

June 5, 1928.

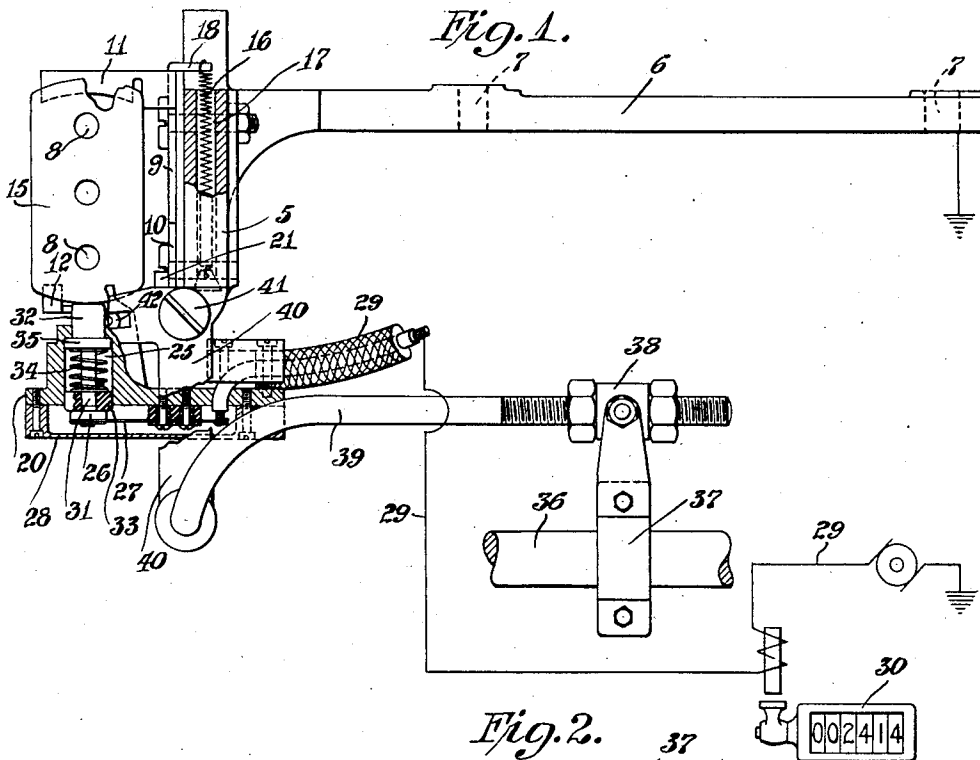
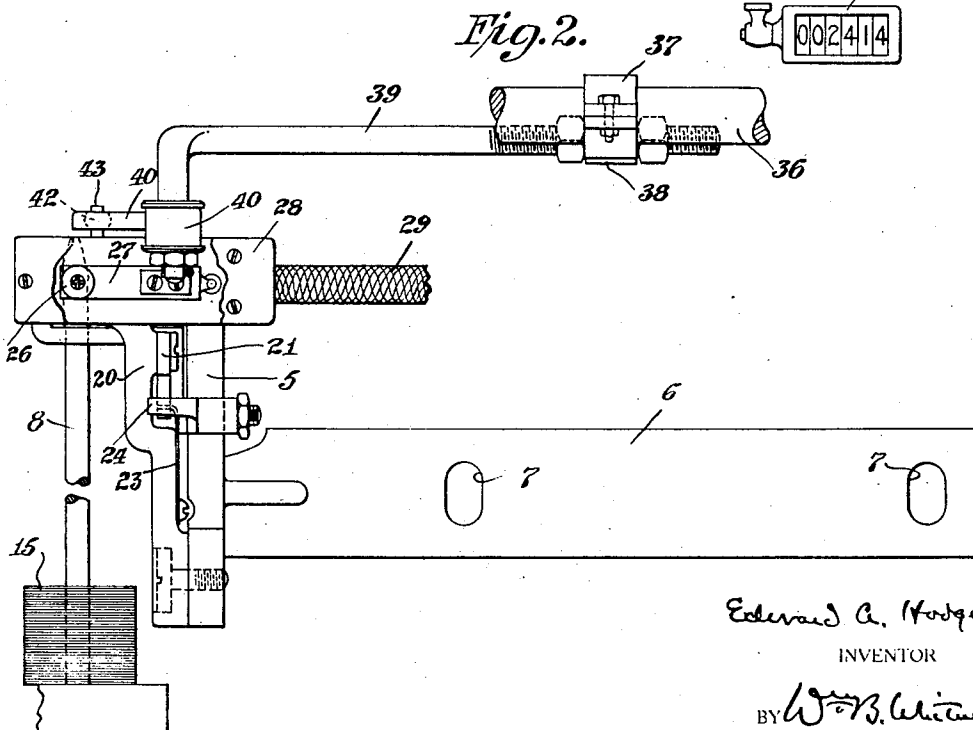
1,672,030

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APPARATUS FOR MEASURING PRODUCTION

Filed Feb. 10, 1927

2 Sheets-Sheet 1



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Fig. 3.

