July 29, 1930. E. R. POPE 1,771,418

INDICATING SYSTEM

Filed Sept. 8, 1923

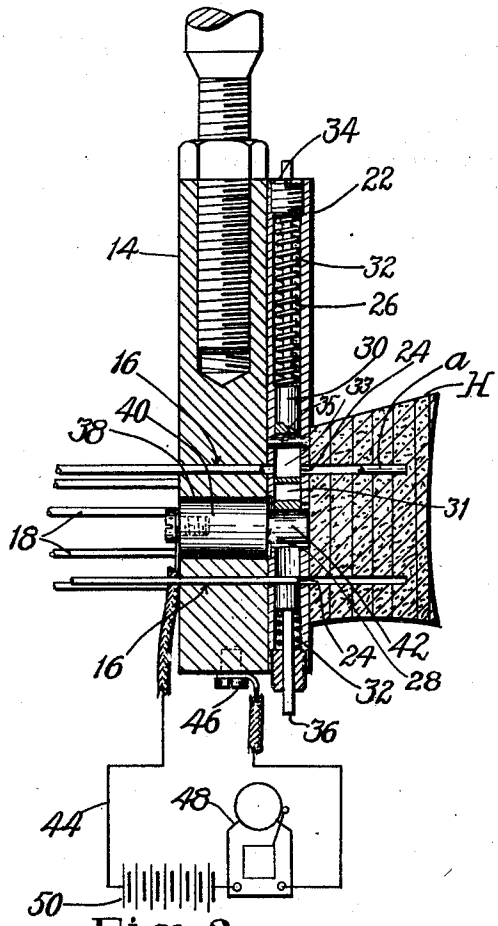


Fig. 3.

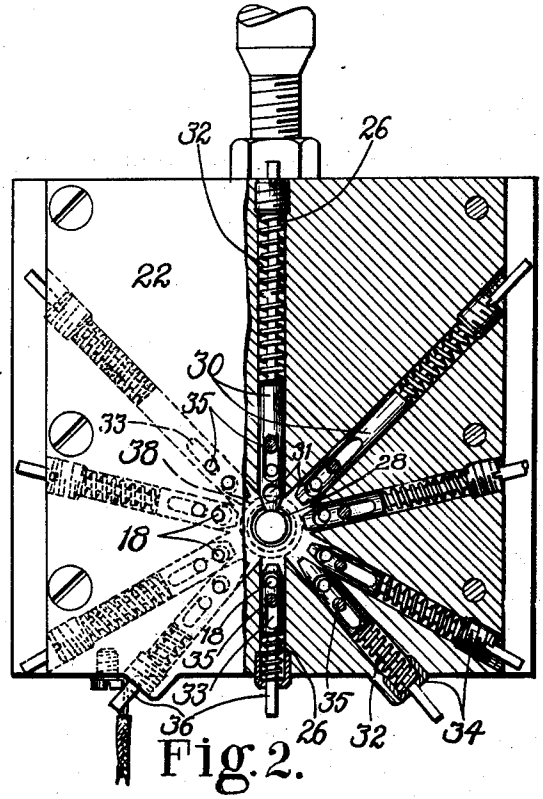


Fig. 2.

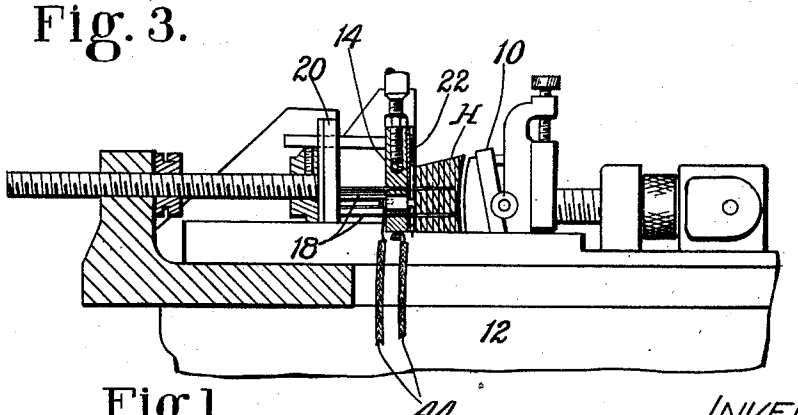


Fig. 1.

