H. TUCKER.

KEY DUPLICATING MACHINE.

APPLICATION FILED OCT. 29, 1912.

1,081,471.

Patented Dec. 16, 1913.

2 SHEETS—SHEET 1.

Fig. 1.

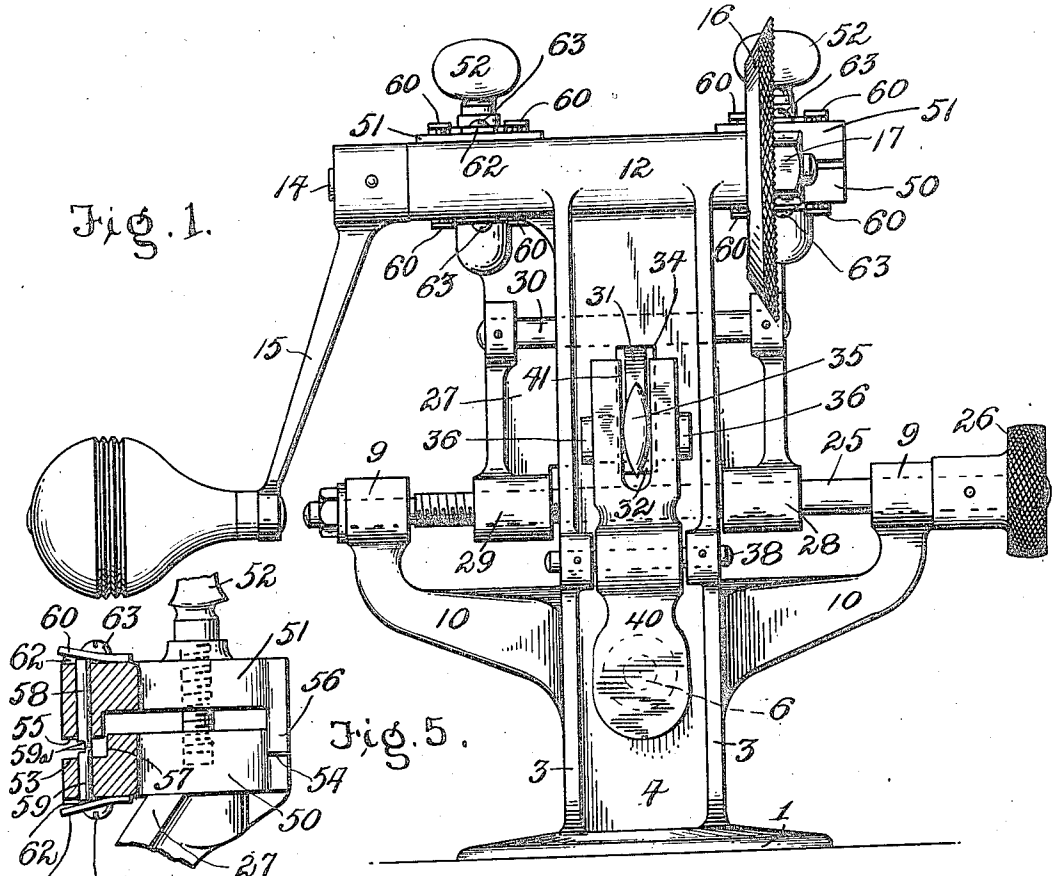


Fig. 5.

Fig. 6.

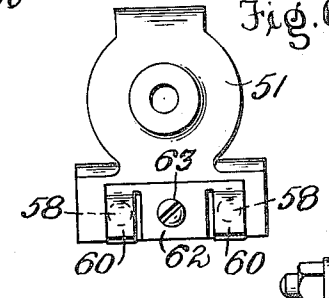


Fig. 2.

WITNESSES

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2 SHEETS—SHEET 2.

Fig. 3.

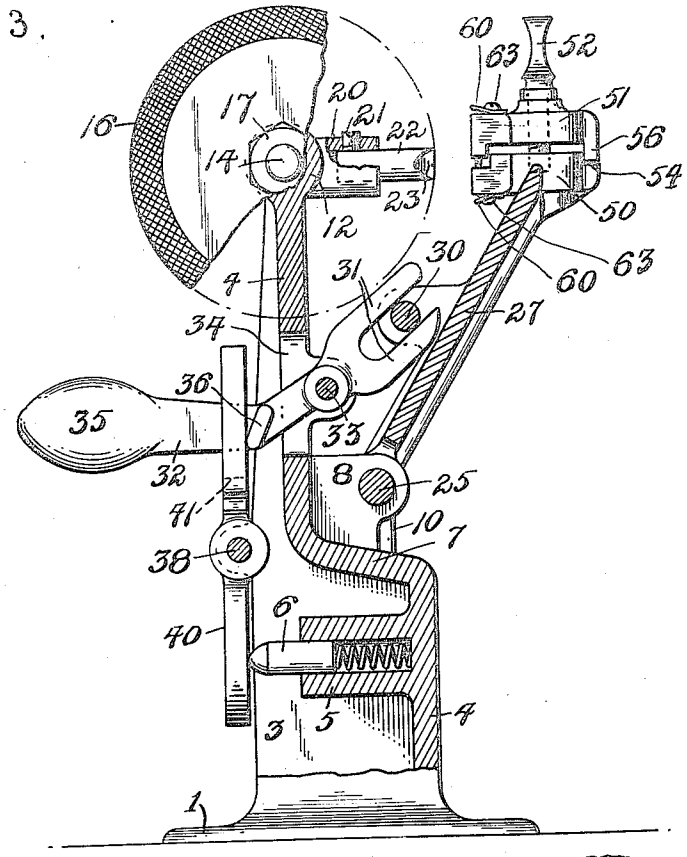


Fig. 4.

