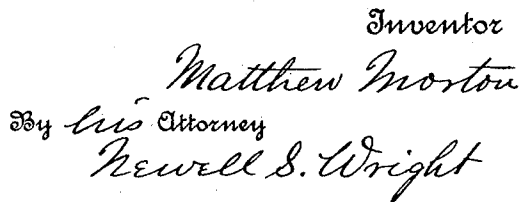


3 Sheets—Sheet 1.

Patented Feb. 2, 1892.



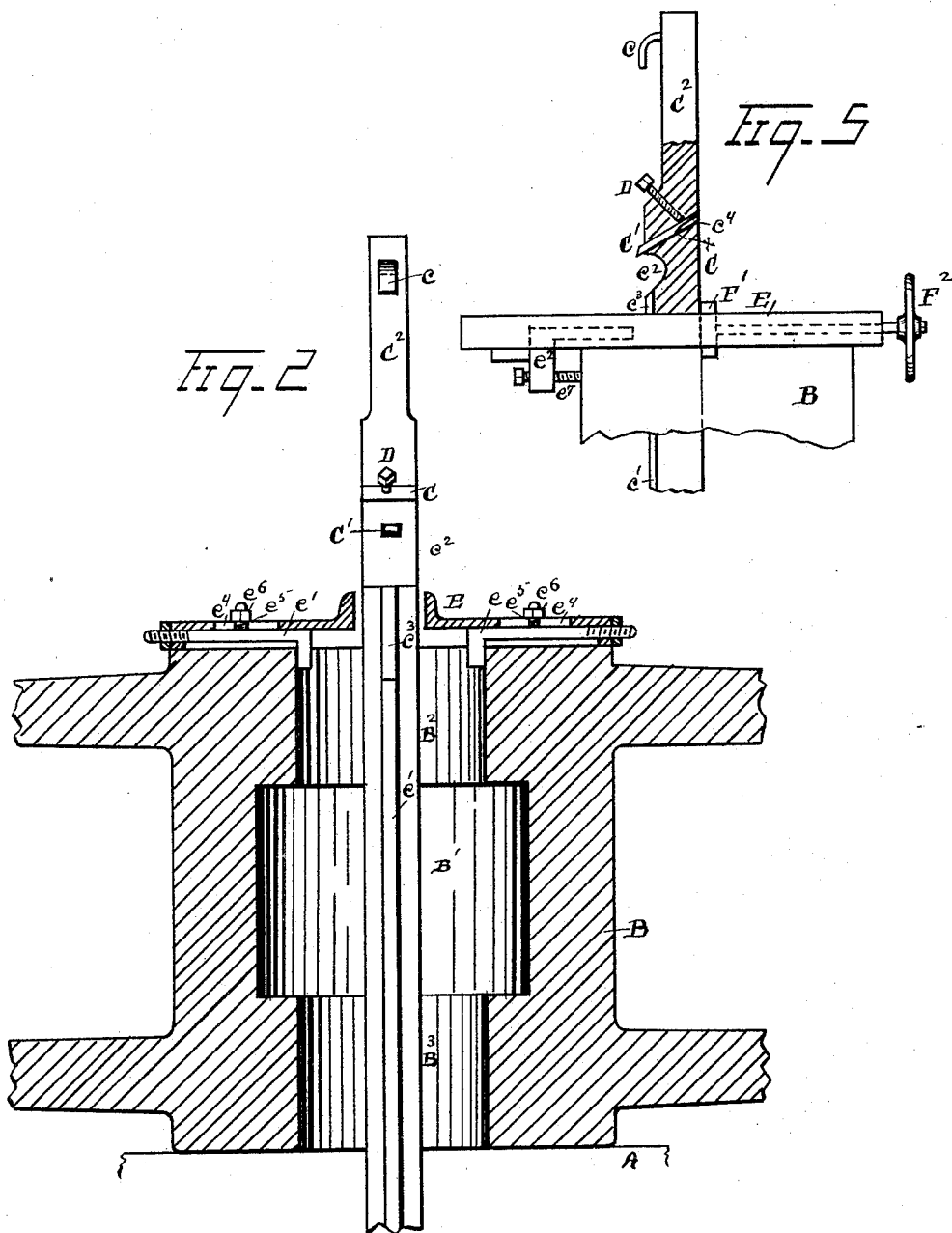
(No Model.)

