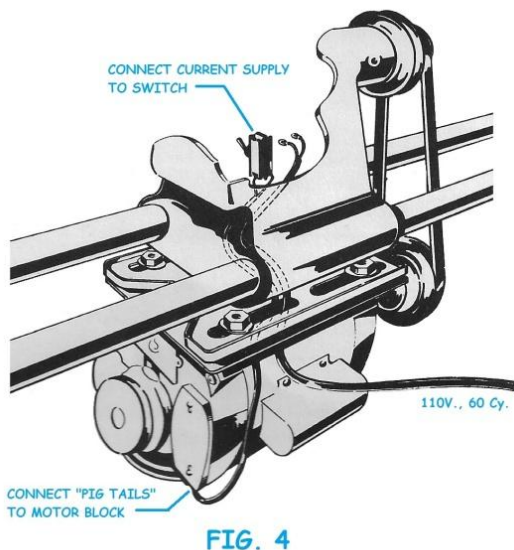




To fit switch to the headstock, after the cord has been connected, remove the threaded lock nut and ON-OFF plate from shank of the switch and insert it through hole in the headstock. Replace ON-OFF plate and run the lock-nut down hand-tight temporarily. Do not tighten the switch in its final position until the OFF position of the toggle lever points toward the tubular ways. Installation of the switch in this way is a safety precaution and prevents accidental contacts from turning on the power. *(i.e.: dropping something that accidentally toggles the switch on)*

MOUNTING MOTOR - Shopsmith is designed to be operated by a 1/2 HP capacitor or repulsion-induction ball-bearing motor having a speed of 1750 rpm. Though some operations may be satisfactorily performed with a lighter motor, full utilization of this versatile tool can only be obtained by having adequate power.

The motor shaft must be ball-bearing mounted to operate in both vertical and horizontal positions, and extreme caution must be taken to prevent sawdust or chips falling into the motor through the vent holes. The special Shop-smith motor has been designed for "ceiling" mounting; that is, the vents are facing down when the motor is installed. When using other motors, invert the end caps or shield the vent holes. Also, note that capacitor box should be side-mounted to eliminate interference with the bench.

Attach motor bracket with four 1/4 by 1-inch machine bolts and washers, but do not tighten bolts until motor has been finally positioned. Hold motor bracket in place by tightening the Allen setscrews.

ADJUSTING PULLEYS AND BELTS - Attach motor pulley, small pulley next to motor, on the motor shaft. Lower Shop-smith to its horizontal position. Be sure setscrews on motor bracket rods are tight and align motor pulley with headstock pulley by adjusting motor until the two are in line. Tighten motor to bracket, but do not apply belt to pulley until motor wires have been connected to lead wire and switch and the motor tested for correct rotation.

Motor should run clockwise when viewed from the motor pulley end (Fig. 2). Rotation of motor can be changed on capacitor-type motors by removing cover from the terminal box and reversing the field-winding terminals to opposite binding posts. In the case of repulsion-induction motors, rotation is reversed by moving the brush holders to one side or the other of a witness mark on the brush holder mounting. If there is any doubt, refer to the wiring diagram of connections supplied with motor or information given on the motor name plate.

With correct rotation of the motor established, apply the V-belt. Length of the belt will vary with the motor used, due to differences in the center distance between shaft and motor bracket. For most installations, a type A belt with an outside circumference of 38 to 39 inches will be needed.

Belt tension can be increased or diminished by adjusting motor bracket on its rods. Belt should be sufficiently tight so that it will not rub against ways at any pulley speed. Avoid excessive belt tension, which will impose a damaging load on bearings, shorten belt life and waste power.

CAUTION: Should spindle bearings heat up, check belt tension immediately.

STORING ACCESSORIES - Shopsmith will perform most efficiently if some provision is made at once for properly storing the interchangeable parts on hooks, shelves, racks or cabinets where they will be convenient to the basic unit. In addition, take the usual precautions against accidental damage and corrosion.

OPERATION

To understand and appreciate what Shopsmith can do, you should be familiar with the principal parts and their uses. Carefully observe the brief descriptions and illustrations that follow:

FRAME ASSEMBLY is the basic structure (Fig. 2). It consists of two center-less-ground steel tubes, base plate, base plate arm, tie bar and headrest. With the exception of the tubes, all parts are high quality cast iron, precisely bored in fixtures that assume their permanent alignment.