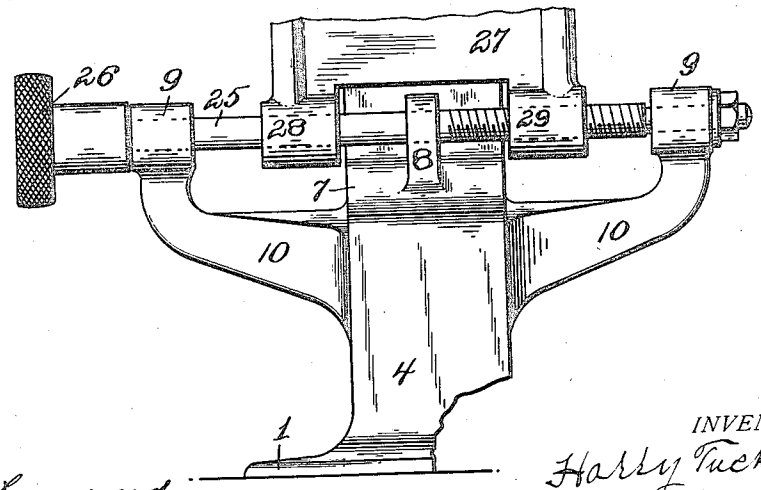
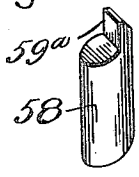


Fig. 7.



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KEY-DUPLICATING MACHINE.

1,081,471. Specification of Letters Patent. Patented Dec. 16, 1913.

Application filed October 29, 1912. Serial No. 728,396.

To all whom it may concern:

Be it known that I, HARRY TUCKER, subject of the Czar of Russia, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Key-Duplicating Machines, of which the following is a specification.

The object of this invention is to provide a machine for automatically duplicating keys of the Yale type, and broadly it consists in means for moving the active edge of a pattern key over a tracer and for imparting corresponding movements to the key-blank while a rotary cutter is operating on the latter to impart a shape thereto corresponding to the shape of the active edge of the pattern key.

Other objects and details of construction will be particularly pointed out in the following description, given with reference to the accompanying drawings forming a part of this specification and wherein like numerals of reference designate corresponding parts throughout the several views.

In the drawings: Figure 1 is a side elevation, Fig. 2 is a top plan view of a fragment of the machine, Fig. 3 is a vertical section taken on an irregular line, Fig. 4 is a side elevation of a fragment of the machine, viewed from the opposite side of Fig. 1, Fig. 5 is an elevation of the work holding jaws partly broken away, Fig. 6 is a top plan view thereof, and Fig. 7 is a perspective view of one of the work gripping teeth of the jaws.

Referring to the drawing, it will be noted that the main frame of the machine consists of a base 1, a standard thereon comprising side walls 3 and main wall 4, housing 5 cast with the main wall and containing a spring pressed plunger 6, off-set portion 7 and bearing ear 8. In the same plane with the said bearing ear 8 are bearings 9 carried by arms 10 which extend from opposite sides of the standard. At the upper end of the standard is formed a bearing head 12 in which is journaled an operating shaft 14, having a hand crank 15 fixed to one end and a rotary cutter 16 secured to the other end by means of a nut 17. The outer face of the cutter 16 is flat and the rear face beveled adjacent its outer edge, and the peripheral portions of these faces are given a file-like cutting surface for the purpose of shaping the active or essential edge of the key blank. At the end of the head 12 opposite that end which has the cutter, extends an arm 20 in which is adjustably secured by a set screw 21 a tracer 22. The latter has a knife edge 23 which forms the tracing portion. It will be noted that the tracer and its housing arm 20 extend at right angles to the bearing 12 and that the tracer edge 23 and cutting edge of the cutter 16 are in parallel alinement with the axis of the said head. Journaled in the said bearings 8 and 9 is a feeding shaft or screw 25, one end only of which is threaded. A thumb nut 26 is fixed to the said shaft or screw 25 whereby the same may be turned by hand. A plate 27, which carries the key and key-blank holders, is provided with bearings 28 and 29, the former being of smooth bore and the latter having a threaded bore, and through the bore of these bearings 28 and 29 extends the said feeding shaft or screw, the threaded portion of the latter co-acting with the threaded bearing 29 to cause the said plate 27 to be moved longitudinally of the shaft or screw 25. The bearings 28 and 29 are spaced apart and each travels in the space between the central standard bearing 8 and one of the bearings 9.