3 Sheets—Sheet 2.

M. MORTON.  
KEY SEAT CUTTING MACHINE.

No. 468,072.

Patented Feb. 2, 1892.



Witnesses  
John Schuman  
John F. Miller

Inventor  
Matthew Morton  
By his Attorney  
Newell S. Wright.

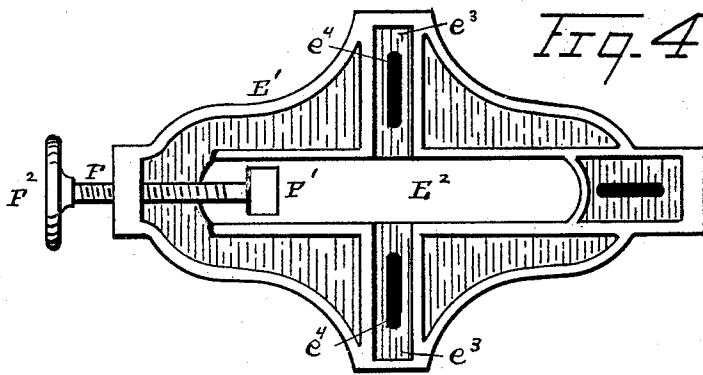
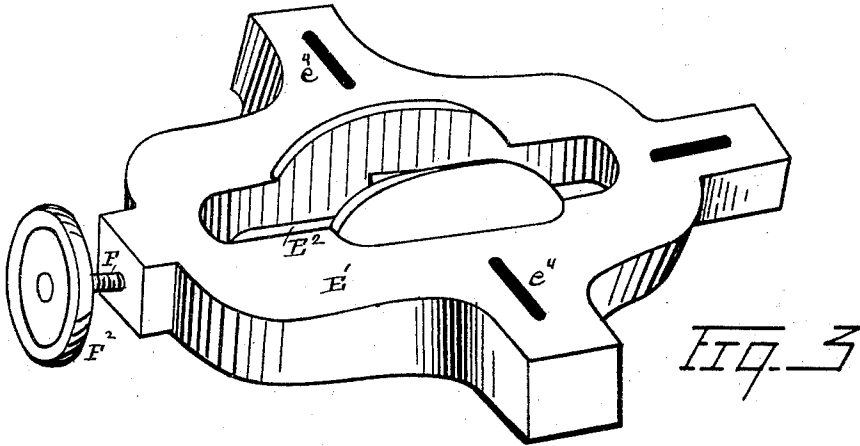
(No Model.)

3 Sheets—Sheet 3.

M. MORTON.  
KEY SEAT CUTTING MACHINE.

No. 468,072.

Patented Feb. 2, 1892.



Witnesses  
John Schuman  
John F. Miller.

Inventor  
Matthew Morton  
By his Attorney  
Newell S. Wright.

# UNITED STATES PATENT OFFICE.

MATTHEW MORTON, OF ROMEO, MICHIGAN.

## KEY-SEAT-CUTTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 468,072, dated February 2, 1892.

Application filed October 18, 1890. Serial No. 368,586. (No model.)

*To all whom it may concern:*

Be it known that I, MATTHEW MORTON, a citizen of the United States, residing at Romeo, county of Macomb, State of Michigan, have invented a certain new and useful Improvement in Key-Seat-Cutting Machines; and I declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to certain new and useful improvements in key-seat-cutting machines, and has for its objects, chiefly, certain improvements in the cutter-bar and in a chuck to get a thrust-bearing thereupon to thrust the cutter-bar to its work, all as more fully herein-after described and claimed, and illustrated in the accompanying drawings, in which—

Figure 1 is a vertical section illustrating features of my invention. Fig. 2 is a similar section at right angles to the former. Fig. 3 is a separate view, in perspective, of the chuck, looking toward the upper side. Fig. 4 is an inverted plan view of the chuck, the binding jaws and arm being removed. Fig. 5 is a side elevation showing parts in section. Fig. 6 is a side elevation showing parts in section and designed more particularly to illustrate a suitable driving mechanism to actuate the cutter-bar.

The purpose of my invention relates particularly to a key-seat-cutting machine for cutting through deep-chambered hubs and for analogous work—such, for example, as drums for elevators, double-armed pulleys, printing-press cylinders, and the like.

The machine for driving the cutter-bar may consist of any suitable mechanism—as, for instance, such as is embodied in Letters Patent of the United States granted to me on the 22d of November, A. D. 1887, features of which are herewith illustrated. I do not, however, in this specification confine myself to any particular driving mechanism.

