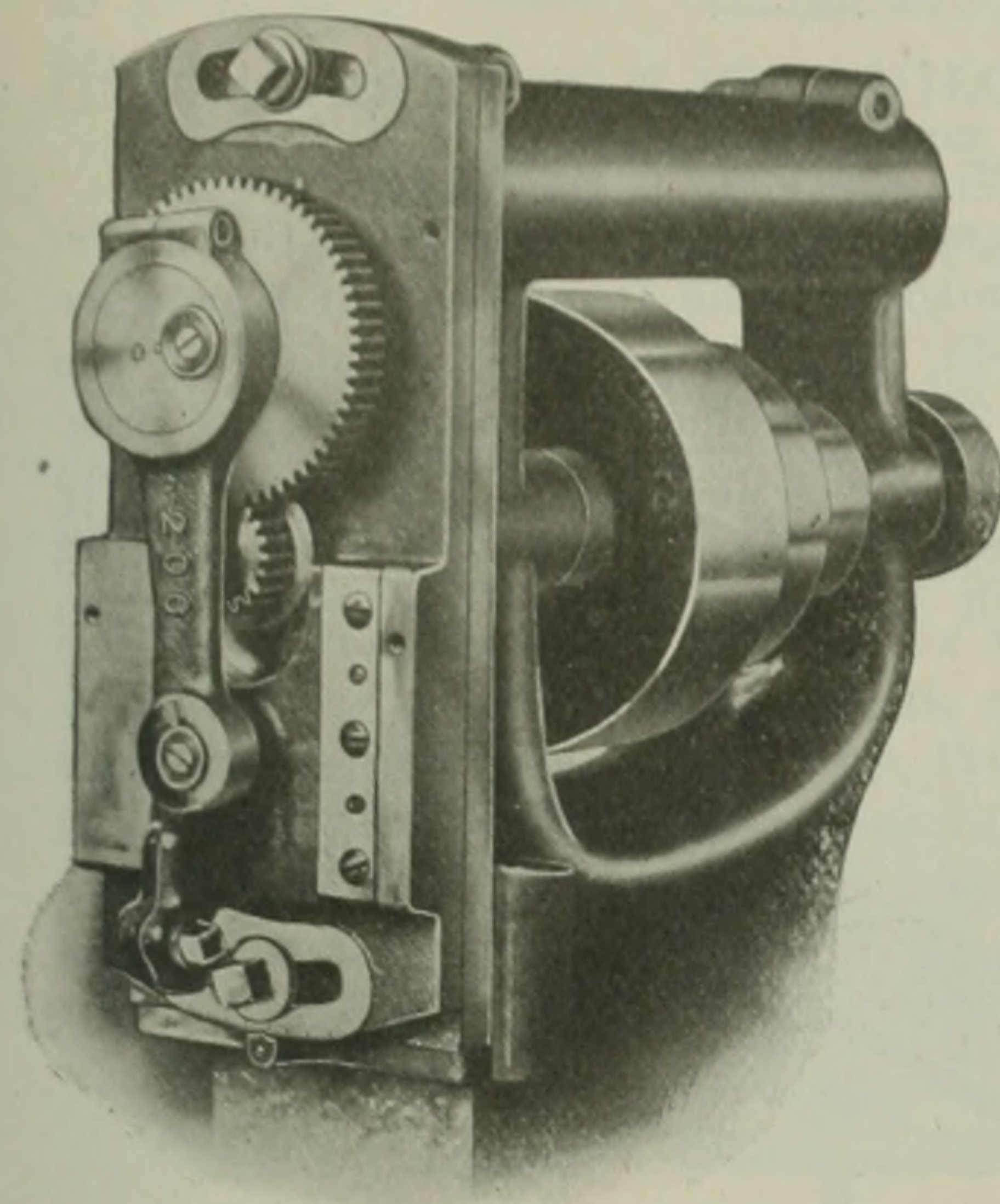


illustrate the power of the tool, it is said that the 4-inch stroke riveting hammer, weighing 11 pounds, will drive $\frac{3}{4}$ -inch rivets steam tight.

