May 30, 1944. T. WILSON 2,349,897

APPARATUS FOR POLISHING WIRE

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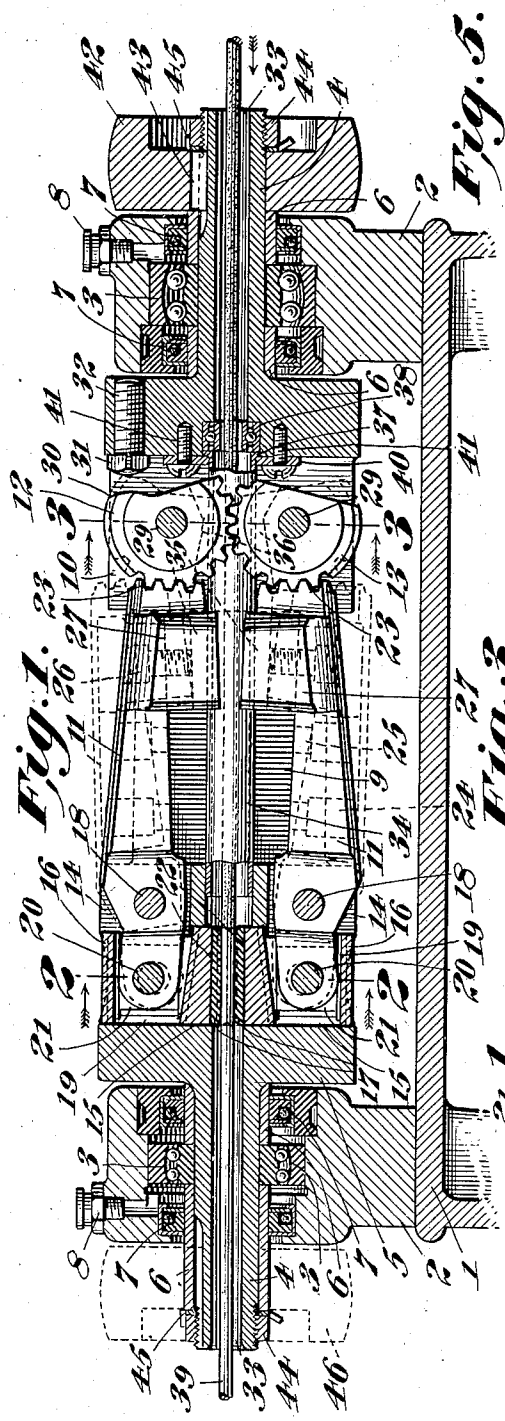


Fig. 1.

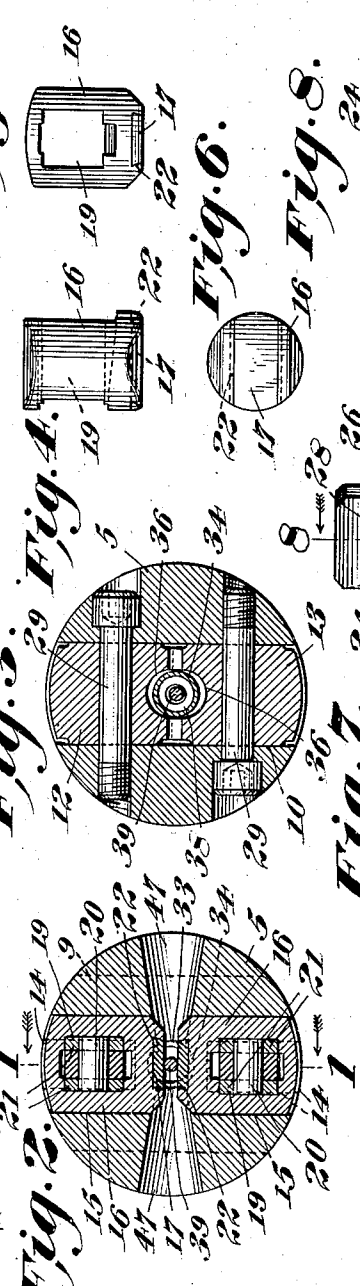


Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.

