

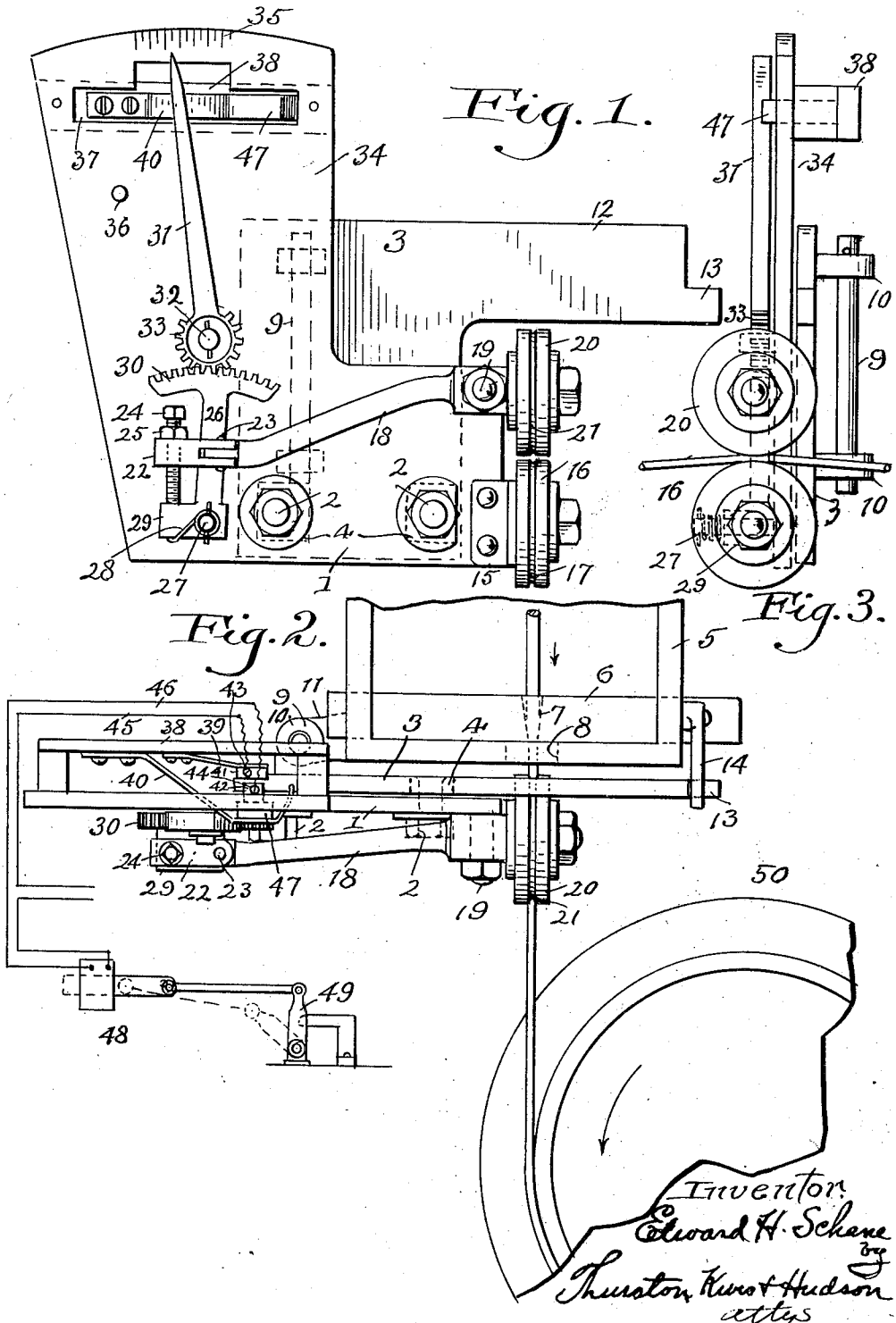
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E. H. SCHANE

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GAUGE INDICATING DEVICE FOR WIRE DRAWING MACHINES

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EDWARD H. SCHANE, OF CLEVELAND, OHIO.

GAUGE-INDICATING DEVICE FOR WIREDRAWING MACHINES.

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This invention relates to a gauge indicating device for wire drawing machines or other machines for continuously forming articles of uniform thickness or diameter, and has for its object to provide a device which will accurately indicate small increases in the diameter or thickness of the wire or other material.

A further object is to provide in connection with the gauge indicating device an electrical contact member controlling an electric circuit for actuating a signal or stop device, said contact member being adapted to be actuated upon a predetermined movement of the indicator.

