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Extension feed, rheostat and tension arm

By H. D. WOODWARD

THE extension feed bracket is made of $\frac{1}{8}$ in. steel plate, with $1\frac{1}{2}$ in. $\times$ $1\frac{1}{2}$ in. $\times$ $\frac{1}{8}$ in. angle plate riveted to this to enable the whole to be clamped at a suitable position on the front panel for feeding-off the wire when winding. A roller made of tufnol or ebonite is turned in the lathe, and is drilled centrally to take a length of silver steel a force fit. The complete roller runs between two pillars of $\frac{1}{4}$ in. x $\frac{1}{4}$ in. mild steel.

The pillars are drilled a clearance hole $\frac{3}{16}$ in. to take the $\frac{3}{16}$ in. silver steel spindle a $\frac{1}{4}$ in. down from the top of the pillars. Drill right through. Oil holes are also drilled from the top to break through into the $\frac{3}{16}$ in. bearing holes, previously drilled. The other ends of the pillars are drilled and tapped either 4 BA or 2 BA for clamping to the bracket.

After the pillars have been made, fit them to the ends of the roller with intermediate washers and measure the fixing centres distance. Transfer this measurement to the bracket, centre punch, drill through with a pilot drill, and then with a clearance drill. Assemble the roller and pillars and clamp with suitable screws to the bracket. The assembled roller and bracket are placed in position on the front panel and the $\frac{1}{4}$ in. fixing hole spotted on the panel. This is drilled $\frac{1}{4}$ in. clearance to enable a fin. x 20 t.p.i. Whit. nut and bolt to be passed through for clamping the extension feed-off bracket when required.

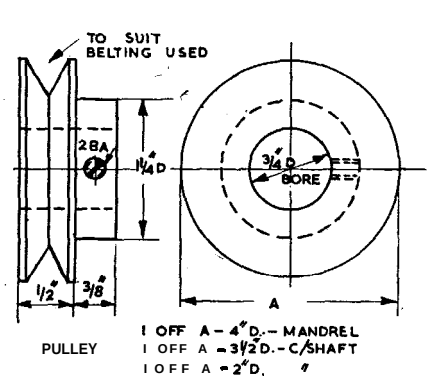
The front panel in my case was cut away to take a piece of tufnol measuring 6 in. x 3 in. x $\frac{1}{8}$ in. to fix the warning light and the rheostat. The thickness of the wood presented a problem for these items, but on completing the winder, I found it was really non-existent and that it could have been overcome by increasing the length of the rheostat spindle. The warning light bulb-holder was actually held in a bored hole through the wood. Its dome, or jewel., could also be screwed by its thread into the front of the panel wood, and held. The extreme control knob is the "forward"/"reverse" switch. This is quite a simple item to make, as long as the contacts make and break adequately. This applies to a low volt motor, where the flow is in the region of about 5 amp. or more. Otherwise the switch or control will heat up.

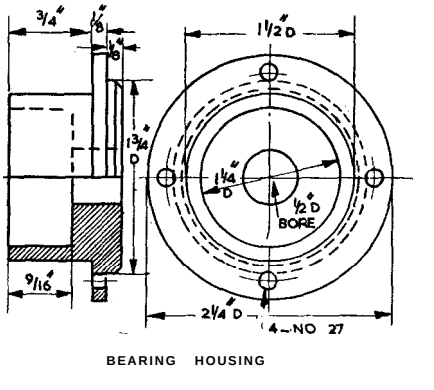
The rheostat can be constructed of any materials, as long as those for the stud-board are insulated and of a reasonable thickness. The stud-arm should be made first, and from this the radius pitch circle scribed on to the stud-board 'in a semi-circle, or arc. This will give the relative positions for the brass studs (brass bolts in this case). The holes are drilled for clearance, or they can be tapped 4 BA for brass screws.

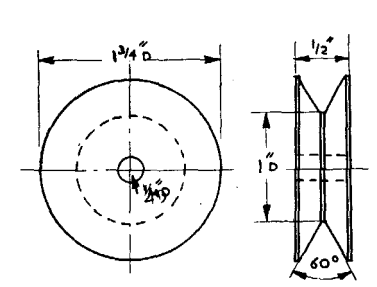
The stud screws are held in turn in the three-jaw to have their slots turned off. Take fine cuts with a knife tool, or the heads will roll off, particularly if they are of brass. Cheesehead screws are the best, but if these are not available, roundheads or the like will do. The studs should be sufficiently far apart as not to interfere with the brass washers and nuts at the rear, or the wire connections.

The former for the resistance is a piece of asbestos. Mica could be used, but a separate insulating strip of tufnol or bakelite would be needed for a connecting post for the wire terminations of nuts and bolts. By using asbestos, the resistance wire and the terminal bolts are on one piece. The resistance wire is a 30 in. length of 27 gauge element wire of the type to be found on electric tire-elements. The asbestos is marked on its edges with a rule and a miniature saw. Marks roughly about $\frac{1}{8}$ in. are made along one side,. and the other side the relative positions must be advanced a little to enable the resistance-wire to be spiralled.