The headstock and carriage can be removed from the ways by releasing Allen screws on each side of the tie bar and sliding off the headstock and carriage. The tubular ways have been factory-aligned but, if they should be loosened, re-align them as follows:

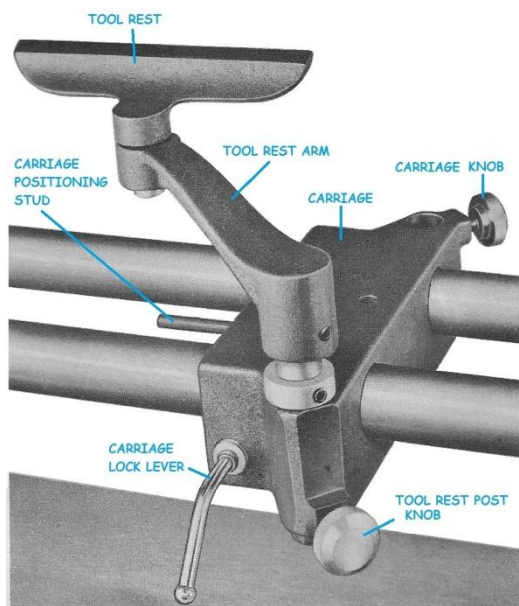


FIG. 5

Raise ways to vertical position and lock with base plate knob. Loosen Allen screws in base plate arm and slide tubes down until they rest on the base plate; lock Allen screws.

CAUTION: Maintain tubular ways with care. Tools and heavy pieces of work falling on or striking tubular ways will raise burrs that prevent headstock and carriage from sliding freely. Any such burrs should be carefully smoothed down. Wipe abrasive dust or metal chips from the ways before sliding carriage or headstock. Always keep ways protected from rusting by a thin film of oil.

HEADSTOCK - Shopsmith headstock (Fig. 3) is the key operating unit and contains the headstock spindle-shaft and bearings, quill, pinion shaft and gear, pulley shaft and bearings. Since the bearings are of the grease-sealed type, it should never be necessary to disassemble the headstock. If, however, adjustment or replacement ever should be required, components can be disassembled as follows:

To remove pulley bearing-assembly, remove belt, loosen Allen screw and pull out total assembly; to remove quill assembly, unscrew nut from depth stop-rod and wind out with feed knob. To remove pinion shaft and gear, take off feed knob, collar and spring and pull out.

