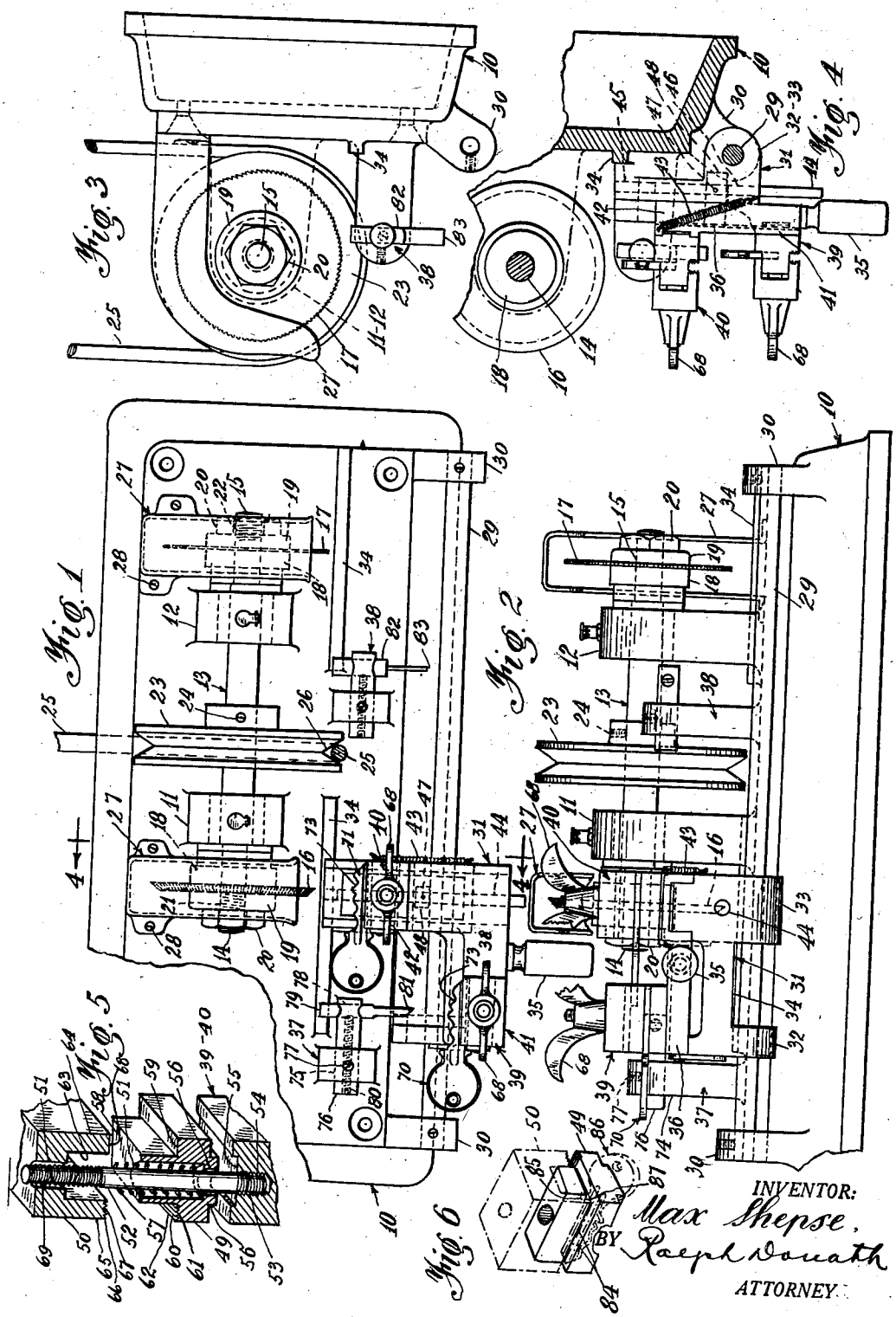
July 25, 1939. M. SHEPSE 2,167,008

KEY DUPLICATING MACHINE

Filed Oct. 29, 1937



Patented July 25, 1939

2,167,008

UNITED STATES PATENT OFFICE

2,167,008

KEY DUPLICATING MACHINE

Max Shepse, Pittsburgh, Pa.

