IN THE WORKSHOP

by "Duplex"

No. 76.—*A Small Power-driven Hacksaw Machine

WHERE simplicity is desired, it will be sufficient for operating the machine if the motor is wired direct to the electric power circuit and controlled in the ordinary way with a tumbler switch.

It will, however, add greatly to the convenience of working if a small on-off switch is fitted on the machine itself and, in addition, an automatic cut-out switch is used to switch off the motor as soon as the saw teeth reach a point a little below the level of the vice work-face. This automatic switch will enable the machine to be left unattended while working, with the knowledge that the driving motor will be stopped on completion of the cut. Furthermore, by fitting the main switch and the control button of the automatic switch at the near end of the machine, the hands are kept well clear of the saw mechanism and any live electrical connections.

*Continued from page 687, "M.E.," November 2, 1950.

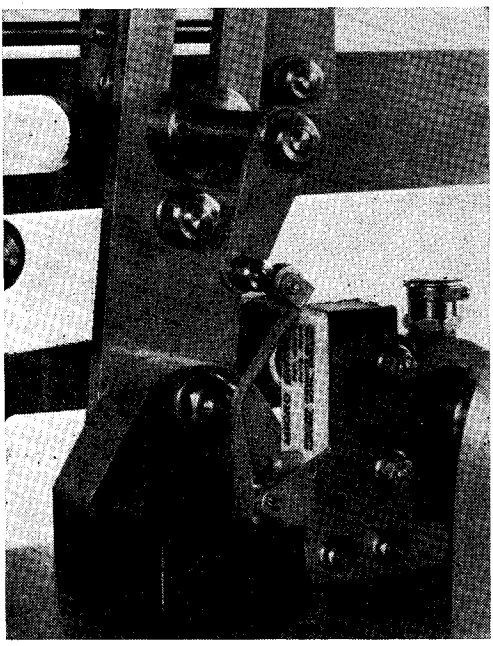
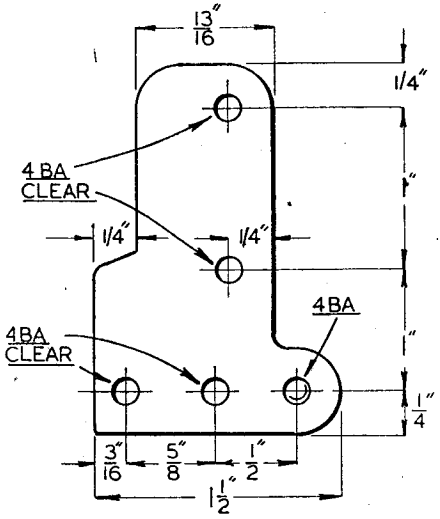


Fig. 47. The Burgess switch fitted in position

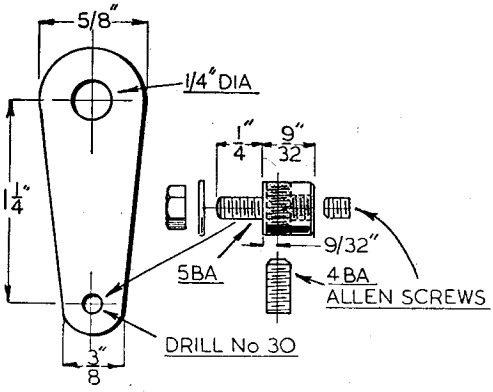
The Cut-out Switch

The switch used for this purpose in the a.c. circuit is the Burgess BRSX microswitch fitted with a base mounting and a CA type actuator for operating the switch mechanism.

This type of switch has a reset button for again closing the circuit after it has been broken, and, as will be seen, a remote control



Left—Fig. 48. The switch bracket



Above—Fig. 49. The drop-arm attached to the guide-arm shaft

gear is fitted to perform this duty. The method of mounting the Burgess switch is illustrated in Fig. 47, where it will be seen that the base mounting of the switch carrying the actuator arm is secured to a bracket which, in turn, is fixed to the guide-arm base bracket casting by means of two screws engaging in the tapped holes previously drilled in the latter part. The dimensions of the attachment bracket are given in Fig. 48. Before going further, it should be pointed out that the reset button and its operating gear are arranged to lie along the centre-line of the baseplate of the machine, and it may, therefore, be found necessary to fit spacing washers between the switch attachment bracket and the casting in order to get the correct setting.