A further object is to provide a gauge indicating device which is movable as a unit upon the supporting frame work so that it can be moved bodily away from the front of the die so as not to interfere with the drawing of the end of a wire or rod through the die. A further object of the invention is to provide a gauge indicating device which can be readily adjusted for wires of different sizes.

Other objects will be apparent from the following description and the accompanying drawing.

The following description and accompanying drawing set forth in detail certain means embodying the invention, the disclosed means, however, constituting but one of the various mechanical forms in which the principle of the invention may be employed.

Reference should be had to the accompanying drawings forming a part of this specification in which Fig. 1 is a front elevation of the gauge indicating mechanism; Fig. 2 is a top plan view showing the gauge indicating mechanism applied to a wire drawing machine; Fig. 3 is a side elevation of the gauge indicating mechanism.

Referring to the accompanying drawings, the gauge indicating mechanism is mounted upon a plate 1 which is secured by means of bolts 2 to a supporting plate 3 which is adapted to be movably supported upon the fixed frame work of the machine immediately in front of the die through which the wire is drawn. The plate 1 is provided with enlarged openings 4 through which the attaching bolts 2 extend so that the plate 1 can be adjusted with respect to the supporting plate 3 to properly position the wire

engaging devices carried thereby. The fixed frame work of the machine includes a box 5 in which the hardened steel die plate 6 is removably secured. The die plate 6 has a conical aperture 7 which is placed in alignment with an opening 8 in the front end of the box 5. The box 5 is adapted to hold a suitable body of lubricant through which the wire or rod which is drawn to a smaller diameter through the aperture 7 passes in the operation of the machine. The supporting plate 3 is pivotally connected to the front end of the box 5 at one side thereof by means of a vertical hinge pintle 9 which passes through ears 10 on the plate 3 and ears 11 projecting laterally from the box 5. The lower portion of the plate 3 is cut away to leave a clear space in front of the die aperture and has an upper portion 12 which extends across the front of the box 5. At the end of the portion 12 of the plate 3 there is a projection 13 which is adapted to be engaged by a hook or latch 14 pivoted to the side of the box 5 opposite the hinge connection. By means of the pivotal mounting of the supporting plate 3 the gauge indicating mechanism can be swung bodily to one side of the box 5 so that it will not interfere with the initial operation in starting the wire or rod through the die.

The lower portion of the plate 1 overlaps the cutaway portion of the supporting plate 3 and terminates just short of the die aperture. Rigidly secured to the plate 1 below the die aperture is a bracket 15 which carries a roller 16 which has a peripheral groove 17 which is in alignment at the top of the roller with the die aperture so that the wire drawn through the die engages in the groove 17. A lever 18 which extends along the front face of the plate 1, is connected to the plate adjacent the edge thereof above the die aperture by means of a horizontal pivot 19. The end of the lever 18 which extends over the die aperture is formed to provide a spindle for a roller 20 which has a peripheral groove 21 in alignment with the groove 17 of the fixed roller 16 and bears upon the top surface of the wire in front of the die aperture. The roller 20 is held by gravity in engagement with the wire and upon increase of the diameter of the wire will be moved upwardly. The opposite end of the lever 18 has an extension 22 connected thereto by a vertical

pivot 23, the parts of the pivotal connection having sufficient frictional engagement to hold the extension 22 in adjusted position. The extension 22 has a vertical aperture 5 threaded to receive a set screw 24 which is held in adjusted position by means of a lock nut 25. A pointer actuating member 26 is connected to the plate 1 adjacent its lower end by means of a horizontal pivot 27 and is 10 engaged adjacent the pivot by a coil spring 28 which is set to swing the actuating member 26 to the right as shown in Fig. 1. Adjacent its lower end, the member 26 has a lateral extension or lug 29 which has a flat upper face adapted to be engaged by the lower 15 end of the set screw 24 so that upward movement of the roller 20 will move the actuating member 26 in opposition to its spring 28. The actuating member 26 carries a gear segment 30 at its upper end through which 20 the pointer 31 is actuated. The pointer 31 is pivoted to turn on the plate 1 about a horizontal pivot 32 and has a gear segment 33 concentric with the pivot and meshing with 25 the gear segment 30 of the actuating member. The plate 1 has a dial portion 34 extending upwardly behind the pointer 31, the upper edge of the dial portion 34 being provided with a suitably graduated scale 30 35 for indicating the increase in the diameter in the wire being drawn. A stop pin 36 projects from the plate 1 in the path of movement of the pointer 31 and limits the movement of the pointer in one direction. 35 The pivotal mounting of the pointer actuator extension 22 of the lever 18 permits the lever to be quickly freed from the indicator or to be quickly reengaged therewith so that the indicating mechanism may be rendered 40 inoperative without stopping the operation of the machine and without adjusting the support.

