No. 681,199. Patented Aug. 27, 1901.

# M. C. CRANE.

## WORK HOLDER.

(Application filed Aug. 11, 1900.)

(No Model.) 2 Sheets—Sheet 1.

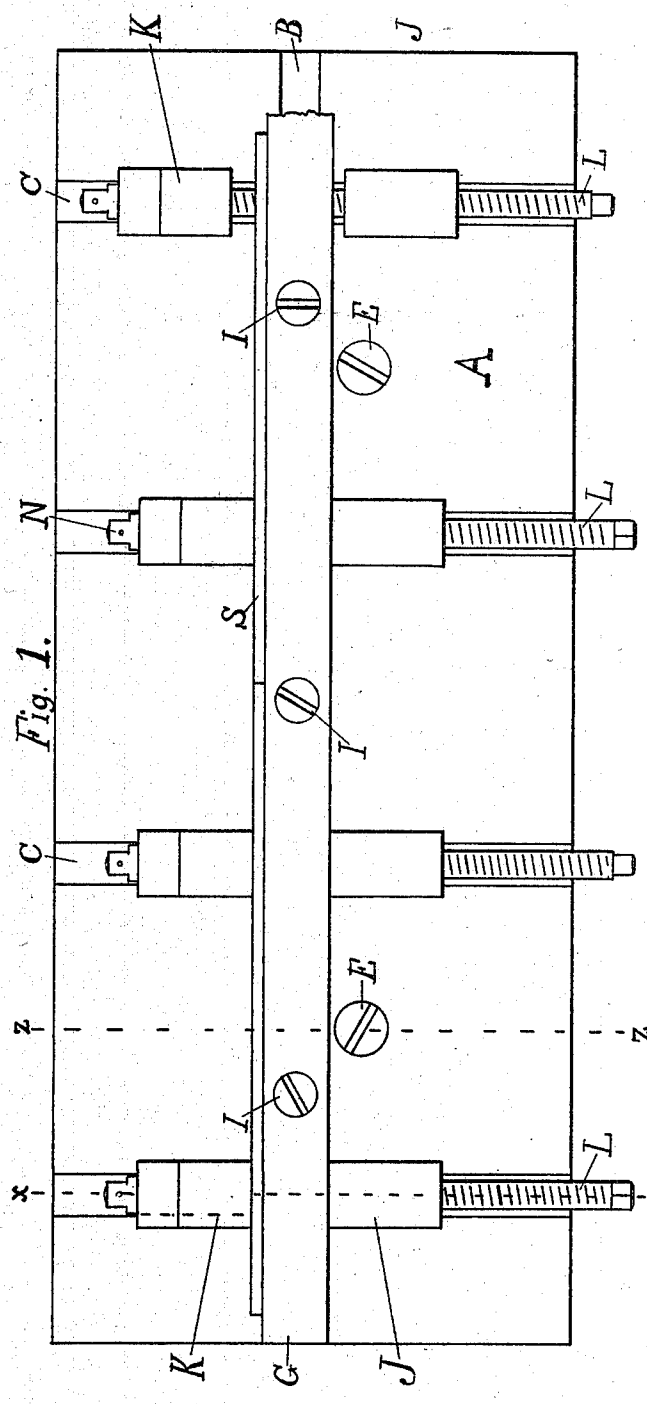



Fig. 1.