INVENTOR

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UNITED STATES PATENT OFFICE

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INDICATING SYSTEM

Application filed September 8, 1923. Serial No. 661,693.

This invention relates to systems for indicating the condition of tools, as, for example, whether they have become broken in use. It is of especial utility in connection with the awls of heel-pricking machines.

In apparatus for pricking the heels of shoes preparatory to nailing, the awls are not infrequently broken, this occurring upon their withdrawal and leaving the broken ends in the heel-substance. The broken portions are almost invariably of less length than the depth of the holes which they form. Consequently, the ends of the bodies left in the awl-plate are concealed by the templet through which they operate, while the ends within the heel are equally hidden by being near the bottoms of the pricked holes. When the operator discovers the fact that an awl has been broken, it is necessary to find the heel containing the end to prevent breakage of a driver of the heeling machine by such driver striking the awl-end. To accomplish this, it is customary for the operators, with much loss of time, to test the entire lot of heels which migh contain the piece, by sounding with a nail the holes corresponding to the broken awl. The presence of the piece is indicated by the metallic click produced when the nail strikes the piece sought. An object of my invention is to avoid this loss of time by furnishing means which will indicate the breaking or change of condition of the awl or other tool, substantially as soon as it occurs. This, in the particular machine herein disclosed, is effected by an alarm device under the control of a member restrained by an awl.

In the accompanying drawing, illustrating one application of my invention to a heel-pricking machine,

Fig. 1 shows a portion of such a machine in side elevation, with the present indicating system attached thereto,

Fig. 2 is a front elevation of the templet, with a portion in section, and

Fig. 3 is a central, vertical section through said templet, with the indicating circuit connected thereto.

The pricking machine disclosed is substantially that of Patent No. 1,234,384, Pope, July 24, 1917, and will not be described in detail. It is sufficient to say that a heel H to be operated upon is forced by a follower 10, sliding upon a frame 12, toward a templet 14. In this templet are horizontal perforations 16 in which are located the ends of awls 18, fixed upon a plate 20 arranged to reciprocate upon the frame. The stroke of the awls and the relation of their ends to the templet are such that said ends are never withdrawn rearwardly from the perforations 16, but are projected at the front of the templet into the heel-substance to the depth to which it is desired they shall penetrate.

Secured to the front of and forming a portion of the templet, is a carrier-plate 22 in which are openings 24 registering with the perforations 16 of the templet. In the carrier-plate, communicating with the sides of the openings 24 and thus intersecting the paths of the awls, are passages 26. These passages also intersect, meeting at the center of the pricking design to furnish a space 28. Mounted to slide in each passage is an indicating plunger or contact member 30 through an opening 31 in which extends the awl in the corresponding opening 24. A spring 32 seated between the end of the plunger and a plug 34, shown as threaded into the outer extremity of the passage, exerts a constant tendency to force said plunger inwardly across the path of its awl. Each plunger is held normally inactive by its contact with the awl, which, while remaining unbroken or held in its usual position in the plate 20, extends at all times across the opening 24. If the end of an awl breaks, remaining in the heel H, as is indicated at *a* in Fig. 3, the retaining abutment furnished by this portion of the awl for the corresponding plunger will be absent, releasing said plunger, which will be forced by its spring into the space 28. The reciprocation of the portion of the broken awl which remains in the plate 20 may continue through an elongated opening 33 in the plunger, the correct alinement of this opening being maintained by a pin 35 projecting from the plate 22. Since some of the passages 26, as those at the bottom of the templet, are short, the plungers are cor-

respondingly reduced in length, so that, when they are thus moved into the space, they would alone not be properly guided. Each of the plungers is provided with a stem 36 movable through a bore in the alined plug 34. By the stems, the shorter plungers are effectively guided throughout their entire range of movement, and any plunger may be reset conveniently after the breaking of an awl and its replacement.