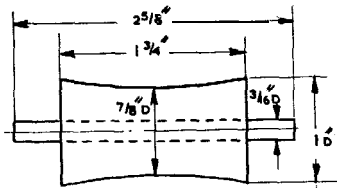
Before winding on the wire, mark the positions for the seven terminals, making sure they are out of the way of the wire. Start winding the-wire when the terminals have been fixed in position. Loop it on and once



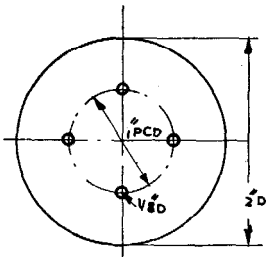




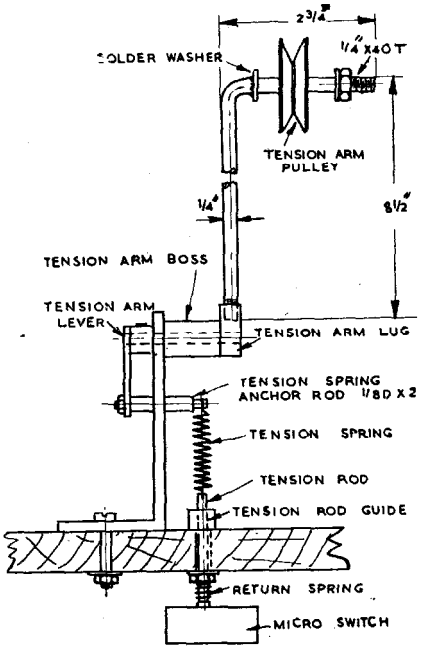
TENSION ARM PULLEY

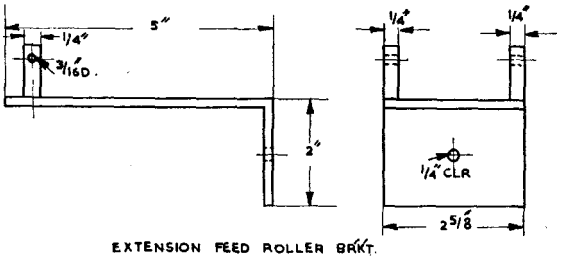


EXTENSION FEED ROLLER



END CAP C/SHAFT. BEARING



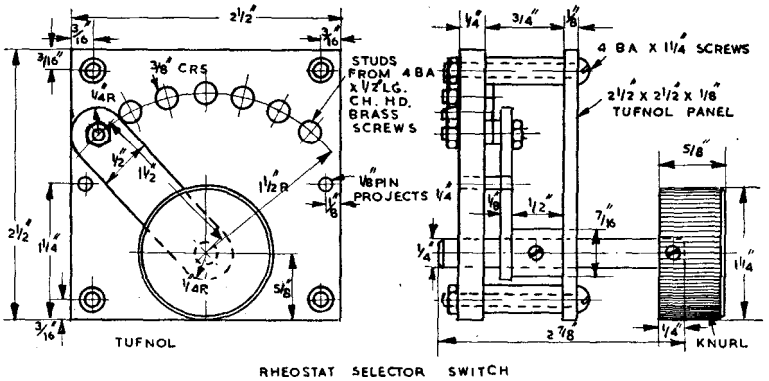


EXTENSION FEED ROLLER BRKT.