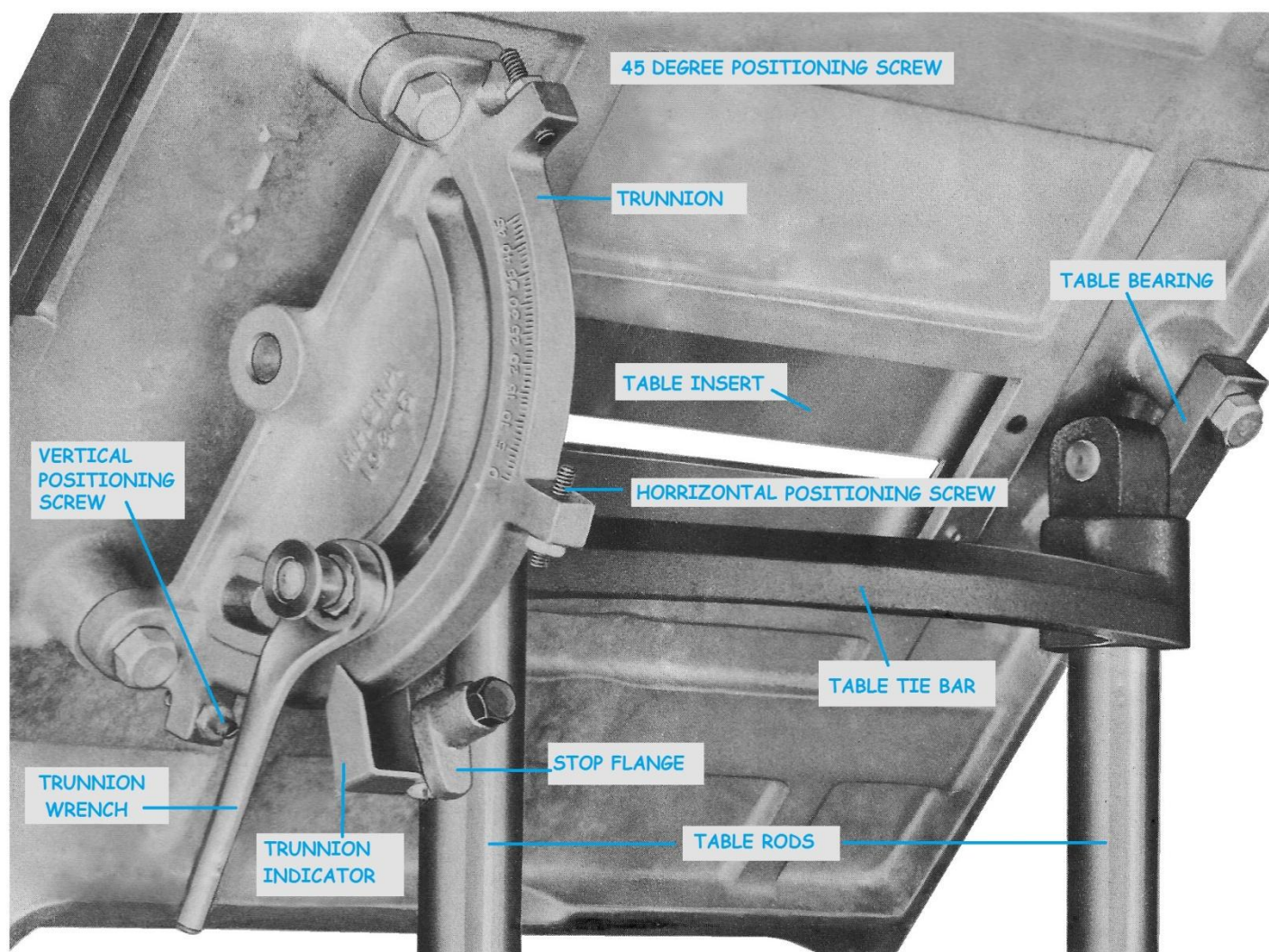


FIG. 6

CAUTION: Ball bearings can be easily injured or ruined by improper handling. When seating or unseating a bearing, apply pressure to the outer race only; when pressing bearing onto or off a shaft, apply pressure on the inner race only. Keep bearings free of grit and do not tap into place with hammer.

The headstock spindle is supported by ball bearings at either end of the quill, which is a movable steel sleeve. When the feed lever is turned, a simple rack-and-pinion gearing moves the quill and the spindle it supports. When pressure on the feed lever is released, a coil spring returns the quill and spindle to their normal, retracted position. This spring is enclosed in a metal case on one side of the headstock. Spring tension is adjusted at the factory; if a different tension is required, adjust by either of two ways:

1. Remove nut from depth stop-rod; turn feed lever until quill rack disengages from pinion gear. Keep turning feed lever until desired tension is obtained. Remember that the external spline on the spindle and internal spline on the pulley shaft must mate; hold the pulley and turn spindle slightly when re-inserting the quill and spindle.
2. Release the Allen set screw in the collar outside the spring housing. Grip the spring housing tightly and pull it slowly away from the headstock until the housing clears the boss on end stock. To increase tension, turn the case counter clockwise. Other possible interference with proper spindle return may be investigated by slacking off all spring tension and working feed lever which, of course, should operate freely in this position.

CARRIAGE - The precision-bored carriage (Fig. 5) is locked at any position on the ways by the carriage lever, which applies wedges against the tubes. Carriage knobs on either side secure the table or lathe tool rest at desired height.

CAUTION: Be sure that both carriage lever and knobs are tightened before starting any operation. The bolt extending from side of the carriage facing the headstock automatically stops the carriage in the correct position in relation to the headstock for using the circular saw.

TABLE - Shopsmith's precision-ground aluminum table (Fig. 6) is supported on the carriage by two steel rods and the adjustment is held by the carriage knobs. The table can be tilted from 45 degrees in one direction to 90 degrees in the opposite direction.

Table trunnion (Fig. 6) permits the table to be tilted and locked at any desired angle. Automatic stops are provided at the 45-degree, horizontal and 90-degree positions.

A removable insert to accommodate dado heads and formed cutters is provided. Insert is leveled flush with surface of the saw table by adjusting Allen screws on under side. Two table slots allow the miter gauge to be used on either side of the saw blade.

The saw guard and splitter (Fig. 7) combine clear views of the work with utmost safety; it can be adjusted to conform to any position of the table by releasing screw on back of table.

CAUTION: Use the saw guard and splitter for all sawing operations.

