

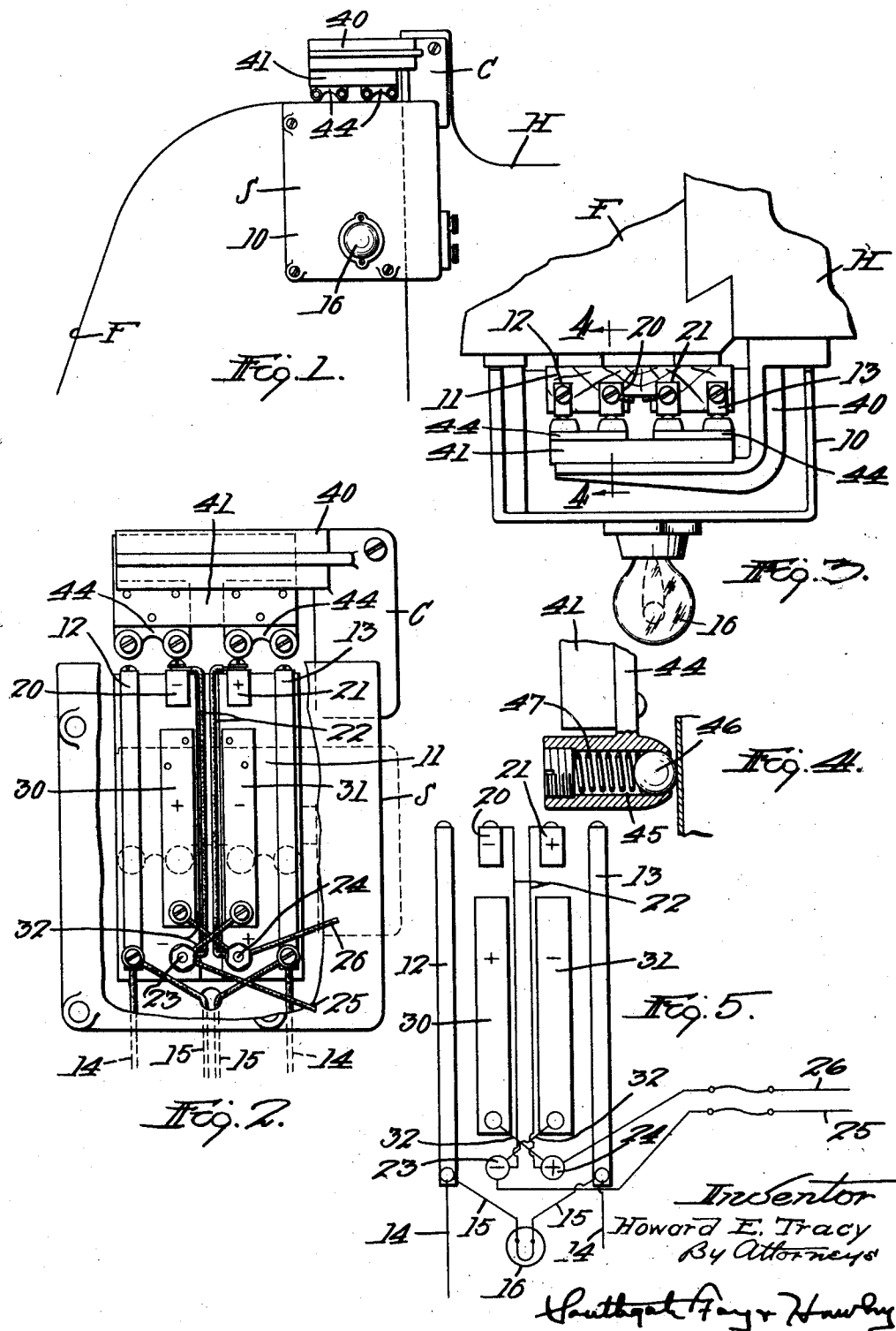
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ELECTRIC SWITCH FOR MAGNETIC CHUCKS

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ELECTRIC SWITCH FOR MAGNETIC CHUCKS

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This invention relates to an electric switch particularly designed for use in connection with magnetic chucks.

It is the object of my invention to provide an improved form of switch by which a chuck may be magnetized and demagnetized, the operation of which is preferably controlled by the movement of some part of the machine to operative or inoperative position.

A further object is to provide a switch for such purposes, so designed that no flexing of wires or other connections is occasioned by relative movement of the machine parts during the loading or unloading of the chuck or during the operation of the machine.

My invention further relates to arrangements and combinations of parts which will be hereinafter described and more particularly pointed out in the appended claim.

A preferred form of the invention is shown in the drawings, in which

Fig. 1 is a side elevation of a portion of a grinding machine having my invention applied thereto;

Fig. 2 is an enlarged side elevation of my improved switch with the casing broken away to show the interior construction;

Fig. 3 is a plan view of my improved switch;

Fig. 4 is a detail sectional view, taken along the line 4—4 in Fig. 3; and

Fig. 5 is a diagrammatic view showing the electrical connections.