Application October 29, 1937, Serial No. 171,661

1 Claim. (Cl. 90—13.05)

This invention relates to improvements in machines adapted to cut duplicate keys from existing keys.

The main object of this invention is to provide a compact, small and inexpensive machine by means of which any standard type of key may be cut, such as for instance, cylinder keys, flat keys or malleable keys, without skillful handling.

Another object of the invention is to provide a machine in which the key carriage is moved toward the cutting wheel in a horizontal plane, instead of swinging the same about a pivot, thus a more accurate notching of the key is obtained.

Yet another object of the invention is to provide a duplicate key cutting machine having a movable carriage with a slidable frame thereon on which are mounted a pair of reversible vises, one to hold a template key and one to hold the key to be duplicated, the vise which holds the latter being mounted on said frame in close proximity of the cutting tool, whereas the vise which holds the template key is mounted side-ways and rearwardly thereof.

Still another object of the invention is to provide a duplicate key cutting machine with a pair of reversible vises which are adapted to hold flat or malleable keys.

Another object of the invention is to provide a duplicate key cutting machine which is very simple in construction and therefore inexpensive to produce and yet one which will be exceedingly effective for the purpose for which it is designed.

Other objects of the invention will become apparent as the detailed description thereof proceeds.

In the drawing wherein like numerals of reference designate corresponding parts throughout the several views,

Figure 1 is a top plan view of the complete device, a corner of the base being broken away.

Figure 2 is a front elevation of Figure 1.

Figure 3 is an end elevation of Figure 1, the carriage being eliminated.

Figure 4 is a fragmentary sectional view along line 4—4 in Figure 1 showing the details of the carriage.

Figure 5 is a perspective, sectional exploded view of one of the vises as used in the invention.

Figure 6 is a perspective view of parts of a vise, showing one of the shoulders of a cylinder key inserted in a slot of the lower block of the vise.

In general, the device comprises a base 10, having a pair of integral upright bearing posts 11 and 12 in which is rotatably journaled a shaft 13 which is slightly reduced in diameter and is extended beyond said posts 11 and 12 and indicated by the numerals 14 and 15. Shaft extension 14 carries a beveled cutting wheel 16 and shaft extension 15 carries a saw-like cutting tool 17 secured thereto. Said cutting wheel 16 and said sawing tool 17 are mounted between a stepped off cylindrical sleeve 18 and a common sleeve 19 and each is frictionally held from rotating on said shaft extensions by means of a threaded nut 20 which engages the threaded ends 21 and 22 of said shaft extensions 14 and 15.

A grooved pulley 23, of ordinary design, is mounted between said bearing posts 11 and 12 and securely held in position on said shaft 13 by means of a set screw 24, whereby said pulley may be rotated by a belt 25 in the groove 26 thereof and driven by an electric motor or other suitable means, thereby rotating said beveled cutting wheel and said saw-like tool 16 and 17 respectively.

To protect the operator from possible injury both tools are provided with suitable guards 27 secured to the base 10 by screws 28.

In parallel alignment with said shaft 13 and extending outwardly from said base 10 is a stationary carriage guide rod 29 which is supported at each end in sockets 30 preferably formed integral with said base 10.

A carriage 31, the front of which is slidably supported on said guide-rod 29 by a pair of depending lugs 32 and 33 and the rear of which rests on a supporting strip 34 which is preferably cast integral with said base 10 and extends in parallel relation with said guide-rod 29, may be moved sideways along said guide-rod 29 by means of a handle 35 which is secured to an angular shaped frame 36 adapted to slide on said carriage 31 toward and away from one of the cutting tools 16, 17, or one of the depth gauges 37, 38.