As will be seen in Fig. 47, the actuator arm of the Burgess switch is moved by a drop-arm fitted to the end of the guide-arm shaft attached

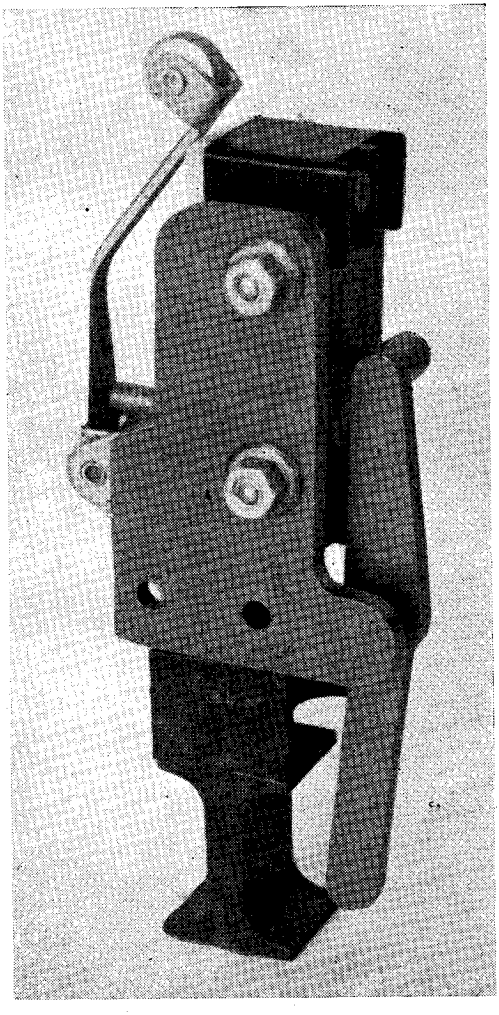


Fig. 50. The Burgess switch with its bracket and reset lever

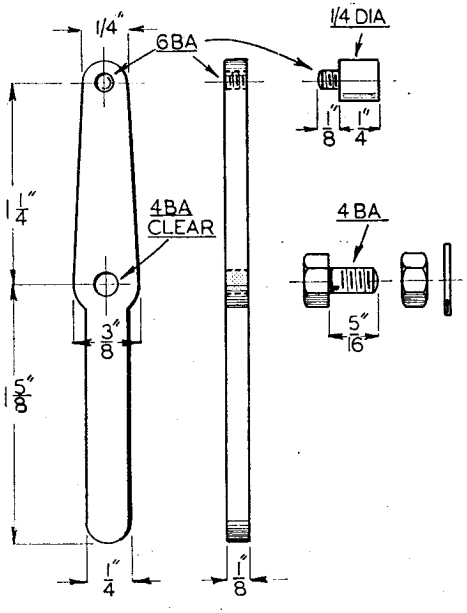


Fig. 51. The reset lever with its parts

to the saw beam. It follows, therefore, that, as the beam falls, the downward movement of the drop-arm will cause the actuator to operate the switch and so break the circuit.

It will be remembered that, as shown in Fig. 32, the projecting end of the guide arm shaft is shouldered and threaded $\frac{1}{4}$ in. B.S.F., and it is here that the drop-arm is attached by means of a nut and washer. The detailed construction of the drop-arm and its fittings is shown in Fig. 49, and it will be apparent that the contact screw of the arm is adjustable over a wide range in relation to the roller contact fitted to the actuator arm; there will, therefore, be no difficulty in setting the switch to break exactly at the point required.

