Oct. 6, 1931. W. HADDOW 1,826,347

DIE LAPPING MACHINE

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Fig. 1.

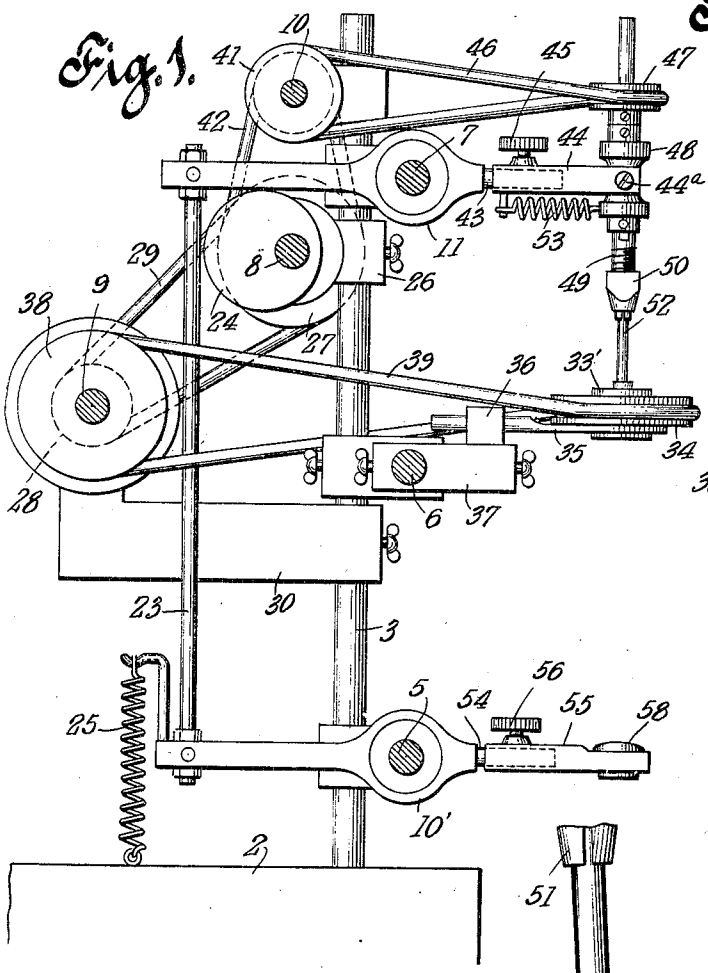


Fig. 2.

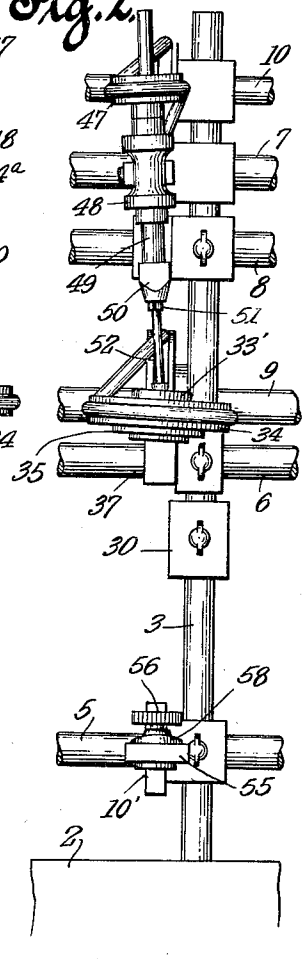


Fig. 3.

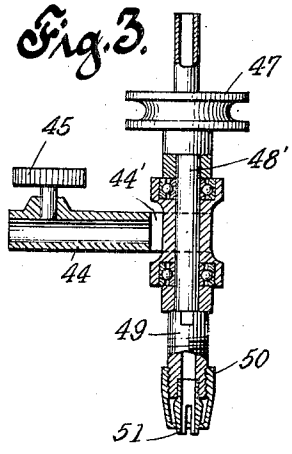
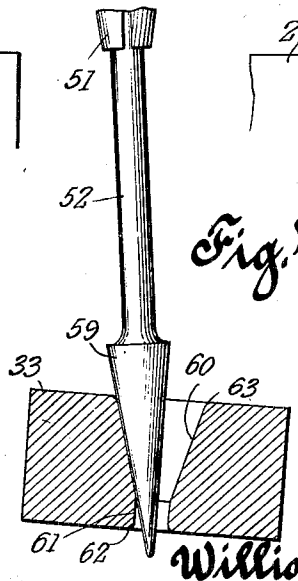


Fig. 4.