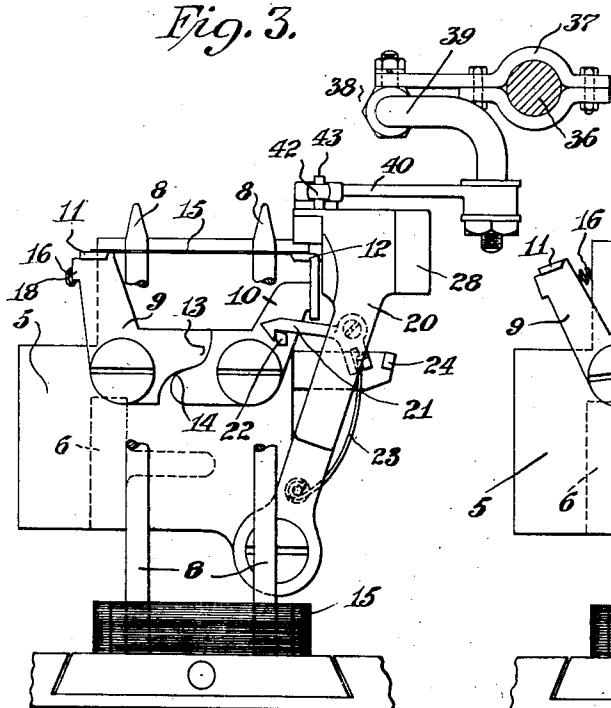


Fig. 4.

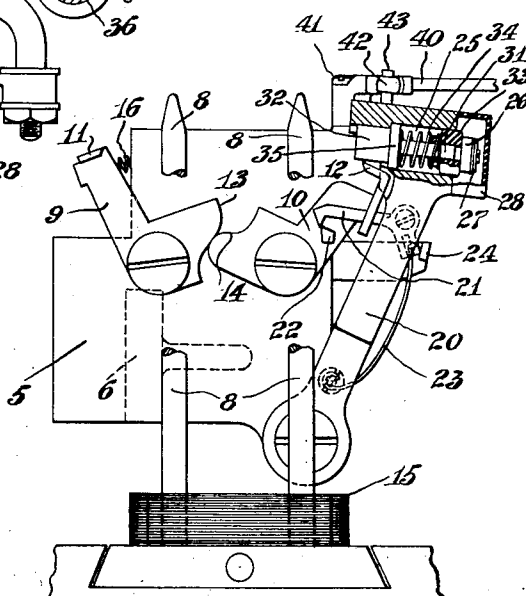


Fig.5.

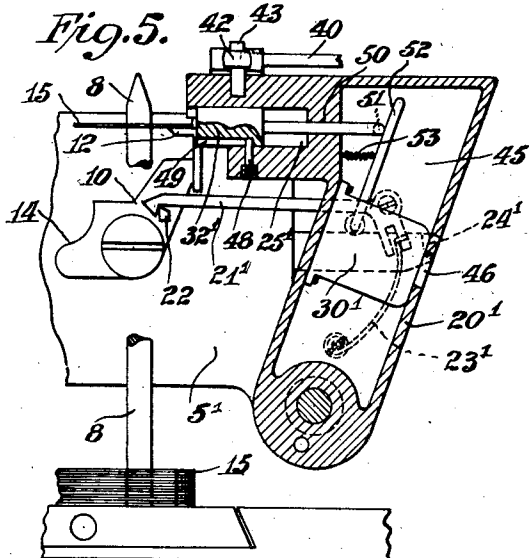
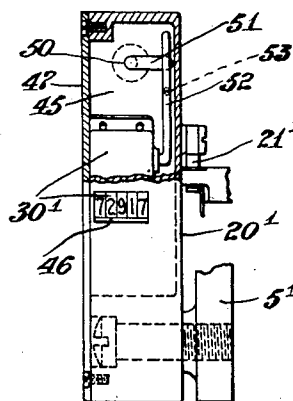


Fig. 6.