SLOTING ATTACHMENT FOR THE BURKE MILLING MACHINE.

The accompanying illustration shows a back-geared slotting attachment designed by the Burke Machinery Co., 1837 Thirty-fifth St., Cleveland, O., for use with its No. 3 and 4 milling machines. One of the novelties in the construction of this attachment is the geared drive, which makes heavy cuts possible on a high speed miller.



Back-geared Slotting Attachment with Gear Case removed.

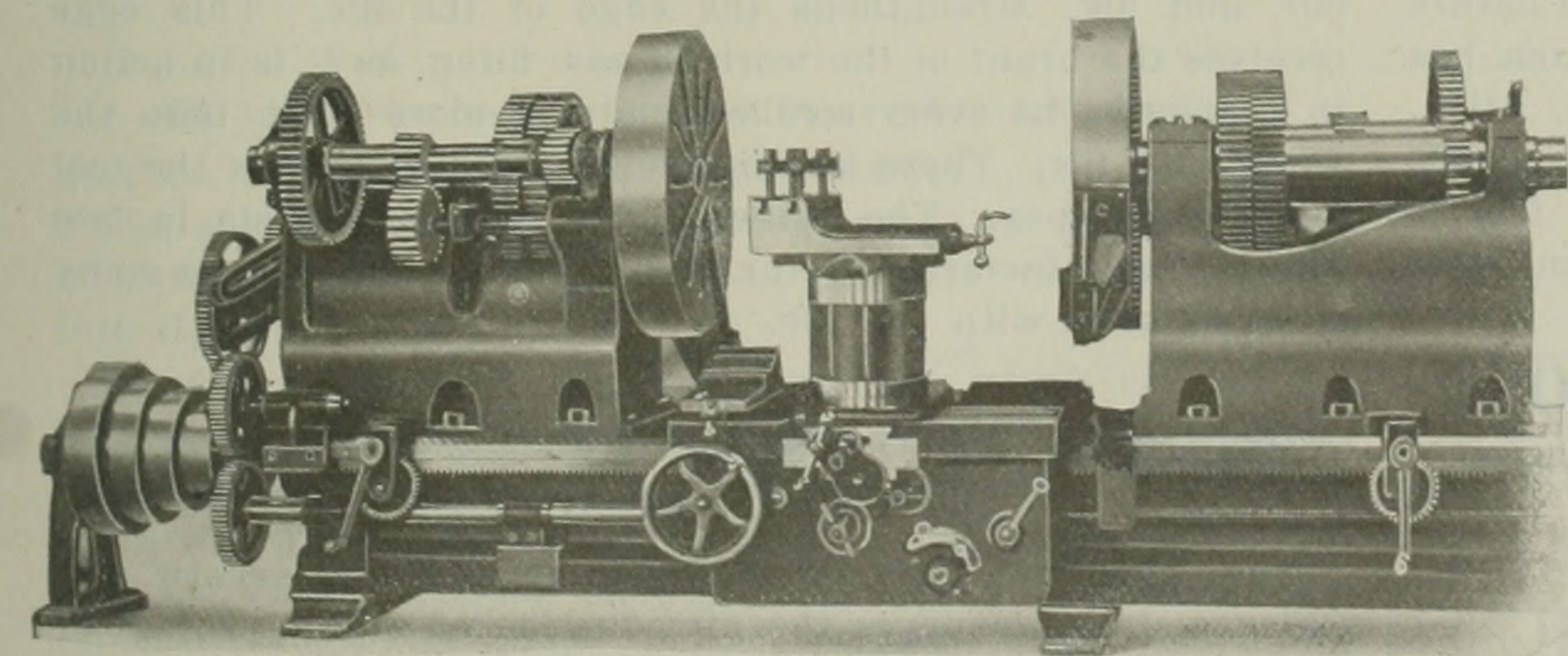
The attachment is clamped to the face of the column, and to the over-hanging arm support, making it, for all practical purposes, a part of the machine. The guides for the slide swivel on this support about the axis of the driving pinion, to any angle up to 10 degrees either side of the center.