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Fig. 5.

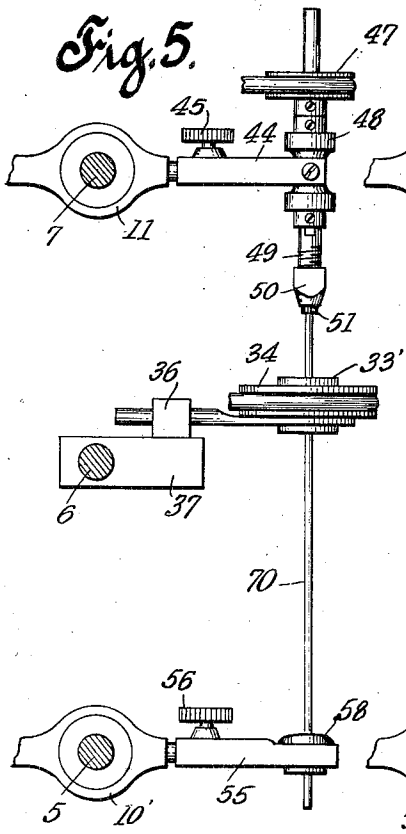


Fig. 7.

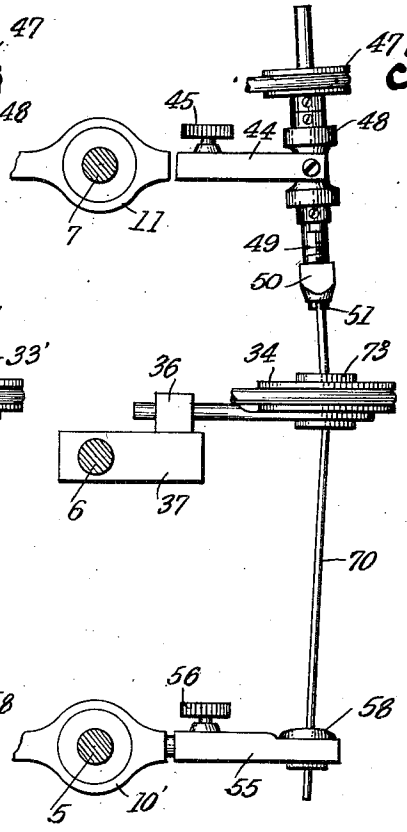


Fig. 8.

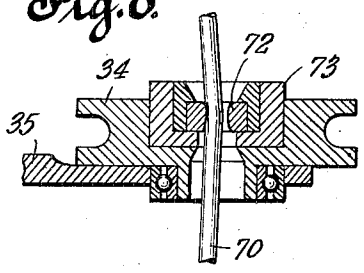
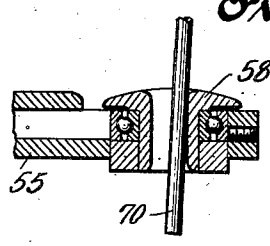


Fig. 6.



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UNITED STATES PATENT OFFICE

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DIE LAPPING MACHINE

Application filed December 23, 1930. Serial No. 504,260.

This invention relates to die lapping machines and more particularly to a machine for sizing wire drawing dies of a hard metal composition.

It is an object of the invention to provide a die lapping machine having a novel head by means of which a reciprocatory movement is imparted to an inclined rod during the lapping operation.

A further object is the provision of a lapping machine of simple construction which may be efficiently operated and readily adjusted for various requirements.

Figure 1 is a side elevation of the lapping machine.

Figure 2 is a front elevation of the lapping machine.

Figure 3 is a sectional view of a head used in the machine.

Figure 4 is an enlarged view, partly in section, illustrating the operation of a lapping rod on a die.

Figure 5 is a side elevational view showing parts of the machine being used to perform another form of lapping.

Figure 6 is a sectional view of a detail of the structure shown in Fig. 5.

Figure 7 is a side elevational view showing parts of the machine being used to perform still another form of lapping.

Figure 8 is a sectional view of a detail of the structure shown in Fig. 7.

Referring to the drawings, the machine may be erected upon a convenient base 2 and is supported by one or more posts such as the post 3. If a single unit is employed, one post 3 is sufficient to support all parts of the unit, but where a plurality of units are assembled in a gang, it is preferable to employ several posts such as post 3, at either end of the gang.