The aforesaid angular frame 36 is provided with a pair of reversible vises 39 and 40, each of which is mounted on top of the extremities of the legs 41 and 42 of said frame 36 in a manner as shown in Figure 1, that is, the left hand vise 39 is mounted at the end of leg 41 which is in parallel relation with guide rod 29, and the right hand vise 40 is mounted at the end of leg 42 which is 90 degrees from said leg 41. By arranging the said vises 39 and 40 in a manner as heretofore described, long keys, such as for instance one of the malleable type, may be cut con-

veniently without considerably increasing the length and width of the base of the machine. This accomplishment provides considerable reduction in the cost of manufacture and the fact that the device requires only a small space on which the same may be mounted is an additional feature to be considered.

Normally, the said carriage 31 is in a position as best illustrated in Figure 4, in that position the angular frame 36 is shown retained away from the cutting tool 16 by means of a coil spring 43, one end of which is fastened to said frame 36 and the other end of which is secured to the carriage 31, as shown.

In order to limit the movement of said frame 36 foreward or rearward on said carriage 31, there is provided a rod 44, the ends of which are adapted to slide in horizontally disposed apertures 45 and 46 of carriage 31 and this rod 44 is secured by means of a pin 47, or otherwise, to the depending lug 48 of said frame 36. It is this lug 48 which serves as a medium to limit the movement of said frame 36 on said carriage 31.

Referring now to Figure 5 which illustrates an exploded sectional detail view of said vises 39 and 40 as used in this invention, and the same comprises a lower block 49 and an upper block 50 both of which having a vertical and centrally disposed aperture 51 adapted to freely receive a stud 52. As shown, this stud 52 is provided at both ends with threads, the lower end 53 engaging the threaded hole 54 of a recessed portion 55 of said frame 36 arranged in parallel relation to said guide rod 29.

The said lower block 49 is provided with a downwardly extending tongue 56 which fits into said recessed portion 55 of frame 36. The lower end of said aperture 51 which is numbered 56, is slightly reduced, so as to form a seat for a coil spring 57 which is coiled around said stud 52. The top 58 of said lower block 49 has the sides cut down to form horizontal ledges 59 and 60 in which the one indicated by the numeral 60 is provided with gripping grooves 61 to form a jaw 62 for a purpose to be described later. The upper block 50 has the shape of an inverted U-shaped cross-section, comprising a longitudinal groove 63 and elongated legs 64 and 65, leg 65 being provided with longitudinal gripping grooves 66 to form a jaw 67 corresponding to jaw 62 of said lower block 49.

In position, said groove 63 fits over the top portion 58 of said lower block 49 so that the corresponding jaws 62 and 67 and the ledge 59 and the base 68 of leg 64 oppose each other. A wing-nut 68 is screwed down over the threaded upper end 69 of stud 52, thus producing a small vise provided with two oppositely directed gripping jaws, one to securely engage flat keys, such as cylinder keys and flat keys and the other jaws to securely hold malleable keys.

Figures 1, 2 and 4 show the carriage 31, including the angular frame 36 and the vises 39 and 40, at the left side of the base 10, in this position the device is adapted to cut duplicate cylinder keys, as shown. When the said carriage 31 is at the right hand side of said base 10, the device is adapted to make duplicate keys of the flat and malleable type since a different notch cutting tool is required (as shown) for those keys.

Should it be desired to duplicate a flat key, the vises need not be turned around, but they remain in the same position as shown for duplicating cylinder keys.

When duplicating malleable keys, the carriage is moved over to the right of the base, but in this case it is required to turn the vises around, so that the gripping jaws 62 and 67 now face the cutting tool and the corresponding depth gauge.

