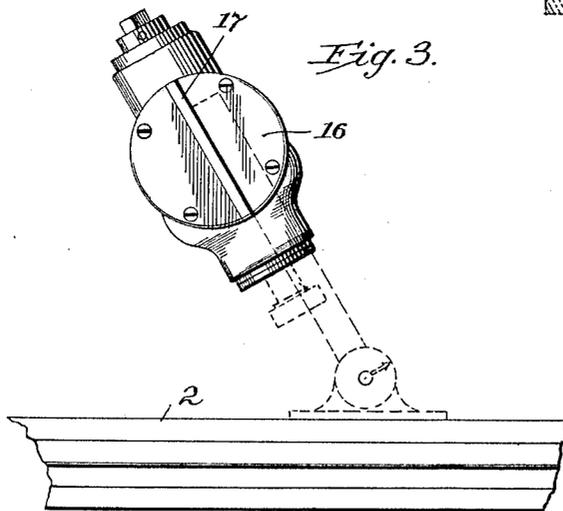
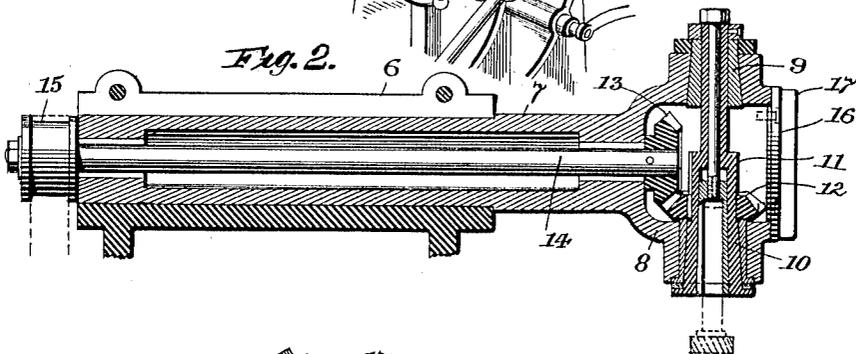
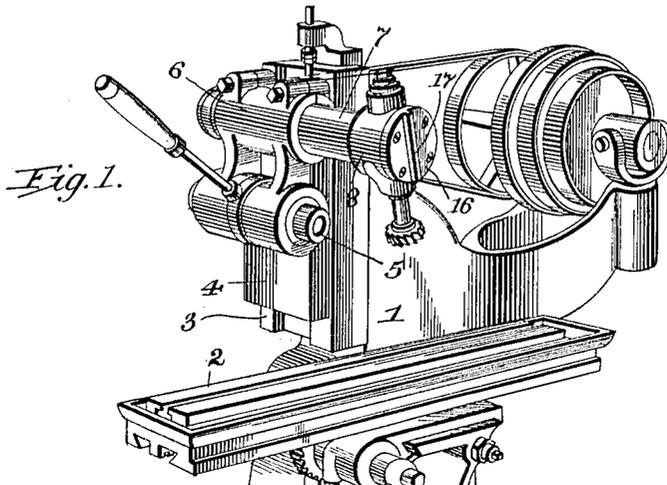


G. G. PORTER & F. E. CABLE.  
 HIGH SPEED ATTACHMENT FOR MILLING MACHINES.  
 APPLICATION FILED MAY 22, 1908.

1,012,430.

Patented Dec. 19, 1911.



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# UNITED STATES PATENT OFFICE.

GEORGE G. PORTER AND FRANK E. CABLE, OF SYRACUSE, NEW YORK.

HIGH-SPEED ATTACHMENT FOR MILLING-MACHINES.

1,012,430.

Specification of Letters Patent. Patented Dec. 19, 1911.

Application filed May 22, 1908. Serial No. 434,388.

*To all whom it may concern:*

Be it known that we, GEORGE G. PORTER and FRANK E. CABLE, citizens of the United States, residing at Syracuse, in the county of Onondaga and State of New York, have invented certain new and useful Improvements in High-Speed Attachments for Milling-Machines, of which the following is a specification.

Our present invention pertains to improvements in milling machines, and has reference more particularly to a high-speed attachment adapted to be applied to an ordinary commercial miller.

The invention will be best understood upon reference to the accompanying drawings, wherein:

Figure 1 is a perspective view of the upper portion of a milling machine, showing our invention applied thereto; Fig. 2 is a longitudinal sectional view of the supporting arm for the tool-holder and the driving mechanism; and Fig. 3 a front elevation of the attachment and a portion of the bed or table, illustrating the manner in which the tool may be brought to any desired adjustment by means of a protractor or square.

The object of the invention is to provide a device which may be readily substituted for the overhanging arm which is employed as a support for the out-board bearing for the spindle on which the usual milling cutters are mounted.

The construction is such that the support for the high-speed cutter may be readily substituted for the support or arm which furnishes the out-board bearing, and adjusted to any desired position with relation to the bed of the machine.

By substituting larger pulleys for smaller ones upon the driving shaft of the attachment a change of speed may be effected, and heavier cuts may be made by using a large pulley. This change of speed may be accomplished by employing the pulleys which are generally furnished with machines of this character.