Adjustably supported by the post 3 are horizontal rods 5, 6, 7, and bearings for shafts 8, 9, 10. On rods 5 and 7 are mounted, preferably on anti-friction bearings, levers 10′ and 11 respectively. Lever 11 has one arm 43 adjustably connected by a clamp screw 45 to a tubular extension 44, which has forked extremities 44′ pivotally connected at 44*a* to a head 48, rotatably mounted on a shaft 48′. The shaft 48′ has an enlarged threaded end 49 in engagement with a chuck member 50 and a gripping member 51, in which is held a lapping rod 52, the latter being provided with a conical tip 59 for engaging a die 33 in the manner shown in Fig. 4.

Above the head 48, the shaft 48′ has attached thereto a pulley 47, over which passes a belt 46, which also passes over a pulley 41 mounted on shaft 10. A belt 42 connects pulley 41 with a pulley 27 mounted on shaft 8, and pulley 27 is in turn connected by a belt 29 to a pulley 28 mounted on shaft 9.

The left arms of levers 10′ and 11, (see Fig. 1) are connected by a rod 23, and oscillated against the pull of spring 25, by the engagement of lever 11 with an eccentric or cam 24 mounted on shaft 8.

Shaft 8 turns in bearing 26, adjustably fixed to post 3 and is driven from countershaft 9 as explained above, the shaft 9 being driven by any convenient means.

The die to be lapped may be supported centrally within a die carrying hub 33′ of a pulley 34, according to known practice, and the pulley is supported for rotation in an arm 35 adjustable universally relative to rod 6. The shank of arm 35 is adjustably secured in dog 36, which in turn is adjustably clamped in arm 37 adjustably located on rod 6. Pulley 34 is driven from pulley 38 fixed to countershaft 9 by belt 39.

The right arm 54 of lever 10′ is adjustably connected by means of a clamp 56 to an extension 55 in which is rotatably supported a guide 58.

The head 48 is also connected to the member 44 by means of tension spring 53.

In operation, the lapping rod 52 is rotated by the action of the belt 46, and reciprocated by the oscillation of lever 11. The extension 44 is moved about arm 43 and clamped to tilt the rod 52 from the vertical, as shown in Figs. 2, 4 against the pull of spring 53. At the same time, the die holder 33′ is rotated by the belt 39, and also is tilted from the horizontal in opposition to the tilt of rod 52 as shown in Figs. 2, 4. As shown in Fig. 4, the conical nose 59 of the rod 52 bears constantly against one side of the rotating die

33, and imparts to the latter a smooth conical surface 60. The die is rotated in one direction and the rod 52 is rotated in the opposite direction.

The conical section 60 of the die opens into a cylindrical portion 61 having rounded edges 62. In order to polish the portion 61, a rod 70 is attached to the head 48 and rotated and reciprocated as described above, with the exception that the rod is not tilted from the vertical. The lower portion of the rod is guided by the member 58 as shown in Fig. 5.

In Fig. 8 is shown a different form of die 72, mounted in a die holder 73 on pulley 34 and arm 35. To lap a die of this form, the rod 70, is reciprocated, rotated and tilted as described in connection with rod 52, the lower end of rod 70 being guided by the member 58 on extension 55.

I claim:

1. In a machine of the character described, a tiltably mounted die holder, means for rotating the die holder, a lever, means for oscillating the lever, a lapping rod supported by the lever, the oscillation of the lever imparting a reciprocatory movement to the rod, and means to rotate the rod.

2. In a machine of the character described, a lever, means for oscillating the lever, a lapping rod supported by the lever, the oscillation of the lever imparting a reciprocatory movement to the rod, and means to rotate the rod.

3. In a machine of the character described, a lever, means for oscillating the lever, a lapping rod supported by the lever, the oscillation of the lever imparting a reciprocatory movement to the rod, means to rotate the rod, and means to maintain the rod in a definite tilted position.

4. In a machine of the character described, a lever, means for oscillating the lever, a lapping rod supported by the lever, the oscillation of the lever imparting a reciprocatory movement to the rod, means to rotate the rod, a second lever having means thereon to guide the rod, and means to oscillate said second lever.

5. In a machine of the character described, a tiltably mounted die holder, means for rotating the die holder, a lever, means for oscillating the lever, a lapping rod supported by the lever, said rod having a conical nose, the oscillation of the lever imparting a reciprocatory movement to the rod, means to rotate the rod in a direction opposite to the rotation of the die holder, and means to tilt the rod.

In witness whereof, I hereby affix my signature this 18th day of December, 1930.

WILLIAM HADDOW.