I carry out my invention as follows: A represents the bed of the machine; B, the work in which the key-seat is to be cut, having a chambered hub B' and arms B<sup>2</sup> and B<sup>3</sup>, through which arms the keyway is to be made.

C is my improved cutter-bar passing through the cross-head D and suitably engaged therewith.

When the work is placed upon the bed or table, the keyway may be first cut through the lower end or arm of the hub in the usual manner. When this keyway has been cut through the lower end, as above mentioned, in the usual manner, my invention contemplates raising the cutter-bar by any suitable means to the required height to cut the keyway through the upper part of the work. When so raised, it will be very evident that there will be need of stiffening or holding the upper part of the cutter-bar to prevent its springing and thrust it firmly and securely to the work in cutting. This is one of the objects which my invention is intended and adapted to secure in addition to improvements in the cutter-bar itself.

As regards the cutter-bar, my invention contemplates the extension of its upper end, above the cutter-blade C', as shown at C<sup>2</sup>, to form a bearing-surface of desired length, whereby the upper end may be guided, forced forward, and held to the work, as illustrated in the drawings. It will be observed, as shown in the drawings, that the front portion of the upwardly-extended end of the bar, above the cutter-blade, is recessed or set back from the front plane of the bar at the point where the cutter-blade is engaged therewith. This dropping away of the bar thus, above the cutter-blade, allows the cutter to do its work in the lower portion of a chambered hub first, and then to be raised to cut the upper portion of the hub. Without this recession on the front surface of the extended end of the bar this work in the lower portion of the hub could not be done by the cutter-bar. For example, take a chambered hub of forty-four inches, where the chamber is eight inches and the hub is eighteen inches on each side of the chamber. It is evident that if the front of the upwardly-extended end, which reaches into the upper portion of the hub, was flush with the face of the bar where the cutter is engaged therewith the cutter could not be forced forward sufficiently to complete the desired cut, as the upper end would strike against the hub in such

a case and prevent the desired depth of cut. This construction, therefore, which is believed to be a new departure in cutter-bars, enables the operator with the same cutter-bar to cut the lower part of the hub, then, by raising the bar, to cut the upper portion thereof also. The extreme upper end may also be provided with a hook *c* or analogous device whereby a tackle may be readily engaged with the cutter-bar to raise it, as above described. I, moreover contemplate providing the cutter-bar with a projecting stiffening-rib *c'*, constructed to enter the keyway as it is being cut. With such a rib additional strength is given to the bar, and it is unnecessary to project the cutter-blade so far outward as would otherwise be required. The bar is cut away beneath the cutter-blade, as shown at *c''*. Immediately below the cut-away portion at *c''* I prefer to form the adjacent portion of the rib *c'* of a hardened removable strip of metal *c'''*, as the wear at this point may render it desirable to replace said strip with a new one, enabling the bar to be readily repaired as wear may render it necessary. These ribs also serve to guide the cutter-bar, as will presently appear.

To effect a firm engagement of the cutter-blade in the socket *c''* of the bar, I contemplate also cutting away the under surface of the blade at the rear end, the set-screw *D* thereby getting a firmer binding of the blade in the socket. It will be observed that by this cutting away of the cutter-blade the point directly in front of the cut-away portion, as at *x*, Fig. 5, constitutes a fulcrum, upon which the blade may tilt slightly as the set-screw is engaged thereupon, the set-screw bearing thereon at the rear of the fulcrum, causing the forward end of the blade to tilt upward into firm engagement with the upper surface of the socket. It is obvious that if the blade were not cut away on its rear lower surface thus the set-screw would force the entire blade upon the lower surface of the socket and away from the upper surface, so that the strain upon the cutter-blade in the downward cut would come entirely or chiefly upon the set-screws, whereas by this construction the strain is directly imparted to the cutter-bar.

