bearing for the other end, said screw-shaft being provided with a rigid pinion, *a'*, in position to co-operate with the bevel-gear *s*.

b' are jam-nuts or adjustable collars secured to the screw-shaft *u* upon the outside of the bearing *v*, which collars, with the pinion *a'*, prevent endwise movements of the shaft *u*. It will be now understood that by turning the handle *t* in one direction or the other the crank-pin *h* will be moved toward or from the axis of the wheel D, causing the extent of the motion of the ram to be varied at pleasure and without interfering with or stopping the motion of the machine.

When the crank-pin is at any time adjusted to move the ram as required, it is held to place by the means described, as follows: The shaft *o* is formed at its outer end to extend beyond the end of the sleeve *p* sufficiently to receive two disks, *c'* and *d'*, which are internally screw-threaded, the projecting end of the shaft *o* being correspondinly threaded. The inner disk, *d'*, acts as an adjustable collar for the shaft *o*, it bearing against the end of the sleeve *p* to prevent endwise travel of said shaft *o* in a direction toward the lever F. The outer disk, *c'*, is provided with a series of depressions, *e'*, upon its uncovered side, equally spaced and ranged in a circle concentric with the disk. The hand-crank *t* is formed with an extended part, *f'*, which, as the crank is turned, swings around over this circle of depressions. The part *f'* of the crank is bored out at *g'* in a line parallel with the shaft *r*, in which bore is fitted a needle, *h'*, formed with a conical point to occupy any one of the depressions *e'* that may at any time be presented to it. The needle is gently urged against the disk *c'* by means of a slender spiral spring, *l'*, within the bore *g'*, as shown in Fig. 5. The shaft *r* is fitted to turn independently of the shaft *o*, and when both shafts turn together no motion of the crank-pin *h* will take place. The needle occupying one of the depressions *e'* serves to lock the shafts *o* and *r* together, so that both shafts must move or cease rotating together, in which case the crank-pin *h* is held to its place of adjustment within the ways *n*. To alter the throw of the crank-pin *h* the hand-crank *t* is turned one way or the other, the needle, on account of its conical point, gliding out of the depressions *e'* as the crank is turned.

We have made the relation of the gears *s* and *a'* and the lead of the thread of the screw-shaft *u* such with reference to the number of the depressions *e'* that by turning the crank *t* from one depression *e'* to the next the stroke of the ram will be lengthened or shortened to the amount of a given division of an inch—that is to say, to the amount of one-sixteenth of an inch. To explain more fully, if in doing any piece of work with this shaping-machine the cutting-tool moves forward to a given point at each movement of the ram, then by changing the crank *t* so the needle will occupy the next depression on either side the point of the cutting-tool will move one sixteenth of an inch beyond the given point or fall to a like amount short of said given point as the ram moves.

The wheel D is formed with a central circular opening, *k'*, to receive the bevel-gear *s*, and the shaft *o* is expanded into a broad circular flange, *n'*, to cover said opening and bevel-gear, the flange being secured rigidly to the wheel D by bolts *o'*.

The threaded disk *c'*, in addition to the use above described, acts as a jam-nut for the disk *d'*, serving to hold the latter rigidly in place upon the shaft *o* when it is properly adjusted. When the shaft *o* wears so as to run loosely in its taper-bearing within the holder *p*, it can be tightened by adjusting the disk or collar *d'* and holding it to place by the disk *c'*, as stated.

What we claim as our invention is—

1. In combination with the vibrating lever of a shaping-machine, a driving-crank for said lever formed with an adjustable pin, a screw-shaft to move said adjustable pin of the crank, a bevel-gear and pinion to turn said screw-shaft, a shaft for said bevel-gear, and an actuating handle or crank for said shaft for the bevel-gear.

2. In combination with the vibrating lever of a shaping-machine, a driving wheel or crank for said lever, said wheel or crank being supported upon a hollow shaft and formed with an adjustable pin, a screw-shaft to move said adjustable pin of the crank, a gear and pinion to turn said screw-shaft, a shaft for said gear held within the bore of said hollow shaft, and an actuating-handle for said shaft for the gear.

3. In a shaping-machine, in combination with the vibrating lever, a driving-wheel for said lever provided with an adjustable pin and formed with a central opening or cavity, a screw-shaft to operate said adjustable pin, a pinion on said screw-shaft, a gear to turn said pinion, said gear occupying said cavity in the driving-wheel, a shaft for said gear, and an actuating-handle for said shaft.

4. In combination with the vibrating lever of a shaping-machine, a driving wheel or crank for said lever supported by a tapered hollow shaft, said wheel or crank having an adjustable pin, a screw-shaft to operate said adjustable pin, a pinion and gear to turn said screw-shaft, a shaft, *r*, for said gear held in the bore of said tapered shaft, an actuating-crank for said shaft *r*, a holder or bearing for said tapered

shaft, and an adjustable collar for said tapered shaft held to bear against said holder for the tapered shaft.

5. In a shaping-machine, in combination with the vibrating lever, a driving wheel or crank for said lever having a hollow shaft and an adjustable pin, a screw-shaft to operate said adjustable pin, a pinion and gear to turn said screw-shaft, a shaft for said gear resting within said hollow shaft, a bearing or holder for said hollow shaft, a disk formed with a series of depressions secured to said hollow shaft, an actuating-handle for said shaft holding the gear, and a needle held by said handle to enter said depressions in the disk.

6. In a shaping-machine, in combination with the vibrating lever, a driving wheel or crank for said lever having a hollow shaft and an adjustable pin, a screw-shaft to operate said adjustable pin, a pinion and gear to turn said screw-shaft, a shaft for said gear resting within said hollow shaft, a bearing or holder for said hollow shaft, a disk formed with a series of depressions secured to said hollow shaft, an actuating-handle for said shaft holding the gear, a needle held by said handle to enter said depressions in the disk, and an actuating-spring to press said needle.

GEORGE W. DAVISON.
JOHN BUCKLEY.

Witnesses:
E. B. WHITMORE,
M. L. MCDERMOTT.