Fig. 6.

Fig. 7.

Fig. 8.

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APPARATUS FOR POLISHING WIRE

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21 Claims. (Cl. 29—90.5)

This invention relates to apparatus for polishing or burnishing material, and is more particularly adapted for use in polishing galvanized wires, rods and the like, and an object of this invention is to provide an improved construction that will be automatic and continuous in operation, and which will insure accurate polishing of the material at a relatively low cost.

One of the objects of my invention relates to the means whereby the pressures of the polishing dies which engage opposite sides of the wire are controlled by a pair of pivoted levers which are actuated by centrifugal force when the polishing frame body of the machine is rapidly rotated.

Another feature of the invention relates to the manner of controlling the swinging movement of the pivoted levers so that they will swing inwardly or outwardly in unison.

Another object of my invention relates to the manner of adjusting the pressure of the polishing dies on the material as it passes through the machine.

A further object of my invention is directed to the construction and mounting of the blocks for holding the polishing dies.

With these and other objects in view, the invention consists of certain novel features of construction, as will be more fully described, and particularly pointed out in the appended claims.

Having thus given a general description of the objects of my invention, I will now in order to make the same more clear refer to the annexed one sheet of drawings forming a part of this specification and in which like characters of reference indicate like parts:

Figure 1 is a vertical longitudinal section of the machine taken substantially on the line 1—1 of Fig. 2 with parts shown in elevation.

Fig. 2 is a transverse section taken on the line 2—2 of Fig. 1.

Fig. 3 is a transverse section taken on the line 3—3 of Fig. 1.

Fig. 4 is a detail side elevation of one of the blocks for holding one of the polishing dies.

Fig. 5 is an end elevation of the block shown in Fig. 4.

Fig. 6 is a bottom plan view of the die block with the die in place.

Fig. 7 is a plan view of one of the pivoted swinging levers and Fig. 8 is a detail transverse section taken on the line 8—8 of Fig. 7.

Referring now to the various characters of reference on the drawing, the numeral 1 designates the bed of the machine which is supported in any suitable manner, 2 a pair of spaced journal bearings each provided with a roller bearing 3, therein for receiving and supporting the reduced tubular neck ends 4 of a cylindrical polishing frame body 5. The roller bearings 3 are held in position on the tubular necks 4 by means of the bushings 6 and the bearings 2 are further equipped with oil seals 7 and oil inlet supply valves or the like 8.

The cylindrical polishing frame body 5 is provided at its intermediate portion with a transverse rectangular opening 9, which is reduced in width at one end as at 10 for receiving a pair of swinging levers 11 and mutilated gears 12 and 13 respectively, and centrally disposed at the opposite end of said rectangular opening 9 the polishing frame body 5 is formed with a pair of aligned grooves 14 and transversely extending cylindrical slideway openings 15 for receiving the cylindrically shaped die holder blocks 16 for the polishing dies 17.

The pair of swinging levers 11 are duplicates and disposed longitudinally and in transverse alignment with each other at opposite sides of the machine, with their intermediate portions in the grooves 14 and pivoted to the polishing frame body 5 by means of bolts 18. One end of each swinging lever 11 is adapted to extend into a rectangular opening 19 in one of the die holder blocks 16 as indicated more clearly in Figs. 1 and 2 and is pivoted by means of a pin 20 to a pair of liner plates 21 which are adapted for a slight sliding movement in relation to the die holder blocks 16 to compensate for the slight arc shaped path of travel of the pin 20 during the swinging movement of the levers. The inner face of each die holder block 16 is provided with a dovetailed recess 22 for receiving the polishing die 17 formed of hard steel or alloy such as "Firthite" which is sweated in place and having its inner face highly polished.

The opposite end of each swinging lever 11 is formed with a rack 23 for meshing with one of the mutilated gears 12 or 13 as the case may be. The intermediate portion of each swinging lever 11 is also provided at spaced intervals with sockets 24 and holes 25 for receiving cap screws 26 by means of which a weight 27 may be adjustably attached to each swinging arm, and in order that the weights may be more firmly held in position they are each formed with a channel as at 28.