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APPARATUS FOR MEASURING PRODUCTION.

Application filed February 10, 1927. Serial No. 167,111.

This invention relates to apparatus for measuring the production of a shop machine, and the object thereof is to provide simple, efficient and reliable means for automatically registering and/or recording the number of the articles produced by the machine or the efficient operating and the idle and inefficient operating time of the machine.

To this end the invention consists, broadly stated, of mechanism which is operated by the machine and is adapted on each operative cycle thereof to temporarily arrest and then to release each article or group of articles as delivered by the machine and, in co-operation with the article or articles while so arrested, to actuate either a control switch in the actuating or control circuit of the production measuring device, conveniently located wherever desired, or a member operatively connected with a numbering or other device incorporated in and as part of the apparatus, thus avoiding any actuation of the switch or member and through it of the production measuring device whenever the machine is running but is not in actual productive operation.

Practical embodiments of the invention designed specifically for use with a machine of standard type for grinding and honing the blades of safety razors, to register the number of blades operated upon, are shown, by way of illustration and not of limitation, in the accompanying drawings, wherein—

Figure 1 is a view of the preferred form of the apparatus, largely in plan but partly in section, showing the means for its operative attachment to a honing machine, in proper position relative to the posts of the usual removable blade stack, and a diagram of the circuit of the actuating magnet of a counting device; Fig. 2 is a view showing the apparatus and the associated stack in side elevation; Fig. 3 is a view of the apparatus and the stack in front elevation; Fig. 4 is a view similar to Fig. 3 but partially broken away, showing parts of the apparatus in a different position; and Figs. 5 and 6 are views of portions of the apparatus showing, in vertical section and in side elevation respectively, a modification thereof.

Referring first to Figs. 1-4 of the drawings, 5 is a plate or support, and cast integral therewith is an arm 6 with elongated

openings 7 7 for the bolts by which the plate is adjustably attached to the frame of a honing machine in position just behind the posts 8 8 of the usual blade stack of the machine. The plate 5 carries, pivotally mounted upon its face, two bell-crank members 9 and 10 which constitute what may be designated as a collapsible bracket or table and a rock lever 20. The upper portion of the upwardly extending arms of the bell-crank members, shaped as shown, are bent over to provide the horizontal bracket arms 11 and 12, which extend forwardly past and outside of the posts of the stack. The lower horizontal arms of these two members terminate in reversed or complementary cyma curved ends the convex arcs 13 and 14 of which overlap and act as gear teeth. The convex arc 13 of the member 9 also serves in connection with the concave arc of the member 10 as a stop to limit the movement of the bracket arms 11 and 12 inwardly, towards each other, in a position close to the posts of the stack where they will intercept and support the ends of a razor blade 15 (see Fig. 3) deposited thereon by the machine; and these bracket arms are normally and yieldingly held in such operative position by a spring 16, which is housed in a cylindrical chamber 17 in the plate and is attached at one end to the plate at the inner end of the chamber and at the other end to a lug 18 at the back of the member 9. The rock lever 20 and the bracket member 10 are operatively connected by a pawl 21 pivotally mounted at the back of the former and a pin 22 fixed in the latter above its fulcrum. The toothed end of the pawl is yieldingly held by a spring 23 in position to ride over and engage the pin on the inward swing of the rock lever and is tripped out of engagement therewith when its tail strikes the stop 24 as the rock lever reaches the limit of its outward movement. Thus, on the outward swing of the rock lever, the members 9 and 10 will first be rocked apart, to spread the bracket arms to release the razor blade if any thereon, and will then in turn be released and spring back into position to receive the next blade delivered to the stack.

The rock lever 20 has at its upper end a head which is bored to provide an open-ended cylindrical chamber 25, of reduced size at its inner end, with its axis substantially at the intersection of planes passing

through the posts of the stack and the two bracket arms respectively, and when the rock lever is swung inwardly, toward the stack, the inner end of the head passes into an opening cut out for the purpose in the adjacent bracket arm 12. This head carries the contacts of the control switch. The fixed switch contact 26 is yieldingly supported adjacent the outer end of the chamber 25 by a spring 27, of phosphor bronze or other suitable conducting material, which is mounted upon a rearward extension at the outer side of the head, suitably insulated therefrom, and is enclosed by a removable cap 28; and this contact is electrically connected with the circuit wire 29, which as here shown leads from a source of current supply through the coil of the actuating magnet of a number registering device 30 and is clamped to the back of the extension and then carried through an opening therein and soldered to the rear end of the spring 27. The movable contact 31 is carried at the end of a plunger 32, which is mounted to slide to a limited extent within bearings provided by the reduced inner end of the chamber in the head and a bushing 33 of insulating material set into its larger outer end, and is normally held in open position, out of contact with the fixed contact, by a coil spring 34 which yieldingly presses the plunger inwardly and holds an annular collar 35 thereon seated against the shoulder in the chamber. This contact may be grounded as shown through the supporting plate, and the frame of the machine, or it may if desired be connected directly back by wire to the other side of the source of current supply.

