W. F. BILLINGS.

KEY CUTTING MACHINE.

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943,806.

Patented Dec. 21, 1909.

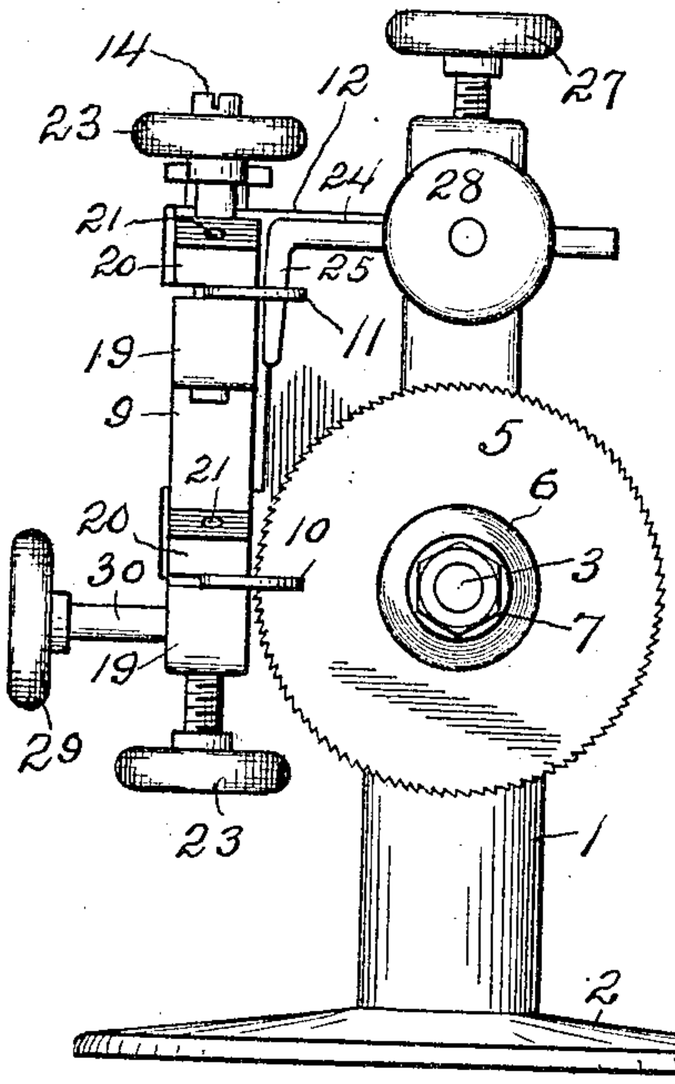