The mutilated gears 12 and 13 are of slightly different formation and are disposed in the reduced opening 10 and rotatably mounted on bolts 29 which are attached to the burnishing frame body 5. The upper mutilated gear 12 is provided with a shoulder 30 adapted to engage the head 31 of an adjusting screw 32 for limiting the outward movement of the swinging levers 11.

The end portions of the cylindrical polishing frame body 5 and the necks 4 therefor as indicated in Fig. 1 are formed tubular with the opening 33 connected together centrally between the swinging levers 11 and mutilated gears 12 and

13 by means of a pipe section 34, and to allow for clearance between the weights 27 and the mutilated gears they are provided with arc-shaped grooves 35 and 36 respectively. This pipe section 34 is plain at one end and is inserted in the opening 33 adjacent to the burnishing dies 17 at one end of cylindrical polishing frame body 5, while the opposite end of said pipe section which connects the opening 33 at the opposite end of the frame body is flanged as at 37 and clamped in position against a roller guide 38 for the wire 39 by means of a plate 40 which is secured in position by means of screws 41.

In order to rapidly rotate the cylindrical polishing frame body 5 one of the neck ends is provided with a pulley 42 which is keyed to the neck 4 as at 43 and held in position by means of a nut 44 threaded on the end of the neck and a lock washer 45.

This machine may be adapted for use as a right or left hand unit. When assembled as a right hand unit the parts will be disposed in the position shown in full lines, but for a left hand unit the pulley will be mounted on the neck at the opposite end of the machine as indicated in dotted lines at 46, and the journal bearing with the larger roller bearing 3 will also be mounted at that end of the machine.

As it is desirable to inspect the polishing dies 17, transverse openings 47 are formed in the cylindrical polishing frame body 5.

The operation of the machine is as follows: assuming that the machine is not operating and the dies are closed with their polishing surfaces in contact with each other and the swinging levers 11 in the position indicated in dotted lines in Fig. 1 the operator presses the swinging levers inwardly thereby opening the dies to their full extent.

The end of the plated wire to be polished which may be received in the usual manner from a pay-out reel located adjacent to the end of the machine is inserted manually into the central opening 33 at the right hand end of the machine and advanced through the roller guide 38, pipe section 34, between the polishing dies 17 and out through the opening 33 at the left hand end of the machine, the end of the wire is then attached to a take-up reel. The cylindrical polishing frame body 5 and the parts associated therewith are then rotated rapidly by means of a motor or the like having a belt connection with the pulley 42. As the take-up reel advances the wire through the machine the faces of the polishing dies are pressed firmly against the plated surface of the wire as it is rotated around the same by means of the centrifugal force of the weighted swinging levers. This pressure may be varied by adjusting the weights on said swinging levers, while the mutilated gears 12 and 13 engaging the racks 23 insure a uniform in-and-out movement of the levers.

For illustration I have described my invention as particularly adapted for use in polishing galvanized wire but I wish it understood that other kinds of plating may be polished or dies could be used for cleaning, scouring or grinding wire surfaces equally as well.

Although I have shown and described my invention in considerable detail, I do not wish to be limited to the exact construction shown and described, but may use such substitutions, modifications or equivalents thereof, as are embraced within the scope of my invention, or as pointed out in the claims.

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

1. In a polishing machine, a frame, spaced journal bearings for supporting the frame, means for rotating the frame, a pair of coacting dies mounted for radial movement in the frame, a swinging lever pivoted to the frame for actuating each dies adapted to throw the dies inwardly toward the axis of the frame into operative position by centrifugal force during the rotation of the frame and means for gearing one end of the swinging levers together.

2. In a polishing machine, a frame, spaced journal bearings for supporting the frame, means for rotating the frame, a slideway formed in the frame, a pair of oppositely disposed coacting die holders each having a die mounted in the slideway, a swinging lever for actuating each die holder pivoted to the frame with one end extending into the die holder and their opposite ends geared together adapted to throw the dies into operative position by centrifugal force during the rotation of the frame.