In operation the supporting plate 3 will be latched in front of the box 5 and the rollers 45 16 and 20 will be placed in engagement with the lower and upper sides of the wire. The set screw 24 will then be adjusted to bring the pointer 31 to zero position on the scale 35. In the operation of a wire drawing machine, the die aperture is gradually worn to a larger diameter and as the die aperture enlarges the diameter of the wire is increased. An increase in the diameter of the wire passing between the rollers 16 and 20 50 will cause the roller 20 to be lifted rocking the lever 18 about its pivot 19 and through the set screw 24 swinging the actuating member 26 in opposition to its spring 28. This causes the pointer 31 to move over the dial a distance proportional to the upward 60 movement of the roller 20. By reason of the movement multiplying connections between the roller 20 and the pointer 31 a very slight increase in the diameter of the wire 65 will cause a much greater movement of the

pointer 31. The movement of the pointer 31 being exactly proportional to the movement of the roller 20, the extent of enlargement of the wire is accurately indicated so that it is possible to limit the variation in the diameter of the wire within the desired limits. For wire which is oval, flat or polygonal in cross-section, the die aperture and grooves in the gauging rollers will be correspondingly modified. 70 75

It is desirable to provide in addition to the indicating device above described, more positive means for preventing an excessive variation in the diameter of the wire produced. To this end a transverse slot 37 is 80 provided in the upper part of the dial plate 34 and at the rear of this slot is mounted an insulating plate 38 to which are attached contact strips 39 and 40 which are rigidly attached at one end to the insulating plate 85 38. The strips 39 and 40 are inclined forwardly from the plate 38 and have metallic blocks 41 and 42 secured to their outer ends, the block 42 being suitably insulated from 90 the outer strip 40. The blocks 41 and 42 carry binding posts 43 and 44 to which are attached the wires 45 and 46 which are connected to a suitable source of current and form a circuit for operating a visible or audible signal or a device for stopping the operation 95 of the wire drawing mechanism. The outer free end 47 of the strip 40 extends through the slot 37 of the dial plate 34 and lies in the path of the pointer 31. When the pointer 31 engages the outer end portion 100 47 of the strip 40, the strip 40 is moved inwardly bringing the block 42 into engagement with the block 40 on the strip 44 closing the circuit through the wires 45 and 46. As above stated, the closure of the circuit 105 through the wires 45 and 46 may operate a visible or audible signal which will indicate to the operator that the limit of permissible variation in the gauge of the wire has been reached so that the operator will stop the 110 machine and replace the die with a new die having an aperture of the proper size. It is considered preferable, however, to employ this circuit to automatically stop the operation of the wire drawing machine. To this 115 end the wires 45 and 46 are connected to the terminals of a solenoid 48, the core of which is connected in a suitable manner to the switch 49 of the motor which operates the drawing reel 50 which pulls the wire 120 through the die.

Having described my invention, I claim—

1. In a machine of the character described, the combination with the forming means through which the material passes, of a 125 gauge indicating device in the form of a unit supported on the machine for movement into and out of operative position with respect to the material, said device comprising relatively movable members adapted to engage 130

opposite sides of the material and to yieldably grip the material between them and indicating means associated with said relatively movable members.

2. In a machine of the character described, the combination with the forming means through which the material passes, of a gauge indicating device comprising a supporting member adjustably mounted on the machine, a graduated dial, a pointer carried by the supporting member and movable over said dial; and a shiftable member carried by said supporting member and engageable with the material adjacent the forming means, said shiftable member being connected to said pointer to actuate the same, said supporting member being movable to a position in which the shiftable member is held out of engagement with the material.

3. In a machine of the character described, the combination with the forming means, of a gauge indicating device comprising a supporting member pivoted on the machine at one side of the forming means, a pair of rollers carried by the supporting member at the free end thereof and adapted when the supporting member is in operative position to engage with opposite sides of the material adjacent the forming means, one of said rollers being bodily shiftable with respect to the other and indicating means connected to said shiftable roller.

4. In a machine of the character described, the combination with the forming means, of a gauge measuring device, and means adapted to be operated by said measuring device for stopping the operation of the machine upon a predetermined increase in the gauge of the material.

5. In a machine of the character described, the combination with the forming means through which the material passes, of a gauge indicating device comprising relatively movable members adapted to engage opposite sides of the material and to yieldingly grip the material between them, an indicating device associated with said members and controlled by relative movement thereof, a plate upon which said members and indicating device are mounted, a supporting member for said plate, means for securing the plate to the supporting member permitting adjustment of the plate on the supporting member to position the engaging members with respect to the material, means for pivotally securing the supporting member to the machine to permit movement of the gauge indicating device as a unit to and from operative position.