Mounted horizontally in the templet and insulated therefrom by a sleeve 38, is a member 40 having a contact portion 42 extending into the center of the space 28 and into the paths of the plungers, when these are released by the breaking of the corresponding awls. This contact member, which is common to all the plungers, furnishes one terminal of an electric circuit 44, the other terminal being grounded at 46 upon the templet or other portion of the machine in metallic contact with said templet. In the circuit is included an alarm or indicating device, as a vibrating bell 48, together with a source of current 50. When an awl is broken and its end left in the heel, the rearward travel of the plate 20 with the body of said awl frees the passage 26 across which this particular awl moves and thereby releases its plunger 30. This is pressed, by its spring 32, against the contact portion 42, completing the indicating circuit, current flowing from the source 50 through the circuit 44, the member 40 and its portion 42, the released plunger 30, the plate 22 and templet 14, to the other side of the circuit and through the bell 48 back to the current-source. This causes the bell to ring, at once notifying the operator of the breaking of the awl. He may thereupon stop the machine, put aside the heel containing the broken end, and replace the imperfect awl.

It will be obvious that my invention is applicable, not alone to heel-pricking machines, but to many pieces of apparatus employing movable tools which are likely to be broken or displaced in use.

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

1. The combination with a movable tool, of means for moving the tool, a movable member contacting with the tool, means for forcing the member against the tool, and indicating means controlled by the member when said member is released by the breaking of the tool.

2. In a heel-pricking machine, an awl, means for reciprocating said awl, guide means for the awl, a member, means for holding said member in contact with the working portion of said awl, and indicating means controlled by said member on movement permitted by the breakage of said awl.

3. The combination with a tool, of contact means bearing against the tool, means for mounting said contact means and allowing movement thereof upon a change of condition of the tool, and means operable on such change of condition of the tool as will allow movement of the contact means to indicate such change of condition.

4. The combination with a tool, of a member, means for mounting the member for contact with the tool and allowing movement when the tool is broken, and means operable on such movement to indicate such broken condition.

5. The combination with a tool, of a movable indicating member having at least a portion thereof normally visible, and means for mounting said movable indicating member to bear against the tool and allowing movement upon such change of condition of the tool as will allow said movement.

6. The combination with a tool, of a member, means for mounting the member for contact with the tool and allowing movement when the tool is broken, and an electric circuit controlled by the movement of the member and including an indicating device.

7. The combination with a tool, of a condition-indicating member, means for mounting said member for contact with the working portion of the tool and allowing movement thereof upon a change of condition of said tool which will permit such movement, and an indicating device governed by the member.

8. The combination with a tool adapted to penetrate material, a movable member, means for mounting said member for movement across the path of the tool, said movable member being normally restrained by the tool, and means controlled by the movement of the member toward the path of the tool for indicating a change of condition of the tool upon its withdrawal from the material to an extent allowing such movement.

9. In a heel-pricking machine, a reciprocatory awl, a plunger, means for mounting said plunger to normally contact with the awl, a member with which the plunger may contact upon the breaking of the awl, and a circuit having an alarm and including the plunger and member.

10. The combination with a plurality of tools and means for actuating said tools, of a movable member for each of said tools, means for mounting said member for movement relative to the tools and for normal restraint thereby, and an alarm device controlled by each of the movable members.

11. In a heel-pricking machine, a templet, a plurality of awls, means for mounting said awls for reciprocation in the templet, an indicating member for each awl, and means for mounting said indicating members, each member being normally held against movement by contact with its awl.

12. In a heel-pricking machine, a plurality

of reciprocatory awls, means for mounting said awls for reciprocatory movement, a templet in which the awls reciprocate, there being a passage in the templet intercepting the path of each awl, a contact member, means for mounting said contact member in the intersection of the passages, a plunger in each passage held normally out of contact with the member by engagement with its awl, and an alarm-circuit connected to the contact member and plungers.

In testimony whereof I have signed my name to this specification.

ELMER R. POPE.