3. A machine for polishing wire or the like, comprising a bed plate, a pair of spaced journal bearings mounted on the bed plate, a frame supported by the journal bearings, means for rotating the frame, transverse slideways formed in the frame, a pair of coacting die holders mounted in the slideways, a die secured to each die holder, swinging levers geared together at one end each pivoted to the frame at an intermediate point and their opposite ends connected to the die holders adapted to throw the dies into operative position by centrifugal force during the rotation of the frame.

4. In a machine for polishing strand material, a frame, spaced journal bearings for supporting the frame, means for rotating the frame, a centrally disposed tubular passageway in the frame for receiving an advancing strand, a transversely extending slideway formed in the frame, a pair of coacting die holders each having a die mounted in the slideway adapted to engage opposite sides of the strand, a swinging lever for actuating each die holder pivoted at an intermediate point to the frame with one end slidably supported in the die holder and their opposite ends geared together adapted to throw the dies into engagement with the strand by centrifugal force during the rotation of the frame.

5. In a machine for polishing strand material, a frame, spaced journal bearings for supporting the frame, means for rotating the frame, a centrally disposed tubular passageway through the frame for receiving an advancing strand, a slideway in the frame disposed in transverse alignment at opposite sides of the strand, a die holder each having a die mounted in each slideway adapted to engage opposite sides of the strand, a rectangular opening through each die holder, liner plates slidably movable in each rectangular opening in each die holder, a swinging lever for actuating each die holder pivoted at an intermediate point to the frame with one end pivoted to the liner plates and their opposite ends connected together to move in unison to throw the dies into engagement with opposite sides of the strand by centrifugal force during the rotation of the frame.

6. A machine for polishing plated wire or the like, comprising a bed plate, a pair of spaced journal bearings mounted on the bed plate, a frame having neck ends journaled in the bear-

ings, a tubular passageway extending through the axis of the frame and neck ends for receiving an advancing wire, transversely aligned slideways formed in the frame near one end, means for rotating the frame, a die holder in each slideway having a die attached to its inner face for engaging opposite sides of the wire, a rectangular opening through each die holder, a pair of liner plates mounted for sliding movement in each rectangular opening in each die holder, a swinging lever for actuating each die holder pivoted at an intermediate point to the frame with one end pivoted to the liner plates and their opposite ends geared together to swing in unison to throw the dies into or out of engagement with the wire.

7. A machine for polishing plated wire or the like, comprising a bed plate, a pair of spaced journal bearings mounted on the bed plate, a frame having neck ends journaled in the bearings, a tubular passageway through the axis of the frame and neck ends for receiving an advancing wire, a pair of transversely aligned slideways formed in the frame near one end having cylindrical surfaces, means for rotating the frame, a cylindrical die holder in each slideway having a die attached to its inner face for engaging opposite sides of the wire, a rectangular opening through each die holder, a pair of liner plates mounted for sliding movement in each rectangular opening in the die holders, a swinging lever for each die holder pivoted at an intermediate point to the frame with one end extending into the rectangular opening in the die holder and pivoted to the liner plates, means for gearing the opposite ends of the swinging levers together, means for actuating the swinging levers by centrifugal force during the rotation of the frame to throw the dies into engagement with the wire, and means for adjusting the pressure of the centrifugal force on the wire.

8. A machine for polishing plated wire or the like, comprising a pair of spaced journal bearings, a frame having neck ends journaled in the bearings, a tubular passageway through the axis of the frame and neck ends for receiving an advancing wire, transversely aligned slideways having cylindrical surfaces in the frame disposed in alignment on opposite sides of the wire, means for rotating the frame, a cylindrical die holder in each slideway having a die attached to its inner face for engaging the wire, and pivoted levers slidably connected to the die holders and actuated by centrifugal force during the rotation of the frame adapted to throw the dies into engagement with the wire.

9. A machine for polishing plated wire or the like, comprising a pair of spaced journal bearings, a frame having reduced neck ends journaled in the bearings, a tubular passageway through the axis of the frame and neck ends for receiving an advancing wire, transversely aligned slideways in the frame disposed on opposite sides of the wire, means for rotating the frame, a die holder in each slideway having a die attached to its inner face for engaging the wire, and a swinging lever pivoted at an intermediate point to the frame and connected at one end to each die holder and their opposite ends geared together actuated by centrifugal force during the rotation of the frame to throw the dies into engagement with the wire.