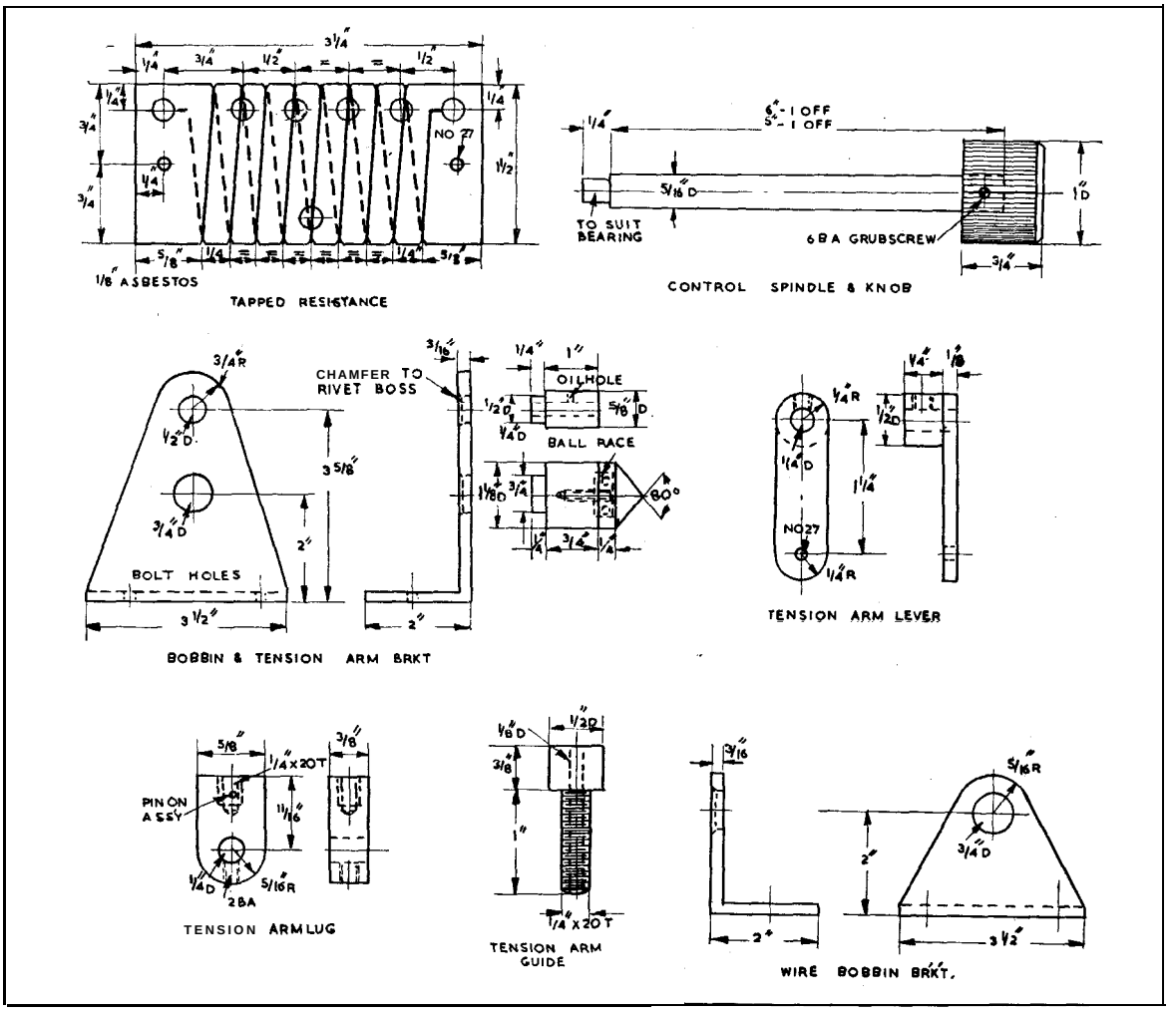
ound each intermediate screw and anchor the ends to the end screws. The amount of wire required will vary according to the motor, and can only be found by trial and error. The same applies to the length or distance between each terminal for the motor speed drop. The last position of the stud arm should be an "off" position. This will save a switch for "on"/"off," although one could be fitted and may be found quicker to use in an emergency.

The "forward"/"reverse" control is straightforward, and a pip or an indentation could be made for the arm to engage centrally in an "off" position also. The control is made in the same fashion as the rheostat, with terminals provided for wiring later.

It is advisable to make a termination block for connection purposes. It can be fixed within the base of the machine with woodscrews and spacers



RHEOSTAT SELECTOR SWITCH



or washers, to be proud of the woodwork. Tufnol or bakelite can be used.

The automatic cut-out arm-or tension arm-is not a difficult item to make, and can be fabricated. It is not essential to the machine, but it will be appreciated when wire gauges get above 28 s.w.g., when breaks are common at high speed. I was certainly glad of its use when I had to strip down a few ex-GPO relays-the wire was almost " micro," and I wanted to re-wind them for use in my 36in. launch.

The tension arm should be made complete, and temporarily fixed in position to show where the tension guide and its rod will be positioned on the base of the machine. This position will be more or less governed by the micro-switch underneath. It is well to make sure that the micro-switch *can* be fixed where the arm is temporarily placed, for the tension rod to operate the micro-button. The tension rod in this circuit is allowed to depress the button in its rest position. The circuit then being made, the operation of the arm swinging forward and down releases this pressure and the other side of the micro-switch comes into circuit to make the warning light circuit. It will be understood that the " rest " position is the motor circuit made.

The operation of the micro-switch may be reversed, that is, certain types of these switches are " made " open, and " broken " shut. The type of switch used in this circuit is two-way. So it is well to test the switch with a battery and bulb before fixing it in position. Most of the micro-switches on sale will carry a current of 5 amp., if the motor to be used is a low voltage, and rather heavy on consumption. A relay can be made and wound on the machine for 12 or 24 v., and put into circuit with the micro-switch to carry excess motor current away from the micro-contacts. The relay would have heavier contacts provided to carry motor current.

The motor on my machine is an intermittent-rating job. I have had it for seven or eight years. It has been used for every conceivable job, heavy demands being put on it for periods of up to half-an-hour, and the temperature hasn't been alarming.

The lower portion of the tension rod under the base of the machine has a small spring of two or three coils, to ensure a slight pressure on the micro-button. It is a matter of trial and error to obtain the correct pressure. The tension spring, which is anchored to the top of the rod, cold be furnished with an adjustable screw for different tensions, and a knurled locknut to lock it in position.

★ *To be continued on May 12*