The rock lever 20 is here actuated by the rod 36 of the honing machine, which rod during each operative cycle of the machine moves forward after the edges of a blade have been honed on one side to turn the blade over and then is immediately withdrawn. The necessary connection is provided, as shown, by an arm 37 which is clamped to the rod and at its outer end is pivoted to a block 38 secured, between two adjusting nuts, on the rear end of a connecting rod 39, which rod in turn is pivoted at its forward end to the long arm of a bell-crank lever 40 fulcrumed upon a pin 41 fixed in the upper edge of the plate 5, the slotted short arm of the lever being operatively connected with the head of the rock lever 20 by means of a ball 42 sliding in the grooved sides of the slot and turning and sliding axially upon a pin 43 fixed on the head.

The operation of the switch, constructed as above described, is as follows: The rod 36, as stated, reciprocates forward and back during each operative cycle of the honing machine—that is to say, during the finish-

ing of each razor blade—and in its travel rocks the head of the rock lever 20 from the limit of its inward to the limit of its outward movement and back again. Thus, after a razor blade has been honed on one side and as it is being turned over preparatory to the honing of its other side, the rock lever 20 is swung inwardly into operative engagement with the bracket member 10, and there is at once swung back, or outwardly, and by such movement rocks the bracket members, to spread their arms, and then releases them, allowing them to spring back to operative position. This action is repeated with each operation of the machine. It is obvious, however, that the switch will not be actuated by the movement of the rock lever if there is no razor blade in place upon the bracket arms 11 and 12 to engage and arrest the movement of the plunger 32, on the inward swing of the head, and so effect the closing of the switch contacts. Hence, when a machine is started up there will be no actuation of the switch and through it of the counter by the rocking of the rock lever during the honing of the first blade, each blade being counted while the next succeeding blade is being finished, and neither switch nor counter will be actuated by the running of the machine so long as it is not in productive operation and delivering blades to the stack.

In the modification illustrated in Figs. 5 and 6, the switch contacts are omitted and the numbering device 30' is mounted upon, or within, the rock lever 20' and is actuated directly by the plunger 32'. The rock lever is here hollowed out to provide a chamber 45, for the counter, with window 46 through which the figures of the counter can be read and a removable front cover plate 47. The plunger 32' reciprocates within the chamber 25' in the head of the rock-lever, being held from turning by a pin 48 which projects into a key-way 49 and also serves by engagement with the end of the key-way to hold the plunger within the head and to limit its forward movement therein. The reduced rear end of the plunger passes through an opening 50 in the rear wall of the chamber 25' and its outer end, within the chamber 45, is bent about at right angles to provide an arm 51 which operatively engages the actuating lever arm 52 of the counter, a spring 53 serving to hold the arm of the counter in contact with the arm 51 and to return the plunger to its extreme forward position within the head when moved therefrom. The operation is substantially as in the form first described, it being obvious that on the forward or inward swing of the rock-lever the plunger will be reciprocated to actuate the counter only when there is a razor blade held in the path of its movement on the posts of the stack.

It is to be understood that the mechanism described constitutes the unit of a system, being intended for use with each of any number of machines whose production is to be measured; and, further, that in the form comprising an electric switch is equally adapted for the control of the circuits of apparatus for registering and/or recording the efficient operating and the idle and inefficient operating time of a machine as for controlling the actuating circuit of a numbering device as here illustrated, the counters or other registers or recorders of the machines being located and grouped together where and as desired. It is also to be understood that the mechanism may be variously modified in its several details and, with or without such modification, may be used in the measurement of the production of many machines other than honing machines.

What I claim as new, and desire to secure by Letters Patent, is—

1. In apparatus of the character disclosed, mechanism adapted for operative connection with a shop machine comprising a movable member carrying an element yieldingly held in a definite position relative thereto and means operable by the machine adapted to temporarily arrest and hold articles as successively discharged from the machine and simultaneously therewith to so move the member as to force the element carried thereon against an article so held and thereby effect a change of its position relative to said member.