The graduated dial for reading this adjustment, and the bolt for clamping the slide to the desired angular position, are clearly shown in the engraving. The stroke is one inch. The device weighs, complete, twenty-three pounds.

FAY & SCOTT DOUBLE-HEAD FACING LATHE.

The 62-inch double-head lathe shown herewith is a combination of facing machine and lathe. It is particularly designed for use in facing flanges, girders and similar work held in stationary fixtures on the bed. For this purpose it is provided with facing slides and tool-holders on the faceplates. It is also adapted to the boring of cylinders by means of a traveling head boring bar. The machine was constructed from the stock parts of the builders' regular 38-inch standard lathe, raised to swing to 62 inches over the bed, and 50 inches over the carriage.

The machine is fitted with a regular carriage, having an extension for the extra swing; it is provided with the usual



A Modified Lathe, adapted to Facing and Boring Work mounted on the Bed or Carriage.

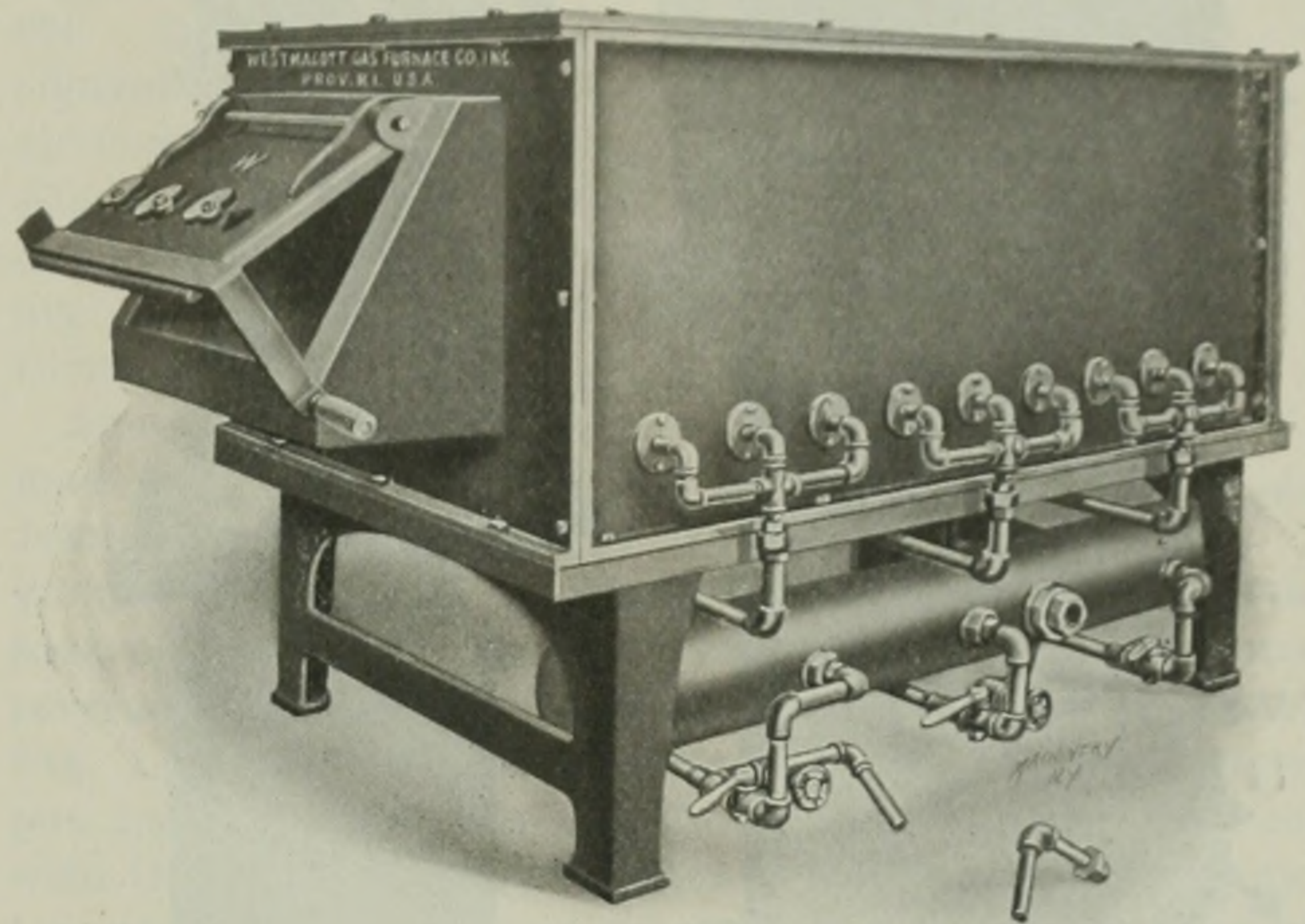
feeds and screw cutting features, making the machine available for ordinary lathe work. The head-stocks are each adjustable lengthwise of the bed by a rack and pinion movement; they may be clamped in any position to suit the work in hand. The facing heads, which also form the faceplates of the lathe, are driven by the usual triple-gear mechanism, being provided with internal gear teeth in their rims engaging driving pinions in the head-stock. Each head-stock is driven from a spline shaft passing through the center of the bed. The spindles run in opposite directions to equalize the strain on the work.