Fig 1

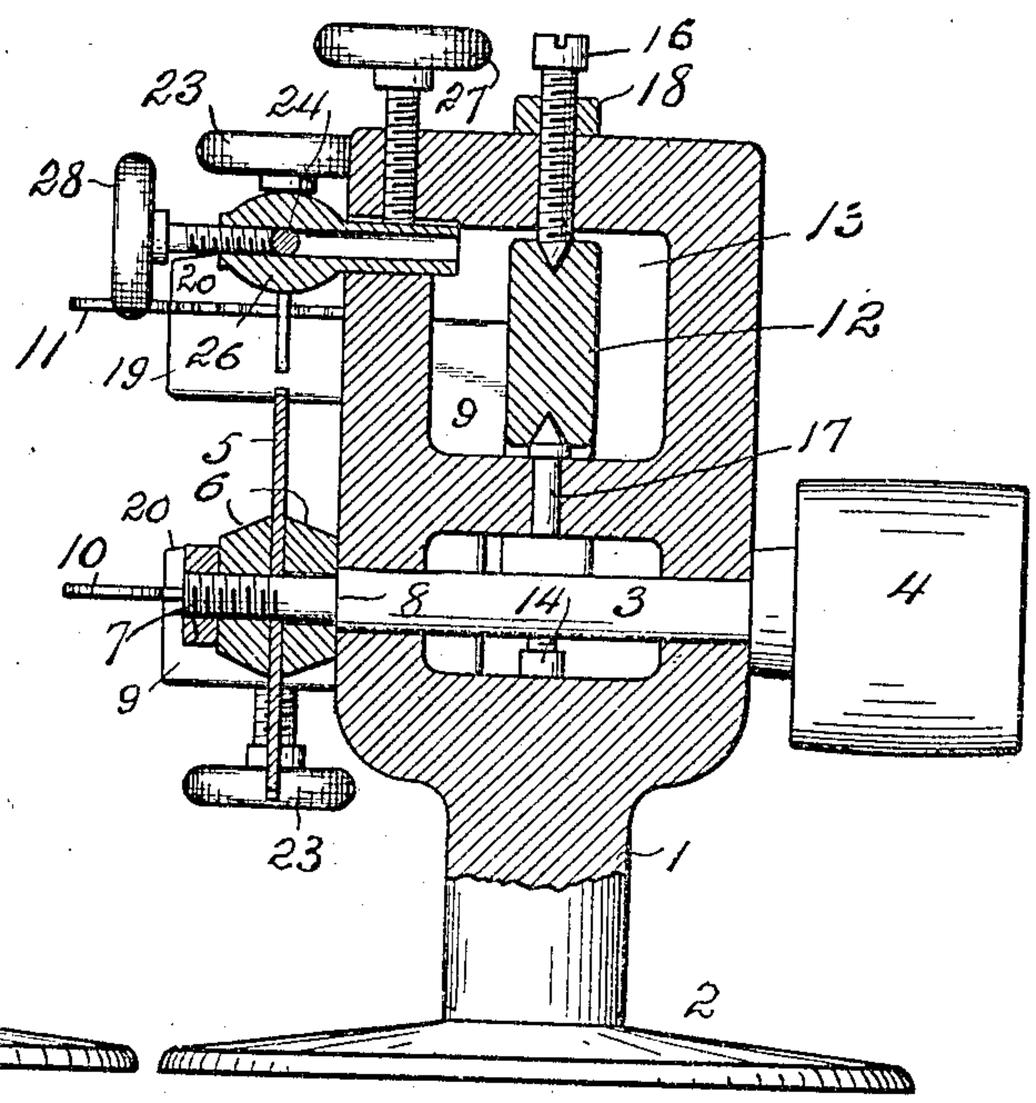


Fig 2

Fig 3

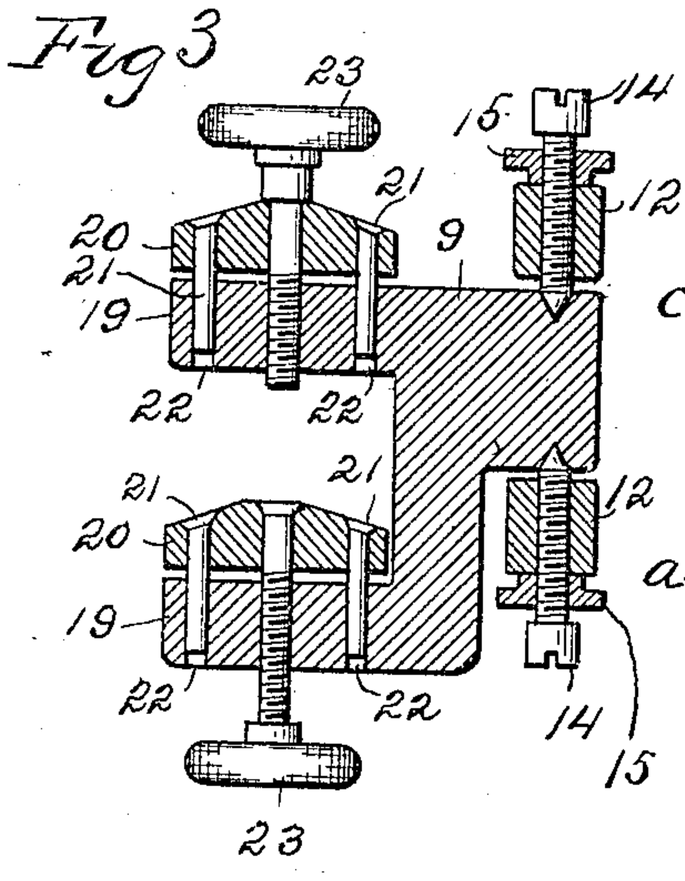
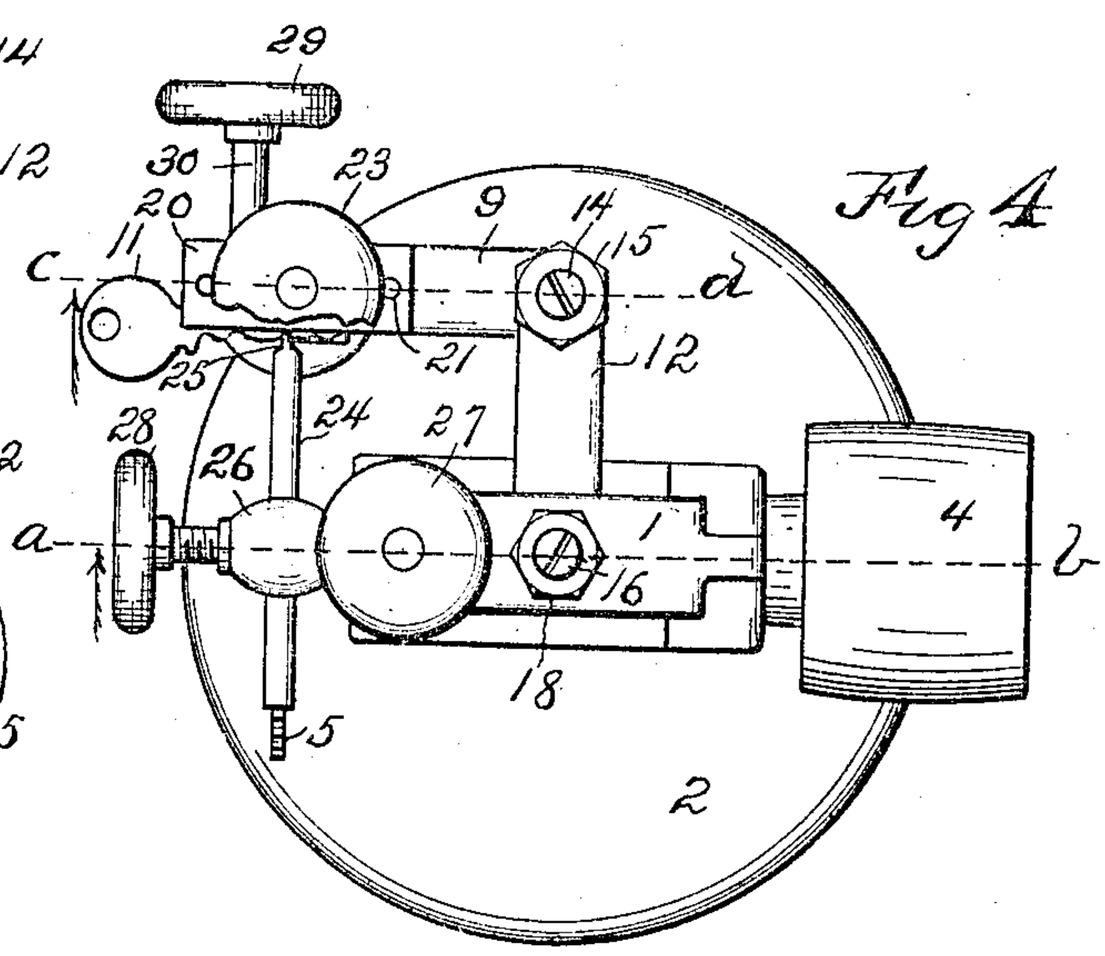