The Reset Mechanism

The photograph, Fig. 50, of the switch detached from the bracket casting shows the way in which the reset lever is mounted on the switch bracket for the purpose of depressing the button that resets the switch. The dimensions of this lever and its parts are given in Fig. 51. The lower end of the reset lever, which can be seen in Fig. 52, passes through a slot, formed in the baseplate of the machine, to enable the lever to be moved by the actuating mechanism fitted to the under side of the base. The photograph, Fig. 52, of the under side of the baseplate gives a general view of the operating mechanism, and the constructional details are shown in Fig. 53; the parts are identified by similar lettering in the two illustrations. When fitted as shown, the control-rod lies both on the centre-line of the baseplate and parallel with its lower surface; this enables the bearing for the rod to be marked-out and drilled at the centre of the upper of the

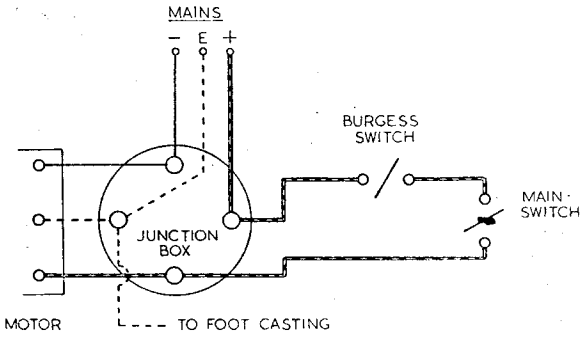


Fig. 54. Wiring diagram

just sufficiently to prevent slip, for further tightening will merely increase the bearing friction and lead to unnecessary wear.

Keep all bearings well lubricated with thin oil of good quality; this is especially important for the carriage slides, as failure of lubrication may result in scoring of the contact surfaces. To keep the machine and the bench top clean, it is advisable to use a swarf tray that will slide partly under the baseboard; the chips accumulating on the machine can then be swept into the tray with the brush kept at hand for the purpose.

A Small Addition

Some difficulty may be experienced in forming an oiltight joint where the nut clamps the countershaft to its bracket casting. This can easily be overcome by fitting a cap nut in place of the plain nut shown in Figs. 7 and 8.

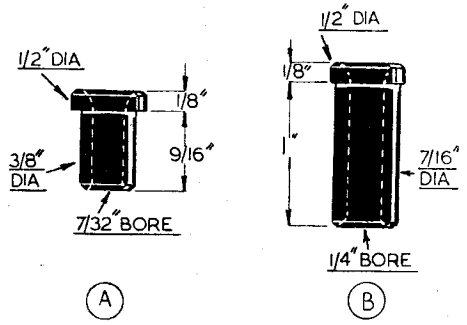


Fig. 56. Wiring brushes. (A) for the baseplate; (B) two required for the baseboard