The back gear ratio is $12\frac{1}{2}$ to 1; the gear ratio with the triple drive into the faceplate is 40 to 1. The maximum distance between the facing heads with a 22-inch b d is 13 feet. The weight is 24,000 pounds. The builders are Fay & Scott, Dexter, Me.

WESTMACOTT HARDENING AND ANNEALING FURNACE.

The accompanying engraving shows a hardening and annealing furnace recently furnished by the Westmacott Gas Furnace Co., Inc., of Providence, R. I., to the Rock Island Arsenal. It is notable for the small gas consumption due to a new style of burner with which it is equipped.

The furnace is intended for annealing and hardening carbon steel, the maximum temperature required being 1,600 F. The space to be heated is 62 inches long and 26 inches wide. Nine burners on each side are provided, or eighteen in all. These are divided into three sets of six each, controlled inde-



A Hardening and Annealing Furnace, which shows great Fuel Economy.

pendently, as shown in the engraving. The furnace operates satisfactorily on about 425 cubic feet of gas per hour; the fuel in this case has a richness of about 425 B. T. U. per cubic foot, and the air pressure is $1\frac{1}{2}$ pound per square inch. The net weight of the furnace is 6,500 pounds.

CUTLER-HAMMER ALTERNATING CURRENT DRUM CONTROLLERS.

The Cutler-Hammer Mfg. Co., of Milwaukee, Wis., has recently developed a line of drum controllers for use with two- or three-phase slip ring motors, operating cranes, hoists, and other classes of machinery which require frequent starting or stopping. Both the drum and resistance are rated for intermittent duty not exceeding 150 per cent of the motor rating, for both primary and secondary circuits; and they are designed to reduce the motor speed 50 per cent under average load conditions. Where the service is exceptionally severe, or where special specifications are to be met for which the standard controller may not be suitable, the builders are prepared to give estimates on special equipment.

The drums consist of a three-pole primary, combined line and reverse switch, with a cylinder for controlling the secondary starting and regulating resistance, mounted on the controller shaft and driven directly by the operating lever. For all sizes of drums the secondary resistance controller is of open construction. For the types A, B and C drums the primary switch is also of open construction, but for the types D and G drums the primary switch is immersed in oil. The A, B and C drums are arranged for wall mounting, but the D and G drums are for floor mounting, in order to provide properly for the oil tank containing the primary switch. The installation of the latter should provide space for the removal of the oil tank for connecting and inspection. The drums are constructed of the best materials throughout. All contacts