In addition to the longitudinal movement of the plate 27 along the shaft or screw 25, it has a pivotal or swinging movement thereon. Secured to the inner face of the plate 27 is a guide rod 30, spaced from the plate, and in parallel relation to the feeding shaft or screw 25. This guide rod is received in the crotch of the forked end 31 of a hand lever 32, the latter being pivoted on a rod 33 which extends across an opening 34 in the main wall 4 of the standard, and through which opening the hand lever

passes. Between the pivotal point and the handle 35 of this lever and on opposite sides thereof are alined projections 36. Pivoted to the rod 38 extending from one side wall 3 to the other of the standard, is a pressure lever 40, the upper end of which is slotted and receives in said slot, as indicated by numeral 41, the said hand lever 32. The said projections 36 bear against the branches of the lever 40 formed by the said slot 41. The lower end of this pressure lever is spring pressed by the previously described plunger 6.

At each side of its upper ends, the plate 27 is provided with work holding clamps, the one at the cutter end of the machine serving to hold the key-blank to be cut, and the one adjacent the tracer end of the machine holding the pattern key. These clamps are identical in structure and description of one will therefore serve for the other. Each clamp is composed of two sections 50 and 51, the former being integral with the plate 27 and the latter separate therefrom though attached to the section 50 by means of a thumb screw 52. The section 50 has front and rear depressions 53 and 54 respectively and the upper section 51 has projections or flanges 55 and 56 respectively in the front and rear thereof. The projection or flange 55 of the upper jaw 51 coöperates with the depressed portion 53 of the other jaw 50 and forms therewith the gripping surfaces of the clamp, the wall portion 57 forming an abutment for the work. Extending transversely through the jaws in a vertical plane are upper and lower teeth 58 and 59 respectively which are slidingly arranged in the jaws and capable of rotation, whereby their biting edges 59^a, (seen in Fig. 7) may be turned to various positions. When the jaws are tightened upon a key or key-blank, the teeth 58 and 59 bite thereinto slightly due to the pressure of the springs 60 applied to the upper and lower surfaces of the upper and lower jaw sections. These springs are formed by slitting a spring plate partially at two points, the portion intermediate the slits forming the attaching portion 62 (see Fig. 6), being secured in place by a screw 63. In some instances, the teeth grip the plain sides of the key or blank, while in other cases, their biting edges 59^a are turned to engage in the usual groove found in this style of key.

In operation, the pattern key A is clamped in its holder and the key blank B in the other holder, as seen in Fig. 2. The crank is then turned to rotate the cutter, and the handle 35 of the lever 32 depressed to bring the active edges of the key and blank into engagement with the tracer 22 and cutter 16. Upon the projections 36 passing a certain point, the pressure of the spring plunger 6 holds the key and key-blank mechanism against the tracer and cutter permitting a certain amount of motion of the latter toward and from the tracer and cutter. While thus engaged with the tracer and cutter, the key and blank are moved longitudinally along the same by means of the feeding shaft or screw 25, which latter causes corresponding movement of the plate 27 and the work holders. As this plate 27 moves along the shaft or screw 25, the rod 30 moves longitudinally within the forked pressure lever 32, and from this it will be observed that the pressure of said lever is effectually exerted upon the plate 27 in all positions which the latter may assume in its longitudinal travel along the feed shaft or screw 25. Likewise, at any of the said points in the said longitudinal travel of the plate, the pressure lever 32 may effectually act to remove the key and blank from engagement with the tracer and cutter upon raising the handle 35 of the said lever 32 and thereby forcing the plate 27 outwardly until the projections 36 are in a position to resist the spring action of the lever 40. As the pattern key moves over the tracer, the key-blank has imparted thereto all of the movements of the pattern key, which results in the key-blank being cut to the same shape as the pattern key. One side of the cutter being flat, the straight edge of the key blank adjacent the shoulder X may be cut perfectly.

Having fully described the invention, what is claimed as new and useful and desired to be secured by Letters Patent is:—

1. In a device of the character described, a standard, a tracer and cutter thereon, key and key-blank holding means slidingly pivoted in the standard, a guide member carried by said means, a forked lever slidingly engaged therewith, and spring pressure means engaged with said lever.

2. In a device of the character described, a standard, a horizontal feed screw thereon, a tracer and cutter horizontally alined with respect to the feed screw, key and key-blank holding means movable along the screw and having pivotal movement thereon toward and from the tracer and cutter, a guide member on the said means extending in parallelism with the feed screw, a forked lever slidingly engaged with said guide member, and a spring lever engaged with the forked lever.

3. In a device of the character described, a standard, a horizontal feed screw thereon, a tracer and cutter horizontally alined with respect to the feed screw, key and key blank holding means movable along the screw and having pivotal movement there-

on toward and from the tracer and cutter, a guide member on the said means extending in parallelism with the feed screw, a forked lever pivoted in the standard and being slidingly engaged with said guide member at the fork end and at the other end being provided with projections, and a spring pressed lever provided with a slot receiving said forked lever and engaged with the said projections.

In testimony whereof I affix my signature in presence of two witnesses.

HARRY TUCKER.

Witnesses:

J. LOUIS BARRICK,

M. E. TAYLOR.