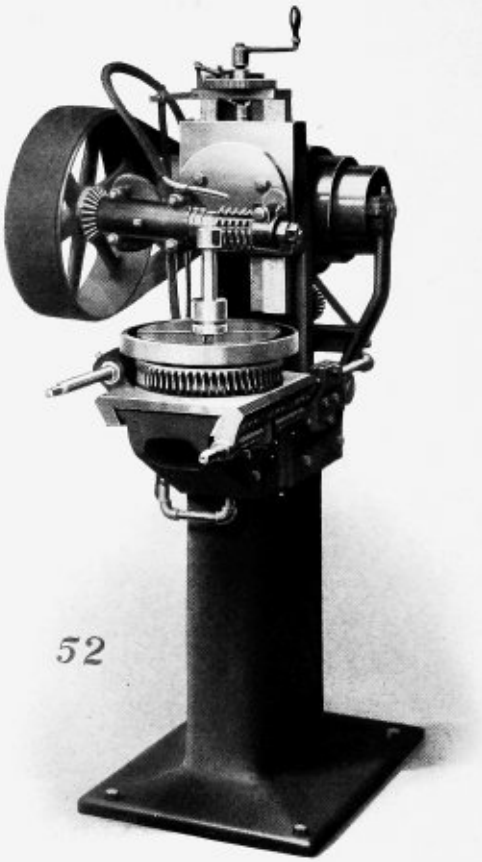
No. 58

# The Farwell Automatic Gear Hobbing Machine

The Adams Company

Dubuque, Iowa, U. S. A.




THE FARWELL AUTOMATIC
GEAR HOBBING MACHINE

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THE system of cutting spur gears by the use of a hob has proved to possess so many advantages over the old method of milling one tooth at a time that the Gear Hobbing Machine is certainly destined to entirely displace the ordinary automatic gear cutter. The rapidity of the work is far ahead of any system of milling or planing gears. It is a continuous cut from start to finish up to the full capacity or strength of the hob teeth.

The accuracy of this work and the smooth quiet running of the gears produced on the Gear Hobbing Machine can be approached only, but not equalled, by the generated gear of the gear planer. The Gear Hobbing Machine generates the teeth theoretically correct and all the teeth are exactly the same thickness and form.

We claim that the Farwell Automatic Gear Hobbing Machine is one that will cut accurately and economically a large per cent of the gears used in manufacturing, and will cost but a fraction of that of other machines of the same capacity.

This machine is intended to be used more as a manufacturing gear cutter than as a jobbing shop tool, therefore, we do not add to the cost by furnishing a full set of change gears, etc. or power feed and automatic trip for worm wheel cutting, which would in all probability never be used. Of course by equipping it with a full set of change gears and a full set of hobs it is complete for all sizes and pitches of gears up to its capacity of 12 inches diameter and 6 inches face. This capacity, we believe, will cover nearly all of the requirements for automobile transmission gears, lathe, boring mill, milling machine and other machine tool change gears, drill press and other back gears.

It requires one hob for each pitch desired. One hob of the desired pitch will cut gears with any number of teeth up to the full swing of the machine table (12 inches). The same hob will also cut worm gear wheels. Only one hob for each pitch desired. We furnish with the machine one set of change gears for a specified number of teeth. We will furnish extra change gears for the machine, at an additional price, to cut any number of teeth stipulated by the purchaser. This has nothing to do with the pitch. Hobs we do not furnish. They can be obtained of carbon steel or high speed steel at an additional cost of about 40 per cent above carbon steel prices.

We furnish at an extra charge a power feed and automatic trip for cutting worm gears which is economical when many worm wheels are to be cut.

The regular machine will cut worm gears but the table would be fed by hand crank to a depth stop. This is just as quick but would require constant attention of the operator.