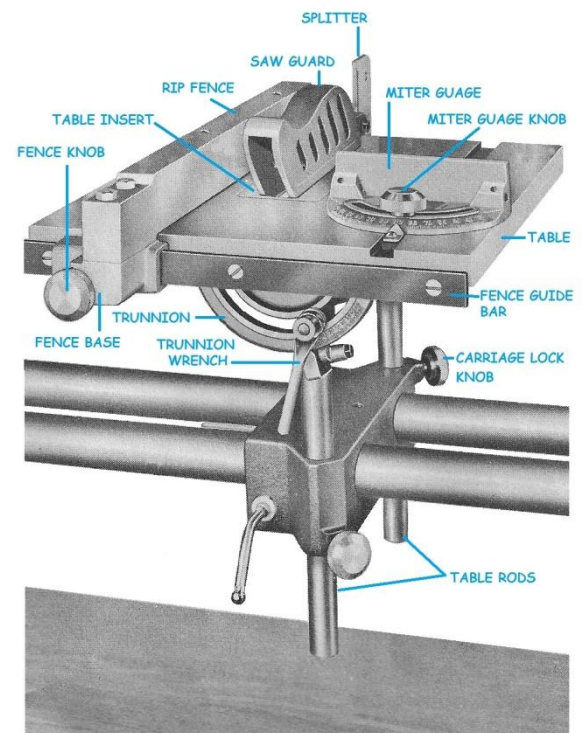


FIG. 7

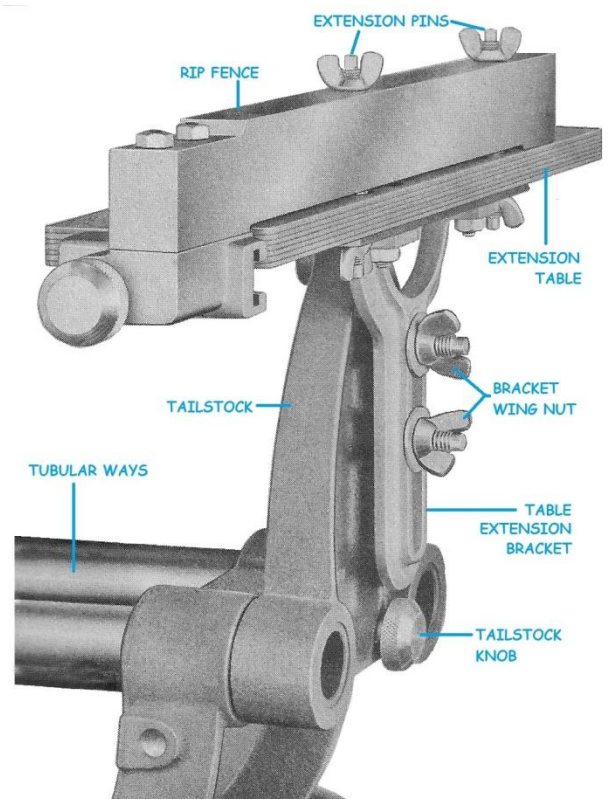


FIG. 8

TABLE EXTENSION -There are two studs with wing nuts attached to the back of the tailstock (Fig. 8) to which the slotted bracket of the table extension is attached. Two vertical studs through the plywood table extension are provided so that the rip fence from the saw table can be used as a guide for the work as it is fed into the saw.

TAILSTOCK - When used as a lathe in spindle-turning operations, the Shopsmith departs from the conventional by using a fixed tailstock (Fig. 8) and a movable headstock. The tailstock is accurately machined to the ways and aligned so that the tailstock or "dead" center will line up accurately with the headstock center. The tailstock is bored to a No. 2 Morse taper so that the center is rigidly held.

PULLEY SPEEDS - Matching three-step cone pulleys on motor shaft and headstock spindle provide the necessary high (3500 rpm), intermediate (1750 rpm) and low (875 rpm) speeds (Fig. 10). This range of speeds provides relatively wide latitude but, while the following operating speeds for various operations are suggested, it will be best to use the lower speed on any questionable job until experience determines use of a higher speed.