10. A machine for polishing plated wire or the like, comprising a pair of spaced journal bearings, a frame having reduced neck ends journaled in the bearings, a tubular passageway through the axis of the frame and neck ends for receiving an advancing wire, transversely aligned slideways in the frame near one end disposed on opposite sides of the wire, means for rotating the frame, a die holder in each slideway having a die attached to its inner face for engaging the wire, a swinging lever pivoted at an intermediate point to the frame and slidably connected at one end to each die holder and their opposite ends geared together actuated by centrifugal force during the rotation of the frame to throw the dies into engagement with the wire, and means for adjusting the pressure of the centrifugal force of the die on the wire.

11. A machine for polishing plated wire or the like, comprising a pair of spaced journal bearings, a frame having reduced neck ends journaled in the bearings, a tubular passageway through the axis of the frame and neck ends for receiving an advancing wire, a pair of slideways disposed transversely in alignment near one end of the frame on opposite sides of the wire, means for rotating the frame, a die holder in each slideway having a die attached to its inner face for engaging the wire, a swinging lever for actuating each die holder each pivoted at an intermediate point to the frame and having one end slidably connected to the die holder and their opposite ends geared together to move in unison, said swinging levers adapted to be actuated by centrifugal force during the rotation of the frame to throw the dies simultaneously into engagement with the opposite sides of the wire, and a weight mounted for adjustment on each swinging lever for adjusting the pressure of the centrifugal force of the dies on the wire.

12. A machine for polishing plated wire or the like, comprising a pair of spaced journal bearings, a frame having reduced neck ends journaled in the bearings, a tubular passageway through the axis of the frame and reduced neck ends for receiving an advancing wire, transversely aligned slideways in the frame having cylindrical surfaces disposed on opposite sides of the wire, a cylindrical die holder in each slideway having a die attached to its inner face for engaging the wire, a rectangular opening extending through each die holder, a liner plate at each side of the rectangular opening in each die holder, a swinging lever for actuating each die holder pivoted at an intermediate point to the frame having one end pivoted to the liner plates mounted in the die holder and the opposite ends geared together to swing the levers in unison, and means for rotating the frame to actuate the swinging levers by centrifugal force to throw the dies simultaneously into engagement with the side of the wire.

13. A machine for polishing plated wire or the like, comprising a pair of spaced journal bearings, a frame having reduced neck ends journaled in the bearings, a tubular passageway through the axis of the frame and the reduced neck ends for receiving an advancing wire, transversely aligned slideways in the frame having cylindrical surfaces disposed on opposite sides of the wire, a cylindrical die holder in each slideway having a die attached to its inner face for engaging the wire, a rectangular opening extending through each die holder, a liner plate mounted for sliding movement at each side of the rectangular opening in each die holder, a swinging lever for actuating each die holder piv-

oted at an intermediate point to the frame having one end pivoted to the liner plates mounted in the die holder, a rack formed at the opposite end of each swinging lever, a gear engaging each rack and meshing with each other to swing the levers in unison, and means for rotating the frame to actuate the swinging levers by centrifugal force to throw the dies simultaneously into engagement with the sides of the wire.

14. A machine for polishing plated wire or the like, comprising a bed plate, journal bearings mounted thereon, a frame rotatably supported by the journal bearings, means for rotating the frame, a tubular passageway through the axis of the frame for receiving an advancing wire, a pair of coacting polishing dies mounted for transverse movement in the frame, and a pair of swinging levers pivoted to the frame and connected together at one end, actuated centrifugally by the rotation of the frame for forcing the polishing dies toward the axis of the frame into engagement with the wire.