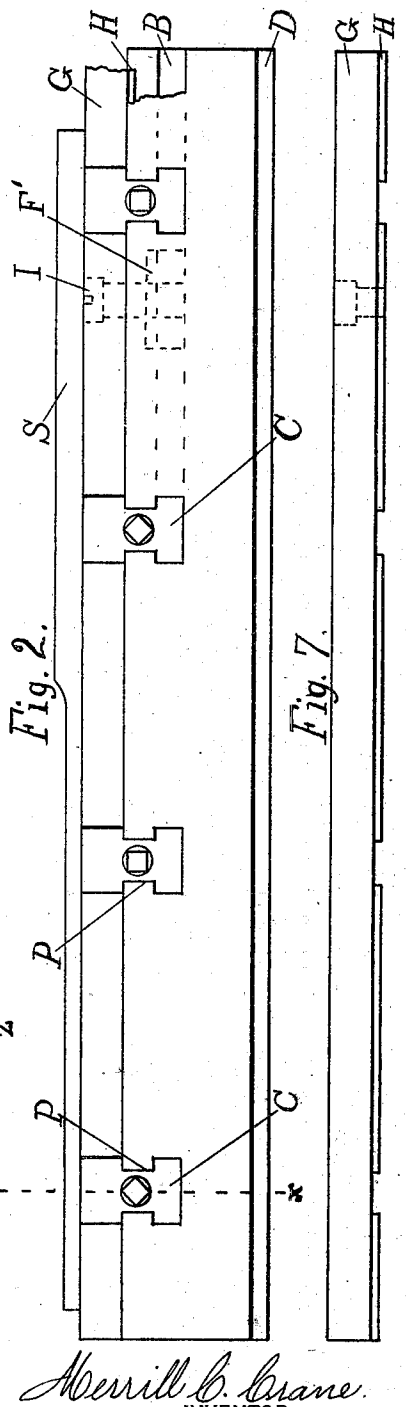



Fig. 2.




Fig. 7.

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Fig. 3.

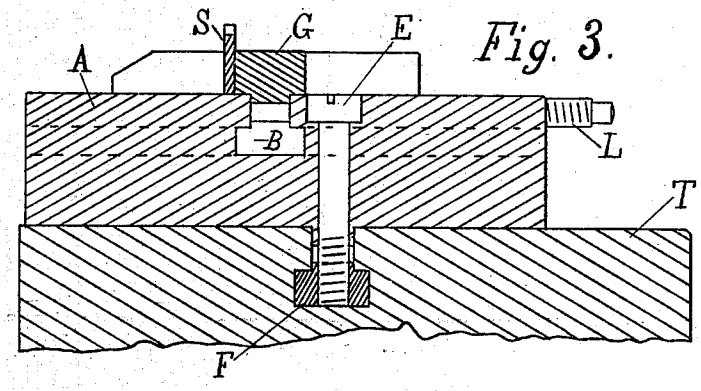



Fig. 4.

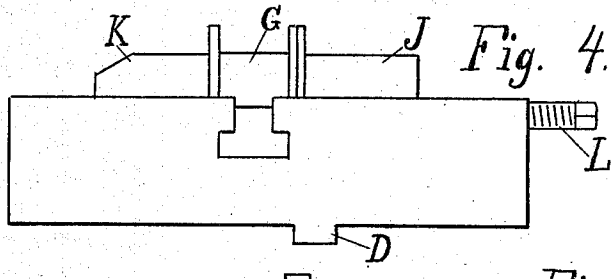



Fig. 5.

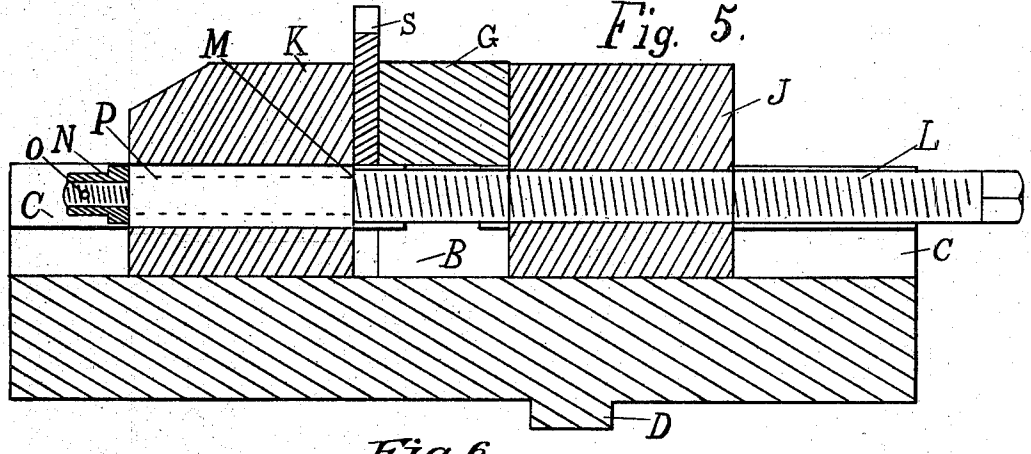
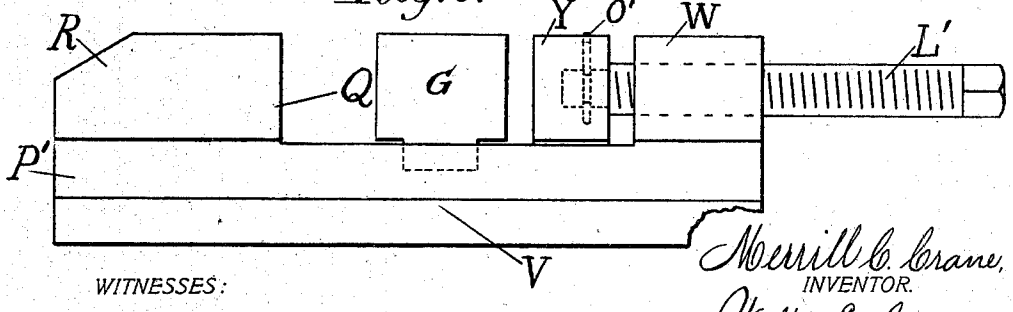