WOOD TURNING			
DIAMETER OF WORK	ROUGHING CUT	GENERAL CUTTING	FINISHING
Under 2 in.....	2	2	3
2 to 4 in.....	1	2	3
4 to 6 in.....	1	2	2
6 to 8 in.....	1	1	2
8 to 10 in.....	1	1	1
Over 10 in.....	1	1	1

CIRCULAR SAW		PULLEY POSITION
8-in. Combination Blade.....		3
SANDING AND GRINDING		
12-in. Disc Sander		2
3-in. Drum		2
4-in. Grinding Wheel		3
6-in. Grinding Wheel		3
Buffing and Polishing (cloth wheel).....		3
Scratch Brushing (rough finish).....		1
Scratch Brushing (smooth finish).....		3
DRILL PRESS		
Wood Boring (Bits to ½ in.).....		3
Wood Boring (Bits to 1 in.).....		2
Wood Boring (Bits over 1 in.).....		1
Mortising (Hardwood)		2
Mortising (Soft wood)		3
Routing		3
Shaping		3

WOOD-TURNING LATHE

When used for spindle turning, which describes all work when turned between centers (Fig. 9), square both ends of the work and locate center on each end. If hardwood, drill a small hole at each center point and make shallow diagonal saw cuts across the end to be driven by the spur center.

Do not drive the work onto the center.

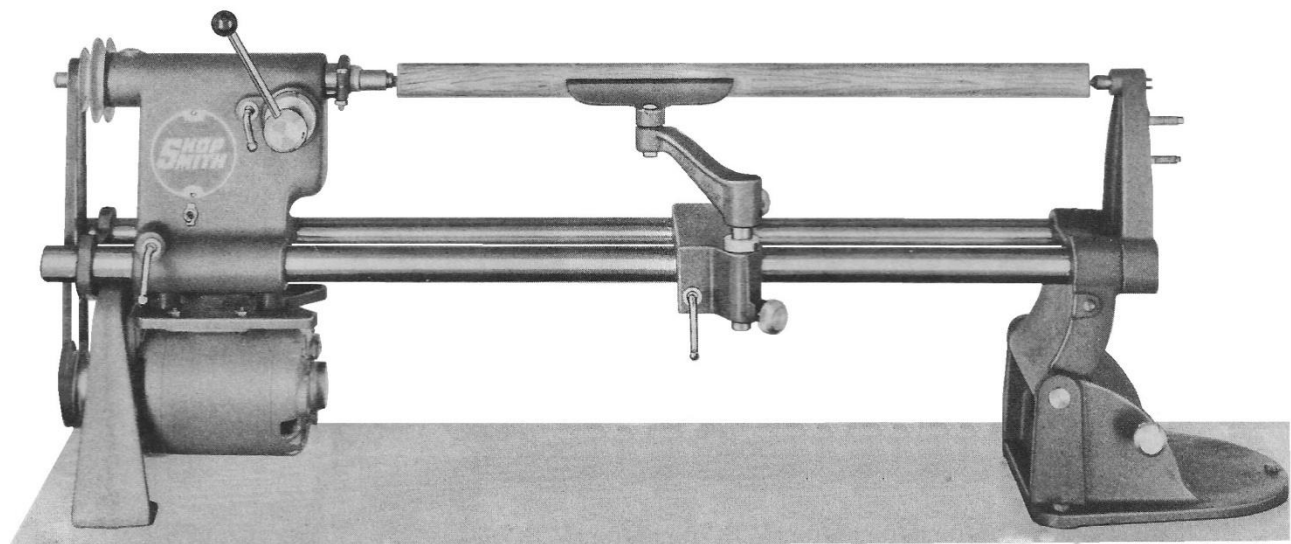


FIG. 9

Remove the spur center from the spindle and drive it into a firm seat in the wood with a mallet. Replace spur center on spindle and tighten setscrew. Be sure tailstock knob is tightly locked.

Position and lock headstock on the ways at a point where it will be approximately 1/4-inch greater than the stock to be turned. Locate the work between centers and advance quill feed lever to seat centers solidly; turn work by hand to see that it does not bind and tighten quill lock lever. Apply a drop or two of oil to the tailstock center before or after centering work.

The tool rest (**Fig. 5**) is seated in carriage hole nearest the operator and adjusted about 1/8 inch above center and so it will clear the work by about the same amount.

CAUTION: Always turn work by hand to see that it clears the tool rest before starting motor.

FACEPLATE TURNING - If the work to be turned cannot be held between lathe centers, it is generally mounted on a faceplate (**Fig. 11**) or chuck. The Shopsmith faceplate is recommended.

The tool rest is easily turned parallel to the work. By removing the tailstock and then moving carriage and head-stock to the extreme right position, the operator can face the work directly.