Fig 4



WITNESSES:

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KEY-CUTTING MACHINE.

943,806. Specification of Letters Patent. **Patented Dec. 21, 1909.**

Application filed March 16, 1908. Serial No. 421,349.

To all whom it may concern:

Be it known that I, WILLIAM F. BILLINGS, a citizen of the United States, residing at Kansas City, in the county of Jackson and State of Missouri, have invented certain new and useful Improvements in Key-Cutting Machines, of which the following is a specification.

My invention relates to improvements in key cutting machines.

The object of my invention is to provide a machine by which key blanks may be quickly and accurately cut or notched to correspond with pattern keys it is desired to duplicate.

The novel features of my invention are hereinafter fully described and claimed.

In the accompanying drawings which illustrate my invention—Figure 1 is an elevation view of the machine. Fig. 2 is a vertical sectional view taken on the dotted line *a*—*b* of Fig. 4. Fig. 3 is a vertical sectional view taken on the dotted line *c*—*d* of Fig. 4. Fig. 4 is a plan view, a portion of one of the clamping screws being broken away.

Similar characters of reference denote similar parts.

The vertical stand 1 is provided with a flat base 2 and has rotatively mounted in it a horizontal cutter shaft 3, to one end of which is secured the driving pulley 4. To the other end of the shaft 3 is secured the cutter, the preferable form of which is a circular saw 5 provided with a central hole through which extends the shaft 3. The saw may be secured to the shaft in any desired manner. In the form shown, the saw is shown clamped between two circular plates 6 disposed on opposite sides of the saw and fitted upon the screw threaded shouldered end of the shaft 3. A nut 7, mounted on the screw threaded end of the shaft 3, serves to force the plates 6 against the saw 5 and to tightly force the inner plate 6 against the shoulder 8 on the shaft 3.