The spindle is driven by a 4 inch belt on a 15 inch diameter pulley from a swinging cone pulley shaft and the drive belt is kept taut in all positions of the spindle head by a distance rod provided with turn buckle for adjusting. Three spindle speeds are obtained by the three step cone pulleys for 2½ inch belt on the swinging shaft and countershaft.

The countershaft is provided regularly with one 4 inch by 10 inch friction clutch pulley. Two pulleys may be provided where more spindle speeds are desirable, but as the hobs do not vary greatly in diameter three spindle speeds are deemed sufficient to take care of the requirements.

The spindle head is swivelled upon the saddle so that the hob may be set at the proper angle for cutting spur gears with different pitches or for cutting worm gears. This saddle is gibbed to the slide on the column for providing vertical feed.

The hobs for cutting spur gears are regularly right hand, single thread, 3 inches diameter, 3 inches long with 1¼ inches arbor hole and ¼ inch keyway. Other sizes, of course, may be used. The hob may be moved lengthwise so the entire length of hob can be used before requiring sharpening.

The table revolves upon a wide angular surface that gives the table great rigidity. A small plunger pump forces a stream of lubricant upon the cutter and work when desired. The knee that supports the table saddle is hollow and forms a tank or reservoir for the lubricant. Holes through the table hub conduct the lubricant back to this reservoir.

The table is revolved at the proper speed (varying according to number of teeth in gears to be cut) by means of one pair of bevel gears at the spindle head, one worm gear at the table and one pair of spur gears connected to bevel gear by shaft with universal joints.

There being a small number of joints and all gears and shafts being large, insures a very steady positive drive of the table in unison with the cutter, which is very essential for accurate work. Usually one only of the spur gears is changed when the number of teeth to be cut is changed.

The vertical feed is by means of a pawl and ratchet operated through a reducing gear by an eccentric on the worm shaft. The feed may be changed without stopping the machine by shifting the button on the bell crank at the top of the machine. A trip automatically stops this feed when the hob has finished the gear.

No attention is required by the operator other than putting on blanks and taking off finished gears. One operator may run several machines or attend this gear cutter while operating other tools.

A rigid stop is provided, against which the table saddle may be run, to give the proper depth of the teeth. Instead of setting this stop by micrometer graduations which require much care in setting, a hardened steel gauge is provided which is of a thickness equal to the depth of the teeth of the pitch desired. To set the stop, the table is advanced until the blank contacts the hob. The stop is then screwed up against the gauge block. When the gauge block is removed and the table is advanced to stop, the correct depth is obtained. After the stop is set for a given diameter, any number of gears of same size are cut the proper depth by simply moving table to this rigid stop. A careless operator cannot spoil work as is often done when depth is set by micrometer gauge.

## DIMENSIONS

**The Spindle** is 1¾ inches in diameter and has a bearing 6¾ inches in length. Provision is made for taking up wear and end play. The spindle is driven by 15 inch pulley for 4 inch belt. The arbor has an outward bearing 1¾ inches long and 1⅝ inches diameter. These supports for the spindle are very rigid and overhang only enough to swing a 3 inch hob.

**The Saddle Bearing** is 8½ inches long upon the housing and is very heavily gibbed thereon.

**The Swivel Head** is 8½ inches in diameter and is secured to the saddle by three T head bolts. The head is counterbalanced by weights in the column.

**The Table is Supported** and revolves on a cone surface 9½ inches in diameter at outer edge and is 2½ inches wide. In addition to this there is a center hub bearing 3½ inches in diameter extending through the saddle with adjusting ring nut below.

**The Table Saddle** is 12½ inches long and is heavily gibbed to the knee which is 8 inches wide.

**The Feed Screws** for the head and for the table are both ⅞ inch diameter with square thread. The top screw is ¾ inch diameter, and has hardened steel contact points in screw end and in saddle.

**Countershaft** furnished has 10 inch pressed steel hangers 1 7-16 inch shaft, 4 x 10 inch clutch pulley and three step cone pulley for 2½ inch belt.

Countershaft should run 130 R. P. M.