CIRCULAR SAW - Shopsmith, when used as a saw, is designed for use with an 8-inch saw blade (**Fig. 12**). Smaller blades can be used, but the table will not accommodate larger ones. To attach saw blade, push the arbor onto the spindle as far as it will go and tighten setscrew against flat side on spindle. (**NOTE:** All attachments used on the spindle should be located so that their setscrews, when tightened, will seat against this "flat"; otherwise, the spindle will be burred and attachments cannot be applied or removed freely.)

CAUTION: Because it is not practical to completely guard that portion of the saw underneath the table, the user is cautioned not to make adjustments while the saw is in motion.

Place blade between washers, large washer first, on arbor, with teeth pointing toward the operator, and tighten.

Place saw table rods into carriage holes and lower to the point where they can be locked by the carriage knobs. Locate headstock at desired point on the ways and lock with headstock lever; slide carriage toward headstock until saw blade is directly below slot in table insert. When this location has been established, adjust the stud attached to front of carriage so that it just touches the headstock. Thereafter, or until the blade is changed on the saw arbor, this bolt will serve as an automatic stop for correctly positioning the table in sawing position.

To lower table to desired depth of cut, hold front table rod in the left hand; release back knob and then front one. When grip is relaxed, the table will lower itself slowly and evenly into position; lock carriage knobs.

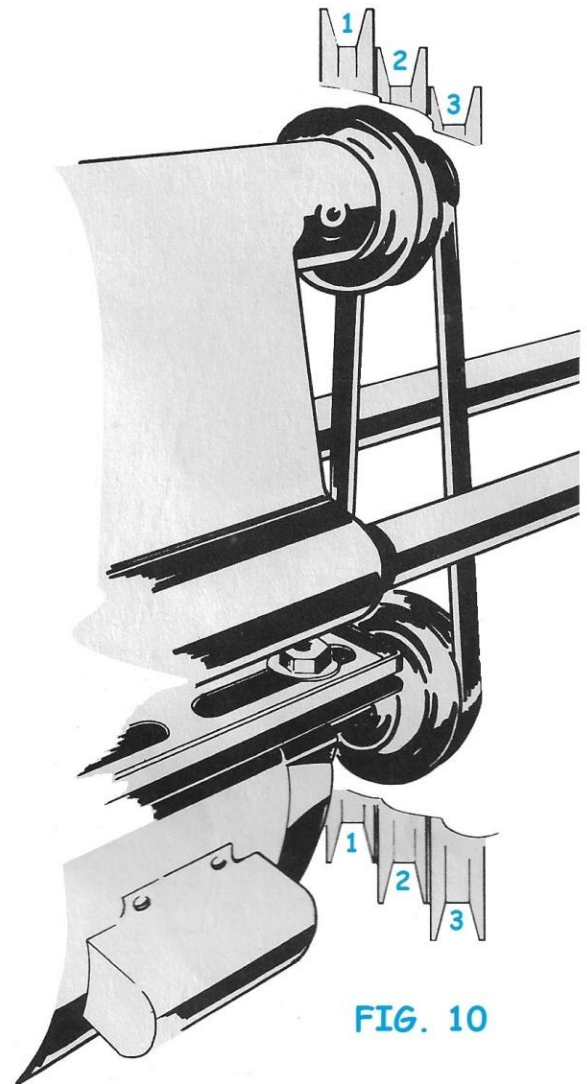


FIG. 10

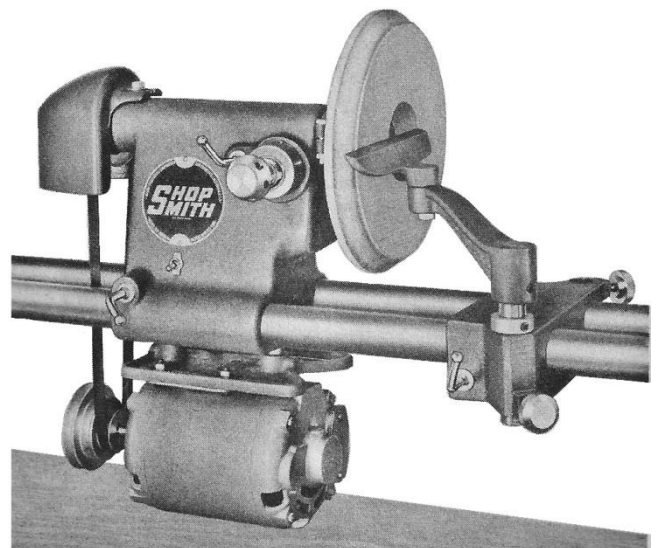


FIG. 11