2. In apparatus of the character disclosed, the combination of an electric switch, means adapted to temporarily arrest the movement of articles successively discharged from a shop machine, and means adapted to be actuated by the machine and operative when so actuated and in cooperation with each article discharged therefrom while so arrested in its movement to actuate the switch.

3. Apparatus of the character described comprising a movable member, means for connecting the member with a shop machine whereby it will be moved forward and back during each operative cycle of the machine, an element carried by the member and normally and yieldingly held in one position thereon, and means for temporarily holding articles as successively discharged from the machine in the path of the forward movement of said element to thereby arrest it and so effect a change in its position relative to the carrier member.

4. Apparatus of the character described comprising a movable member, means for connecting the member with a shop machine whereby it will be moved forward and back once during each operative cycle of the machine, an electric switch carried by the member, and means for temporarily holding each article discharged from the machine in the

path of the movable switch member to thereby effect the actuation of the switch.

5. Apparatus of the character described comprising a movable member carrying mounted thereon the contacts of an electric switch, means for operatively connecting said member with a machine whereby it will be moved forward and back once during each operative cycle of the machine, and means for holding articles as successively discharged from the machine in the path of the movable switch member to thereby effect the actuation of the switch.

6. Apparatus of the character described comprising a supporting plate adapted to be fixed in position adjacent a shop machine, a member movably mounted upon the plate and normally positioned to receive and support articles discharged from the machine, a second member mounted on the support to move from and towards said first member, means operative during the outward movement of said second member to so move said first member as to release an article supported thereon and then allow the member to return to its normal position, an element yieldingly carried by said second member in position to engage an article supported on said first member during the forward movement of said second member to thereby shift its position relative thereto, and means for operatively connecting said second member with the machine whereby it will be reciprocated back and forth once during each operative cycle of the machine.

7. Apparatus of the character described comprising a supporting plate adapted to be fixed in position adjacent a shop machine, a member movably mounted upon the plate and normally positioned to receive and support articles discharged from the machine, a second member carrying an electric switch mounted on the support to move from and towards said first member, means operative during the movement of said second member in one direction to so move said first member as to release an article supported thereon and then allow the member to return to its normal position, means operative during the return movement of said second member by engagement with an article supported on said first member to effect the actuation of the switch, and means for operatively connecting said second member with the machine whereby it will be reciprocated back and forth once during each operative cycle of the machine.

8. Apparatus of the character described comprising a support adapted for attachment to a shop machine, a pair of bracket arms movably mounted upon the support and normally and yieldingly held in position to receive and support articles discharged by the machine, a member mounted on the support adjacent one of said bracket

arms to move from and towards the same, means operative during the outward movement of said member to so move the bracket arms as to release an article supported thereon and then allow them to return to normal position, an element movably mounted upon said member and normally and yieldingly held in position thereon to engage an article on the bracket arm during the inward movement of the member and thereby be arrested in its own movement, and means for operatively connecting said member with a machine whereby it will be reciprocated outwardly and back during each operative cycle of the machine.

9. Apparatus of the character described comprising a support adapted to be attached to a shop machine, a pair of bracket arms movably mounted upon the support and normally and yieldingly held in position to receive and support articles discharged from the machine, a member carrying the contacts of an electric switch mounted on the support adjacent one of the bracket arms to move from and towards the arm, means operative during the outward movement of said member to so move the bracket arms as to release an article supported thereon and then allow them to return to normal position, means operative by engagement with an article on the bracket arms during the inward movement of said member for actuating the switch contacts, and means for

operatively connecting the said member with the machine whereby it will be reciprocated outwardly and back once during each operative cycle of the machine.

10. In combination, a plate support adapted for attachment to a machine for honing razor blades in position back of the posts of its stack, a pair of bracket arms pivotally mounted upon the face of the plate to extend past and outside of the two stack posts and normally held in position to intercept and support the ends of a blade deposited upon the posts by the machine, a rock-lever pivotally mounted upon the support to swing from and towards one of the bracket arms, an operative connection whereby during the outward movement of the rock-lever the bracket arms will first be rocked apart to release the blade and then released to return to normal position, a pair of normally open switch contacts carried by said arm, an element associated with the movable switch contact adapted during the inward swing of the rock-lever to engage the end of a blade held on the supporting arms and to arrest the movement of the contact at a point where it will be engaged by the second contact, and means for operatively connecting the rock-lever to the honing machine whereby the lever will be rocked outwardly and back during each operative cycle of the machine.

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