A vertical plate 9 serves as a support for the key blank 10 and pattern key 11. The support 9 is pivoted at one end to a vertical plate 12 which in turn is pivoted in a transverse opening in the post 1. This opening is denoted by the numeral 13. The outer end of the plate 12 is bifurcated, the two arms thereof being disposed respectively above and below the plate 9. Through said two arms are provided vertical screw threaded holes in which are fitted respectively two pivot pins 14, the pointed ends of which are mounted in conical recesses in the upper and lower edges of the plate 9. Lock nuts 15 are mounted on the screws 14 and are adapted to engage the two horizontal arms of the plate 12 to secure said screws in the positions to which they may be adjusted. The other end of the plate 12 is pivoted upon the conical ends of a vertical screw 16 and a vertical pin 17. The pin 17 is mounted in a vertical hole in the central portion of the post 1 and at the lower side of the opening 13. The upper end of the pin 17 and the lower end of the screw 16 are fitted in conical recesses provided in the upper and lower edges of the plate 12. The screw 16 is fitted in a screw threaded vertical hole in the upper end of the post 1 and has mounted on it a lock nut 18 adapted to clamp the upper end of the post 1.

The key support 9 is provided with two parallel horizontal arms 19, disposed one above the other. Upon each arm 19 is mounted a clamping plate 20, to which are secured two vertical pins 21, which are vertically slidable in vertical holes 22, provided in each arm 19. The clamping plates 20 are adjusted toward and from the arms 19 by the thumb screws 23 which are rotatively mounted respectively in the plates 20 and have their screw threaded portions respectively fitted in vertical screw threaded holes provided in the arms 19.

The guiding mechanism comprises preferably the following parts: A horizontal rod 24, provided at one end with a downwardly turned finger 25, is slidable lengthwise in a horizontal hole provided transversely through a rod 26 which is horizontally and slidably mounted in a hole provided in the post 1. The rod 26 is disposed above and parallel with the shaft 3 and is retained in the position to which it may be adjusted by a vertical set screw 27, fitted in a screw threaded hole in the post 1. The rod 26 is provided with a screw threaded hole extending lengthwise in the said rod, said hole being intersected by the rod 24. A set screw 28 is fitted in the last named threaded hole and bears against the guide rod 24 for the purpose of retaining said guide rod in the positions to which it may be adjusted.

In the operation of my invention the key blank 10 is placed upon the lower arm 19 and secured thereon with the edge to be cut disposed adjacent to the saw 5. The lower

screw 23 is then turned so as to clamp the lower plate 20 against the upper side of the key blank 10.

The pattern key 11 is clamped in a like manner between the upper side of the upper arm 19 and the upper plate 20. The guide rod 24 is preferably adjusted to a position in which the finger 25 will be disposed in the same vertical plane as the saw 5. The relative disposition of the pattern key 11, key blank 10, finger 25 and saw 5, is such that the notches cut by the saw in the key blank will be in the proper places. This disposition of the parts may be obtained by longitudinal adjustment of the rods 24 and 26, or by properly positioning the key blank relative to the pattern key upon the key support.

After the pattern key and key blank have been secured in position and the rod 24 has been properly positioned, the pulley 4 is rotated by any suitable driving means, thereby rotating the saw 5 through the intermediacy of its supporting shaft 3. The plate 9 has secured to it a horizontal rod 30 provided with a circular head 29 which serves as a hand hold for swinging the plates 9 and 12. By properly moving the plates 9 and 12 by means of this hand hold the guide finger 25 may be made to follow the contour of the adjacent edge of the pattern key 11. While this is being done the saw 5 will cut a corresponding contour upon the adjacent edge of the key blank 10, thereby producing a key from said blank which is a duplicate of the pattern key in so far as the notched edge of the key is concerned.

I am aware that carving machines for cutting contours have been devised in which the pattern and work support is pivoted to two parallel links of even length, the links in turn being pivoted to another support. In such machines, however, accessory means must be provided to enable the pattern support being moved in a manner such that contours may be cut in the work, as without such accessory means a point on the pattern support would travel only in the arc of a circle, and, therefore, only arcuate lines could be cut in the work. With the employment of but a single link pivoted to the stand and to the key and pattern support, such as embodied in my improved machine, a point on the key support will travel parallel with or transverse to the axis of the cutter, so that without any accessory means the work may be moved in any direction in a single plane for the cutting of a desired contour.

It is obvious that my invention may be subjected to many modifications within the scope of the appended claim without departing from its spirit.

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

In a key cutting machine, the combination with a stand, of a cutter shaft rotatively mounted thereon, a cutter carried by said shaft, a link pivoted to said stand so as to swing in a plane parallel with said shaft, a key support pivoted to said link so as to swing in a plane parallel to said shaft, said key support being adapted to support a pattern key and a key blank, two clamping devices carried by said key support for securing thereto a pattern key and a key blank, a rod adjustable lengthwise on said stand parallel with said shaft, and a guide adjustable on said rod transversely to said shaft for coöperating with the pattern key.

In testimony whereof I have signed my name to this specification in presence of two subscribing witnesses.

WILLIAM F. BILLINGS.

Witnesses:
E. B. House,
R. E. Hamilton.