15. A machine for polishing plated wire or the like, comprising a bed plate, journal bearings mounted thereon, a frame rotatably supported by the journal bearings, a tubular passageway through the axis of the frame for receiving an advancing wire, a pair of transversely aligned slideways formed in the frame, a die holder in each slideway, a dovetailed recess formed in the inner face of each die holder, a die secured in each dovetailed recess, a swinging lever pivoted to the frame at an intermediate point and having one end connected to each die holder and the opposite ends of said swinging levers geared together actuated centrifugally by the rotation of the frame for forcing the polishing dies toward the axis of the frame into engagement with the wire.

16. A machine for polishing plated wire or the like, comprising a bed plate, journal bearings mounted thereon, a frame rotatably supported by the journal bearings, means for rotating the frame, a tubular passageway through the axis of the frame for receiving an advancing wire, a pair of aligned coacting polishing dies mounted for transverse movement in the frame on opposite sides of the tubular passageway, and a pair of swinging levers pivoted to the frame having one of their ends geared together and adapted to be actuated centrifugally by the rotation of the frame for forcing each of the polishing dies toward the axis of the frame into engagement with opposite sides of the wire.

17. A machine for polishing plated wire or the like, comprising a bed plate, journal bearings mounted thereon, a frame rotatably supported by the journal bearings, means for rotating the frame, a tubular passageway through the axis of the frame for receiving an advancing wire, a pair of aligned coacting polishing dies mounted for transverse movement in the frame on opposite sides of the tubular passageway, a swinging lever pivoted at an intermediate point to the frame having one end connected to a die and actuated centrifugally by the rotation of the frame for forcing each of the polishing dies toward the axis of the frame into engagement with opposite sides of the wire, gearing for moving the swinging levers in unison, and means for limiting the movement of the swinging levers.

18. A machine for polishing plated wire or the like, comprising a bed plate, journal bearings mounted thereon, a cylindrical frame having reduced neck ends extending therefrom journaled in the bearings, means for rotating the frame, a tubular passageway through the axis of the frame for receiving an advancing wire, an opening through the central portion of the cylindrical frame, a pair of transversely aligned slideways in the cylindrical frame adjacent to one end of the opening, a die holder in each slideway having a polishing die secured to its inner face adapted to revolve around the wire during the rotation of the frame, a pivoted swinging lever mounted in the cylindrical frame opening having one end connected to each die holder and the opposite ends of said swinging levers geared together and adapted to be actuated centrifugally by the rotation of the frame to force each of the polishing dies toward the axis of the frame into engagement with opposite sides of the wire.

19. A machine for polishing plated wire or the like, comprising a pair of spaced journal bearings, a frame journaled in the bearings, means for rotating the frame, a tubular passageway through the axis of the frame for receiving an advancing wire, a slideway on each side of the tubular passageway disposed in alignment with each other, a polishing die mounted in each slideway adapted to revolve around the wire during the rotation of the frame, and means actuated centrifugally by the rotating frame for forcing the polishing dies into engagement with the surface of the wire.

20. A machine for polishing plated wire or the like, comprising a bed plate, a pair of spaced journal bearings mounted thereon, a frame having reduced neck ends journaled in the bearings, means for rotating the frame, a tubular passageway through the axis of the frame and reduced neck ends for receiving an advancing wire, a roller guide for the wire in the passageway, a slideway on each side of the tubular passageway near one end of the frame disposed in alignment with each other, a die holder having a polishing die secured to its inner face adapted to revolve around the wire during the rotation of the frame, and swinging levers pivoted to the frame and actuated centrifugally by the rotating frame for forcing the polishing dies into engagement with the surface of the wire.

21. A machine for polishing plated wire or the like, comprising a bed plate, a pair of spaced journal bearings mounted thereon, a frame having reduced neck ends journaled in the journal bearings, a tubular passageway through the axis of the frame and reduced neck ends for receiving an advancing wire, a slideway on each side of the tubular passageway near one end of the frame disposed in transverse alignment with each other, a die holder in each slideway having a polishing die secured to its inner face adapted to revolve around the wire during the rotation of the frame, a swinging lever connected at one end to each die holder pivoted at an intermediate point to the frame and actuated centrifugally by the rotating frame for forcing the polishing dies into engagement with the surface of the wire, gearing for moving the swinging levers in unison, and means for limiting the swinging movement of the levers.

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