Fig. 6.




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# UNITED STATES PATENT OFFICE.

MERRILL C. CRANE, OF NEW BEDFORD, MASSACHUSETTS.

## WORK-HOLDER.

SPECIFICATION forming part of Letters Patent No. 681,199, dated August 27, 1901.

Application filed August 11, 1900. Serial No. 26,633. (No model.)

*To all whom it may concern:*

Be it known that I, MERRILL C. CRANE, a citizen of the United States, residing at No. 22 Homer street, in the city of New Bedford, county of Bristol, and Commonwealth of Massachusetts, have invented a new and useful Improvement in Work-Holders, of which the following is a specification.

This invention relates to work-holders for milling-machines, shapers, and other machines, and is more especially adapted to small or thin work. It is designed to provide, first, a work-holder having capacity for holding work of greater length than the ordinary vise; second, a work-holder that will independently and firmly secure the work at intervals throughout its length; third, a work-holder adapted to sustain and secure the work in a more nearly perfect position than the ordinary means employed; fourth, a work-holder adapted to sustain the work in duplicate for simultaneous operations, and, fifth, a work-holder which shall be capable of great facility of operation and without loose or separate pieces.

In performing milling and other operations upon thin strips cut from the sheet or as originally rolled in strips difficulty is experienced in keeping the same in a proper true position owing to slight unevennesses and waviness, &c., of the material when more than one strip is put into the ordinary vise at a time. If there is at any point on one of the strips a "high place" which does not happen to be compensated for by a "thin place" or "low spot" on the adjoining strip, then the strips are pinched by the vise chiefly at this high place, and the other portions of the work are more or less free to tip to the right or left or to slip down in the vise while being operated upon by the cutter or tool. Hence it is found desirable to have separate and independent clamping means at short intervals along the strip. It is found that the inequalities in the strips and the "bur" which is formed at the edges of the work by the cutter tend to wedge the pieces apart and tip them out of their true positions, and hence it is ordinarily found best to hold them singly, or at least not more than two together, while performing the operations upon them. This necessarily makes the work slow, and to facilitate it I have designed this attachment with two separate and independent faces against which to secure duplicate strips or sets of strips and to secure them thus in two places by a single clamping means at each of the intervals at which the work is secured. It is a great convenience and it is very conducive to perfect work to have the clamping-faces against which the work is secured easily trued up and while secured in their working position and by the usual cutters and tools used in the machine, and this I have fully achieved in my improved thin-work holder shown herein.

In the accompanying drawings, Figure 1 is a plan view of the work-holder having a strip S partly clamped therein. Fig. 2 is a side elevation of the same. Fig. 3 is a transverse section on line Z Z of Fig. 1 as seen from the left, and also showing a portion of the milling-machine table and the means for securing the holder thereto. Fig. 4 is an end view of the holder as seen from the left in Fig. 1, with strips secured at both sides of the T-strip. Fig. 5 is an enlarged sectional elevation on line $x$ $x$ of Fig. 1 as seen from the left, showing the details of the screw and clamping-jaws. Fig. 6 represents a modified form of clamping-jaws and screw. Fig. 7 is a longitudinal elevation of the T-strip, showing the cutting away of the tongue where the screws pass beneath. In Figs. 1 and 2 a portion of the T-strip is broken away to more clearly show the T-slot and tongue H.

Similar characters denote like parts in the several views.

The principal part of the work-holder, the platen A, is provided with a longitudinal T-slot B and cross-slots or transverse T-slots C, also with the tongue D underneath, by means of which to aline the platen A with the milling-machine table T, to which it is secured by the screws E and nut-blocks F. The T-strip or T-piece G, against the vertical faces of which the work is secured, is securely fastened to the platen A, the tongue H of the T-piece G being fitted closely into the upper part of the longitudinal slot B and being secured in position by screws I and nut-blocks F′, as shown by dotted lines in

Fig. 2. The tongue H is cut away at the cross-slots, as shown in Fig. 7, to make room for the clamping-screws.