To turn said vises around it is only required to partly unscrew the wing-nut 68 from stud 52, sufficient to be able to lift with two fingers the lower block 49 out of engagement of the recess 55 of frame 36, turn both, the lower and the upper block around said stud 52 for 180 degrees, release the finger-hold from the blocks which will permit the lower block 49 to again engage with recess 55 of frame 36. In this position, the vises are now adapted to hold malleable keys.

The beveled cutting tool 16 cooperates with a depth-gauge 37, whereas the saw-like cutting tool 17 cooperates with the depth-gauge 38, each of said gauges serve to accurately duplicate the notches of the key.

The depth-gauge 37 comprises a standard 74 preferably cast integral with said base 10, the upper part of said standard is provided with a horizontally disposed bore 75 which is in parallel alignment with guide-rod 29 and adapted to receive an adjustable stub-shaft 76 which is held in the desired position by a set screw 77. Adjacent the right end of said stub-shaft 76 is an aperture 78 in which is adjustably mounted the gauging tool 79 and held in position by a set-screw 80. The end of said gauging tool 79 which faces the template key is flattened and has an angular tip 81.

The depth-gauge 38 is of the same construction as the depth-gauge 37 above described, with the exception, that the gauging tool 82 is considerably more flattened than tool 79 and has a straight tip 83.

In operation, the carriage 31 is tilted downwardly about the guide-rod 29 until the handle 35 by which the device is manipulated contacts the front edge of the workbench (not shown), this enables the operator to conveniently insert the keys (template key and key blank) in the corresponding vises 39 and 40, the template key being inserted in vise 39 and the blank key in vise 40. After both keys have been inserted and securely locked by means of the wing-nut 68 the carriage is again swung back in its normal position and the device is now ready to cut the notches in the key blank.

Assuming, that it is desired to make a duplicate cylinder key, in that case, the carriage 31 is moved to the left hand side of the base 10, as shown in Figures 1, 2 and 4, it is also assumed that the template key 70 is held in place between the flat jaws of vise 39, and the key blank 71 is held in place between the flat jaws of vise 40. In cutting the notches 73, the operator grasps the handle 35 and presses the carriage toward the rotating cutting tool 16, until the tip 81 of the gauging tool 79 contacts the first notch of template key 70. The said carriage 31 is then shifted laterally (right) cutting the second notch, and so forth until the last notch is cut. Of course, it will be understood, that the distance between the edge of the cutting tool to the edge of the blank key must correspond to the distance from the tip of the gauging tool to the edge of the template key.

The notches in flat keys are cut in the same manner as heretofore described, with the exception, that the carriage 31 is shifted to the right hand side of the base.

Keys of the malleable type are also cut at the right hand side of the base, but in this case, the

vises 39 and 40 are turned around, as previously explained, so that the grooved gripping jaws 62 and 67 face the cutting tool 17.

Referring now to Figure 6 of the drawing, there is illustrated in full lines the lower block 49 and in dot and dash lines the upper block 50 of said vises 39 and 40, there is also shown in dot and dash lines a cylinder key held between the jaws of the lower and upper blocks 49 and 50 respectively. As is well known in the art, cylinder keys have corrugated longitudinal flutes or grooves 84 which make it often difficult to retain the keys in the vise, this disadvantage has been fully overcome by inserting the shoulder 85 of key 86 in the transverse undercut 87 of said vise block 49.

The invention herewith illustrated and described is susceptible to many variations in its form, proportions and minor details of construction, and the right is herein reserved to make such changes as properly fall within the scope of the invention.

I claim:

In a key duplicating machine of the kind described, a base, a sliding rod mounted on said base, a single carriage slidably and pivotally mounted on said sliding rod, a frame transversely slidable on said carriage, a pair of reversible vises supported on said frame, one to hold a template key and the other one to hold a key blank, a pair of unlike cutting wheels and a pair of depth gauges for each of said cutting wheels, said single carriage adapted to be selectively brought in alignment with one of said cutting wheels and one of said depth gauges.

MAX SHEPSE.