Referring to the drawings, I have shown my improved switch S mounted on the frame F of a grinding machine or other similar machine tool. The contact device C which co-operates with the switch S is shown as mounted on a vertically adjustable head H adapted to support a grinding wheel or other driven tool.

My improved switch S comprises a casing 10 enclosing a base or block 11 preferably formed of wood or other insulating material. A pair of elongated contact strips 12 and 13 are mounted at the opposite edges of the block 11 and are connected at their lower ends to wires 14 and 15.

The wires 14 extend to the magnetic chuck

to be controlled and the wires 15 extend to a small electric bulb 16 adapted to indicate when the magnetic chuck is energized. The wires 14 and 15 are arranged in parallel, so that when the chuck is magnetized the bulb 16 will be lighted.

A pair of demagnetizing contact plates 20 and 21 are secured at the upper end of the base 11 and are connected by wires 22 to a pair of terminals 23 and 24 at the lower end of the base 11. Line wires 25 and 26 are connected to the terminals 23 and 24 and extend to a suitable source of direct current supply, such as a battery, not shown.

The terminal 24 is indicated as a positive terminal and the terminal 23 as the negative terminal. Consequently the demagnetizing contact plate 21 will be positive and the plate 23 will be negative.

An additional pair of magnetizing plates 30 and 31 are connected by cross wires 32 to the terminals 23 and 24, the plate 30 being connected to the positive terminal 24 and the plate 31 to the negative terminal 23.

The contact device C comprises a frame or support 40 firmly secured to the upper portion of the wheel head or other movable machine member H. The support 40 is provided with a plate 41 of insulating material to which a pair of double contact members 44 are secured. Each member 44 comprises a casting having spaced parallel sockets 45 (Fig. 4) to receive ball elements 46 pressed yieldingly outward by coil springs 47. The balls 46 are so positioned that one of the balls of each double contact member engages one of the contact strips 12 or 13 and the other ball successively engages one of the demagnetizing plates 20 or 21 and one of the magnetizing plates 30 or 31.

Operation

Having described the construction of my improved switch, the operation and advantages thereof will be easily understood. In the extreme upward or inoperative position of the head H, the contact members 44 are beyond the range of the switch S and are thus in inoperative position.

As the head H is moved downward to

bring the wheel into contact with the work, one of the balls 46 of each contact member engages one of the strips 12 or 13 and the other ball of each contact member momentarily engages one of the demagnetizing plates 20 or 21 and then engages one of the magnetizing plates 30 or 31.

The contact strip 12 is made positive by the latter contact and the contact strip 13 becomes negative. The contact members remain in contact with the magnetizing plates 30 and 31 so long as the head H is in lowered or operative position.

When the work is completed and the head is raised to permit unloading and reloading of the chuck, the balls 46 pass from engagement with the plates 30 and 31 to momentary engagement with the demagnetizing plates 20 and 21. Such contact causes the strip 12 to become negative and the strip 13 to become positive, thus reversing the direction of current through the magnetic chuck and demagnetizing the chuck so that the work may be removed.

Continued upward movement of the heads separates the balls from all of the contact strips and plates. The contact with the plates 20 and 21 is thus relatively short, and the demagnetizing current does not flow long enough to remagnetize the chuck by continued reverse flow.

When the head H and contact device C is lowered, the momentary engagement of the demagnetizing plates 20 and 21 produces no particularly useful effect, but on the other hand, produces no objectionable effect, and such contact is merely negligible.

Having described the operation of my invention, it will be seen that the desired circuits are made and broken entirely by movement of the head H to operative and inoperative position and that the use of separate manually-operated mechanism is entirely avoided. Furthermore, it will be evident that the switch S and all parts contained therein remains at all times in fixed position on the frame F, so that no flexing of connecting wires occurs. This has been found objectionable in certain previous types of switches, as repeated flexing of the wires eventually causes breakage.

Having thus described my invention and the advantages thereof, I do not wish to be limited to the details herein disclosed, otherwise than as set forth in the claim, but what I claim is:—

An electric switch for a magnetic chuck comprising a pair of elongated contact strips connected to said chuck, a pair of magnetizing contact plates of opposite polarity, a pair of demagnetizing contact plates of reversed polarity with respect to said magnetizing plates but aligned therewith, all of said contact strips and plates being mounted in fixed relation on one part of a machine tool, and a

pair of double contact members mounted on another and relatively movable part of said machine tool, said double contact members each being movable in unison and being operative in one extreme position to connect one of said contact strips to one of said magnetizing plates, whereby the chuck is energized, and said double contact members being effective by continued movement to further positions to connect said contact strips to said demagnetizing plates to demagnetize the chuck and to thereafter break all connections to said contact strips and chuck.

In testimony whereof I have hereunto affixed my signature.

HOWARD E. TRACY.