Inserted in the cross-slots C so as to slide closely therein are the front and back or oppositely-disposed clamping-jaws J and K, respectively, and to operate these jaws the clamping or adjusting screw L is threaded through the jaw J and journaled through the jaw K, the shoulder M and nut N preventing end movement of the jaw K with reference to the screw L. The nut N is secured from turning loose upon the screw L by the pin O. The clamping-jaws J and K form a duplex clamp and are secured from tipping in the platen A by means of the grooves P, cut in each side of the jaws engaging with the surface of the platen A at the upper part of the T-slots C. The jaws J and K and the screw L are free to slide crosswise in the platen A and are therefore adapted to receive thick or thin strips S between them and either or both faces of T-piece G, and the work thus placed will be securely clamped by tightening the screw L.

In Fig. 6 is shown a modified form of clamp, which is designated in a general way by Q. It has side grooves P′, similar to the grooves P of jaws J and K, and is adapted to fit into and slide in the cross-slots C. The left-hand end R is similar to the jaw K; but its lower portion is extended to the right, as represented at V, beneath the surface of platen A and in the slot C when in place and rises, terminating in the part W, through which is tapped the clamping-screw L′. The inner end of this screw is reduced and provided with an annular groove, and upon this portion is revolubly secured the thrust-block Y by means of the pin O′. The thrust-block Y and part R of the jaw are adapted to be impinged against the work S, the same as jaws K and J, by operating the screw L′.

In case the table of the milling or other machine has cross-slots it may be used as a substitute for the platen A.

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

1. In a work-holder, the combination, with a T-piece having opposite work-engaging surfaces, of a platen having transverse slots; oppositely-disposed jaws movable in the slots; and clamping-screws to operate the jaws.

2. In a work-holder, the combination, with a platen having a longitudinal slot, of a T-piece secured therein; a series of transverse slots extending upon opposite sides of said T-piece; oppositely-disposed clamping-jaws mounted in the transverse slots; and means for operating the said clamping-jaws.

3. In a work-holder, the combination, with a platen, of a fixed longitudinal T-piece, having opposite work-engaging surfaces; oppositely-disposed clamping-jaws, mounted for transverse movement; and means for operating the said clamping-jaws.

4. In a work-holder, the combination, with a platen, of a fixed longitudinal strip having oppositely-disposed work-holding surfaces; a series of duplex opposing clamps, in position and adapted to be simultaneously impinged against either or both of the said surfaces, or interposed work; and means for operating the said clamps.

5. In a work-holder, the combination, with a paten having a fixed longitudinal strip, provided with oppositely-disposed work-engaging surfaces; of duplex opposing clamps mounted in transverse slots in the platen; and means for impinging the clamps against work placed against either or both of said work-supporting surfaces of the strip.

6. In a work-holder, the combination, of a platen having a longitudinal T-slot; a longitudinal strip having oppositely-disposed work-holding surfaces, secured to the said platen; cross T-slots in the platen at right angles to said strip; duplex, oppositely-disposed clamping members in each cross-slot; and a clamping-screw for drawing the said clamping members together.

7. In a work-holder, the combination, with a platen, of a longitudinal strip, having opposite, parallel, work-engaging surfaces; and transverse clamps supported in position, and adapted to simultaneously impinge work against both sides of said strip.

8. In a work-holder, the combination, with a platen, of a longitudinal strip, having opposite work-engaging surfaces; duplex, oppositely-disposed clamping-jaws, supported in position and adapted for transverse movement; and clamping-screws for simultaneously impinging said jaws against the opposite sides of said strip, or work interposed at one or both sides thereof.

9. In a work-holder, the combination, with a platen having a central strip embodying opposite work-engaging surfaces, of a series of independent duplex clamps, mounted for transverse movement upon opposite sides of said work-engaging surfaces; and means for closing the said duplex clamps.

10. In a work-holder, the combination, with a platen having a series of cross-slots, of a series of duplex, opposing, clamps, mounted in the said slots for free transverse movement independent of the closing means; clamping-screws for closing the clamps, and a fixed longitudinal strip, having opposite work-engaging surfaces, intermediate the opposing members of the said duplex clamps.

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