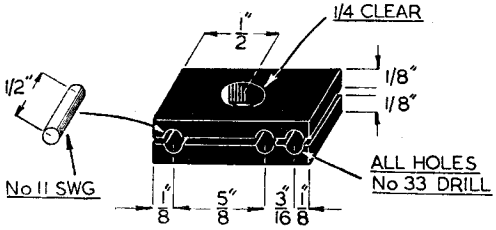


Fig. 57. A wiring cleat with its spacing-rod

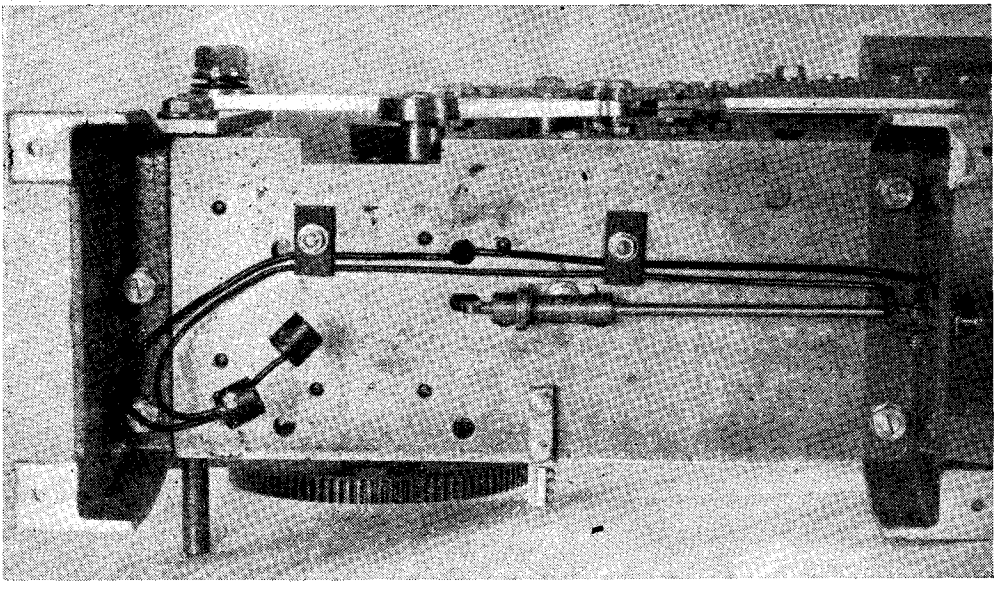


Fig. 58. Showing the wiring under the baseplate, also the reset mechanism

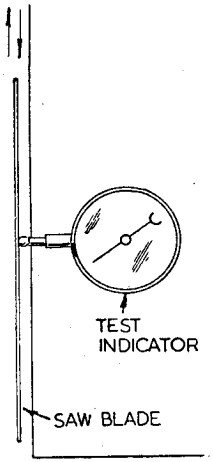


Fig. 59. Testing the alignment of the saw blade

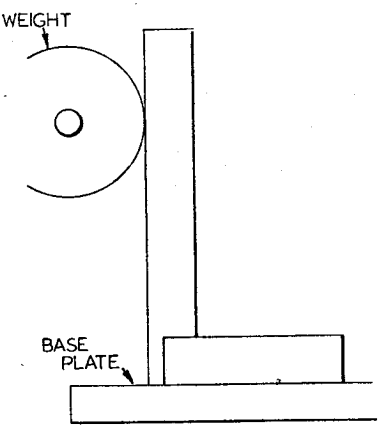


Fig. 60. Testing the alignment of the beam pivot bearing

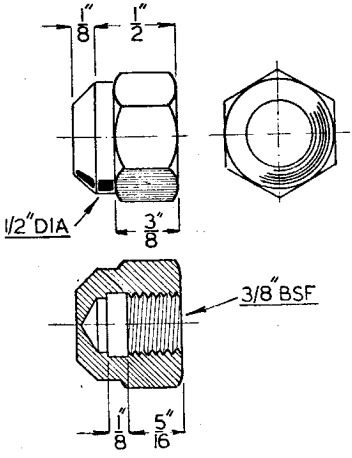


Fig. 61. The cap-nut fitted to the countershaft

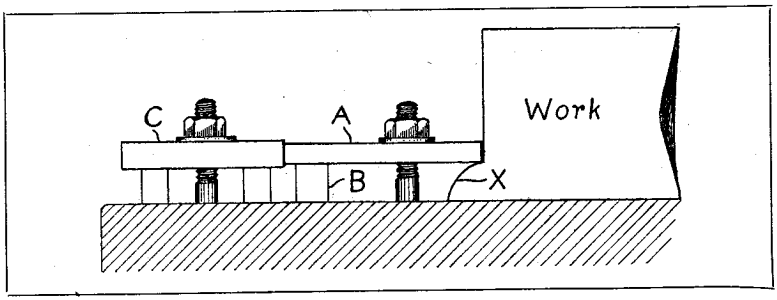
A suitable nut for the purpose is illustrated in Fig. 61. When threading this nut, a second tap was used, that is to say one having its leading threads tapered ; so to enable the nut to engage fully, without binding on the threads, a small boring tool was employed to chamber the bore as represented in the drawing.

In a following instalment a description will be given of this machine in a simplified form adapted for attachment to the lathe bed and driven from the lathe mandrel.

(To be continued

A Clamping Hint

OFTEN a job comes along to be machined on the lathe faceplate or on the shaping machine, which is difficult to clamp down due to the absence of any square ridges or ledges. Sometimes the lathe dog chucks can be used to make the work quite secure for machining operations, due care should be paid to one or two points. First, make quite sure the packing-piece *B* is not longer than the height of the projection *X*. The clamp *A* should be level, or, if



and, if so, the problem is solved; but in many cases even this method cannot be applied.

The accompanying illustration indicates part of a job which contains a number of rounded projections, as shown at *X*, and the work has to be clamped down on these pieces. In order anything, sloping slightly down on to the packing.

Behind each clamp, bolt down a stop-piece *C*, making quite sure it is in good contact with the end of *A*. This stop will tend to prevent the holding-down clamp slipping off the work while machining operations are in progress.—W. J. SAUNDERS.