To thrust and hold the upper end of the cutter-bar to the work when raised, as above set forth, I employ a chuck *E*, engaged upon the upper portion of the work. This chuck consists, essentially, of a yoke *E'*, provided with sliding jaws *e e'* to be set in any given position, so that the depending ends of said jaws will engage against the inner periphery of the hub or other work and hold the yoke firmly in place. An elongated slot *E''* in the yoke allows the free passage of the cutter-bar therethrough. Through the yoke, also, is extended a spindle *F*, having a screw-threaded engagement therein, said spindle being provided with a bearing-block or head *F'* at one end and an operating hand-wheel *F''* at the other,

said block being intended to bear against the cutter-bar and force it to its work. The yoke is also preferably provided with an additional arm *e''*, having a sliding movement in the yoke and constructed to be set at any desired point, said arm having in connection therewith a bearing-screw *e'''*, to be adjusted against the outside of the work to assist in holding the yoke firmly in place and relieve some of the strain from the jaws *e e'*. To effect the sliding movement of the jaws and arm in the yoke the yoke is provided with suitable ways to receive said jaws and arm, respectively, as shown at *e''*, the face of the yoke being provided with elongated slots *e'''*, communicating into said ways, through which a shoulder of the jaws or arm may be projected, as shown at *e'''*, and set in place by a nut *e''''*.

The operation of the device is as follows: The cutter-bar being elevated, ready for its downward and cutting stroke, is forced forward by means of the screw-threaded spindle *F* until the rib *c'* touches the work, the cutter-blade being projected beyond the plane of the rib the distance of the desired cut. The backing afforded by the spindle and its head bearing against the cutter-bar effectually prevents its springing or yielding and holds it firmly to the work. When the limit of the downward stroke is reached, the pressure against the cutter-bar may be relieved by a reverse movement of said spindle, when the said bar may readily be raised again for another cut. By providing a suitable pit beneath the machine the cutter-bar may readily be given any desired stroke to cut a keyway of any required length. Thus the machine can cut to its full capacity at the lower end of the work and also to its full capacity at the upper end thereof.

It will be seen that the rib not only strengthens the cutter-bar but at the same time serves to retain the cutter in its proper adjustment with the groove after the first cut has been made and the cutter raised above the work to again descend. Thus when it is again forced down to make the second cut it is in proper line with the groove made by the previous downstroke and which is desired to be made deeper, and all tendency of the bar to twist or wobble is entirely overcome, thus to a high degree increasing the efficiency of the machine. The rib is extended downward directly from the cut-away portion *c''*, below the cutter-blade. The body of the cutter-bar, it is evident, is of too great dimensions to enter the kerf of the blade. The rib, being narrower, however, is enabled to enter the keyway as it is being cut. The bars ordinarily employed are about two and one-fourth inches in lateral thickness, while the rib may be as thick as required. One of the greatest advantages, moreover, of the provision of the rib is that it limits the depth of each cut of the cutter-blades while allowing, also, the blade to be set up snug to the work, and pro-

jecting beyond the rib during the whole operation but the small fraction of an inch, the blade needs no further adjustment to do its completed work. Thus at each stroke when  
5 the bar has been duly raised the rib is set up to the inner face of the cut, which always limits with exactness the depth of the cut to follow in the downward stroke of the bar.

What I claim as my invention is—

10 1. In a key-seat-cutting machine, the combination, with a cutter-bar, of a chuck consisting of a yoke slotted to admit said bar and provided with a series of smaller slots, adjustable jaws having downwardly-extending  
15 portions to engage the bore of the work, and shoulders projecting upward through said slots and provided with tightening-nuts, and a sliding head F' for forcing the cutter-bar to the work, the said chuck provided with  
20 guide-flanges for said jaws and head, substantially as described.

2. A cutter-bar provided with a cutter-blade and having its upper end extended above the cutter-blade for the purpose described, the front of said extended upper end  
25 recessed or set back above the cutter-blade

to the rear of the plane of the front of said bar at the base of the projecting portion of the cutter-blade, substantially as set forth.

3. A cutter-bar provided with a socket, a  
30 removable cutter-blade located in said socket and cut away on its rear lower surface to form a fulcrum, and a set-screw located in the cutter-bar, bearing upon the upper surface of the cutter-blade to the rear of the fulcrum,  
35 substantially as described.

4. A cutter-bar provided with a cutter-blade and cut away, as at c<sup>2</sup>, beneath the blade, said bar constructed with a rib on the same  
40 side as the blade, said rib projecting from immediate adjacency to said cut-away portion beneath the blade, and said bar extended above the cutter-blade and recessed or set  
back adjacent thereto, substantially as described.

45 In testimony whereof I sign this specification in the presence of two witnesses.

MATTHEW MORTON.

Witnesses:

N. S. WRIGHT,  
JOHN F. MILLER.