6. In a wire drawing machine, the combination with the die and means for drawing the wire through the die, of a gauge indicating device comprising a fixed roll engageable with the under portion of the wire immediately in front of the die, a lever pivoted

intermediate its ends to turn about an axis parallel with the axis of the die and adjacent one end of the lever, said lever carrying a roller at the end thereof adjacent the pivot directly over the first mentioned roller and engaging the upper portion of the wire, a fixed dial, a pointer movable over the dial and operating connections between the opposite end of said lever and the pointer.

7. In a machine of the character described, the combination with the forming means of a gauge indicating device comprising a movable indicator, an actuating lever having a material engaging part, said lever being so mounted as to be moved by the material as the thickness thereof increases, and operating connections between said lever and indicator, said connections including an adjustable part whereby said indicator may be adjusted with respect to said lever.

8. A gauge indicating device comprising fixed and shiftable rollers between which the material is adapted to pass, an indicating member, connections between said shiftable roller and indicating member for actuating the same, and an adjustable support for the rollers by means of which the rollers may be shifted bodily out of material engaging position.

9. A gauge indicating device adapted to be attached to a material forming machine and having a part adjacent the forming means through which the material passes comprising a pivotally mounted supporting plate having a dial thereon and a pointer movable over the dial, a shaft fixed to the plate and projecting beyond an edge thereof, a roller carried by the shaft and adapted to engage the under portion of the material, a lever pivoted to the plate and having an end projecting beyond the edge of the plate, said projecting end of the lever carrying a roller directly over the fixed roller and a pointer actuating member having a part adapted to be engaged by said lever.

10. A gauge indicating device adapted to be attached to a material forming machine ahead of the forming means through which the material is passed comprising a supporting plate having a dial thereon and a pointer pivoted thereto and movable over the dial, a gear segment on the pointer, a second gear segment meshing with the first gear segment and pivoted to the plate, said segment having a laterally projecting lug, a spring connected to said segment for moving the same in one direction, a lever pivoted to said plate, an adjustable member carried by said lever and engageable with said lug on the second segment to actuate the same in opposition to the spring upon movement of the lever in one direction, and a roller carried by the lever and engaging the material.

11. The combination with a wire drawing

machine having a die and means for drawing the wire through the die, of a gauge indicating device comprising a fixed lower roll engageable with the under portion of the wire adjacent the die, a lever carrying a roller engaging the upper portion of the wire directly over the fixed roller, said lever being pivoted adjacent the end carrying the roller to turn about an axis parallel to the axis of the wire, a dial plate, a pointer pivoted thereto, an actuating member pivoted on an axis parallel to the pivotal axis of the pointer, said actuating member having a gear connection with the pointer and a laterally projecting lug, a spring connected to said actuating member for normally holding the pointer in zero position, an end piece pivoted to the free end of said lever on an axis parallel with the plate, and a set screw substantially parallel with the plate carried by said pivoted end piece and engageable with the laterally projecting lug of said actuating member whereby said actuating member may be moved by said lever in opposition to the spring when the lever is moved by reason of an increase in the size of the wire passing through the rollers.

12. The combination with a material forming machine, of a shiftable member engaging the material adjacent the forming means, an electric switch and means for closing said switch upon a predetermined movement of said shiftable member due to an increase in the size of the material.

13. A gauge indicating device comprising a dial, a pointer movable over the dial, a pair of members between which the material passes, one of said members being shiftable, operating connections between said shiftable member and pointer, and an electrical contact member in the path of said pointer adapted to be actuated by said pointer upon a predetermined movement of said shiftable

member due to an increase in the thickness of the material.

14. In a wire drawing machine the combination with the die and means for drawing the wire through the die, of a gauge indicating device including wire engaging members, said indicating device being mounted upon a support adapted to be secured in operative position in front of the die and movable to an inoperative position clear of the wire drawing mechanism.

15. In a wire drawing machine, the combination with the die and means for drawing the wire through the die, of a gauge indicating device carried by a supporting member connected by a vertical pivot to the frame work of the machine, means for securing said supporting member in operative position in front of the die, fixed and shiftable wire engaging members carried by said supporting member, and indicating means operatively connected to said shiftable wire engaging member.

16. The combination with a material forming machine having means for continuously forming the material, of automatic means including a movable part engaging the material in front of the forming means for stopping the operation of the machine upon a predetermined increase in the gauge of the material.

17. The combination with a wire drawing machine, of a shiftable member engaging the wire adjacent the die, means for stopping the operation of said wire drawing machine, and connections between the shiftable member and stopping means whereby the machine will be stopped upon a predetermined increase in the diameter of the wire.

In testimony whereof, I hereunto affix my signature.

EDWARD H. SCHANE.