Referring to the drawings, 1 denotes the main frame of the milling machine, and 2 a movable bed or table which may be actuated by hand or otherwise, as is usual in this class of machines. Mounted above the table, and moving upon vertically-disposed ways 3, is a slide 4, which is provided with a bearing for the power-driven shaft or spindle 5, on the outer end of which the

arbor or chuck that carries the ordinary cutter is mounted. The upper portion of the slide is formed with a split box or bearing 6, which in usual practice carries a rod which is attached the bracket that forms the out-board support for the outer end of the arbor upon which the milling cutter is mounted. This is the construction commonly employed in commercial machines, and particularly that known as the "Whitney hand miller".

When the machine is to be used for die-sinking, profiling, cutting small key-ways and oil-ducts and all kinds of light vertical milling, it is desirable to employ a tool driven at a high speed, and to this end we propose to furnish an attachment which can be substituted for the shaft or bar above referred to, and is usually mounted in the split bearing 6 and may be brought to any desired adjustment with reference to the table. The attachment comprises a hollow sleeve or arm 7, of such diameter as to make a neat fit in the split box 6, in which it may be clamped when it has been brought to the desired position. The sleeve at its outer end is provided with a hollow head 8, formed with diametrically opposite openings, in which are mounted bushings or bearings 9, 10. These bearings form the support for a rotatable spindle or tool-carrier 11, which may be of any preferred form. A bevel-gear 12 is secured to the spindle and meshes with a similar gear 13, secured upon a shaft 14 extending longitudinally through the sleeve 7 and carrying at its opposite end a pulley 15, the pulley being removable, so that pulleys of variable sizes may be employed according to the requirements of the special tool employed or the work being done. A cap-plate 16 is secured to the outer face of the head 8, and a rib 17 is formed upon said plate and stands in true axial alinement with the spindle and the tool carried thereby.

By the employment of a protractor, as shown in dotted lines in Fig. 3, the head 8 may be brought to any desired position with reference to the table and there secured by tightening up the bolts of the split box 6. The use of a protractor avoids the necessity of placing fine graduations or marks upon the machine, and enables the operator quickly and accurately to adjust the head.

The arrangement set forth permits the vertically-disposed spindle of the tool to be

adjusted to any angle required. It will likewise be noted that the tool-spindle may be so set as to stand at right angles or perpendicular to the table, which position may be readily attained by using a square brought against the rib 17, the other member of the square resting upon the table. The arrangement also enables the table to be brought up to a higher level than would be possible with a vertical attachment driven by the usual spindle.

It will be noted that with the present device the cutter assumes a position just about on a level with the tool which is mounted on the ordinary horizontal spindle. This feature makes the performance of the work very much more convenient. This construction permits the tool to be run at a very high rate of speed, and end mills of small diameter may be employed. At the same time, the device is very sensitively driven, so that the power used does not exceed the strength limit of the cutter being employed.

Having thus described our invention, what we claim is:

1. In a milling machine, the combination of a fixed frame; a bed; a slide mounted on the frame above the bed and movable toward and from the same; a bearing carried by the slide; a supporting member mounted and held in a fixed adjusted position in the bearing; a tool-holder carried at the outer end of said supporting member, the tool-holder standing in a plane at approximately right angles to the face of the table; and means for rotating said tool-holder.

2. In a milling machine, the combination of a fixed frame; a bed; means for traversing the same; a slide mounted on the frame above the bed and movable toward and from the same; a box or bearing carried by the slide; a supporting member mounted in said box; means for securing said member in its axially-adjusted position; a driving shaft extending through said supporting member; a pulley carried at the outer end of the shaft; a tool-holder mounted in the opposite end of the supporting member; and gearing interposed between said tool-holder and the shaft.

3. In a milling machine, the combination of a fixed frame; a bed; a slide mounted on the frame above the bed and movable toward and from the same; a split bearing carried by the slide; a supporting member mounted in the slide; means for clamping the bearing upon the supporting member when it has been brought to the desired adjusted position; a shaft mounted in the supporting member; a pulley secured to one end of said shaft; a tool-holder mounted in the outer end of the supporting member; and gearing

interposed between said tool-holder and the shaft, whereby motion may be imparted to the tool-holder when the shaft is rotated.

4. In a milling machine, the combination of a fixed frame; a bed; a slide mounted upon the frame above the bed and movable toward and from the same; a supporting member carried by the slide, the axis of said member lying in a plane substantially parallel with the bed; means for securing said supporting member in its axially adjusted position; a tool-holder carried by the supporting member; means for rotating said tool-holder; and a rib formed upon the supporting member, whereby by the use of a protractor or like instrument the relation of the tool-holder to the bed may be readily determined.

5. In a milling machine, the combination of a fixed frame; a bed; a slide movable upon the frame toward and from the bed; a supporting member carried by the slide, the axis of said member lying in a plane approximately parallel to the bed; a tool-holder standing in a plane at right angles to the axis of the supporting member; means for securing the supporting member in its desired axial position; means for rotating the tool-holder; and a rib formed upon the outer face of the supporting member, said rib lying in a plane approximately at right angles to the longitudinal axis of the supporting member.

6. In a milling machine, the combination of a fixed frame; a bed; a slide mounted upon the frame and movable toward and from said bed; a bearing carried by the slide; a supporting member mounted in the slide, the axis of said member lying in a plane substantially parallel with that of the bed; means for securing the supporting member in its desired axial adjustment in said bearing; a shaft carried by said supporting member; means for rotating the shaft; a tool-holder, the axis of which stands in a plane approximately at right angles to the axis of the supporting member; gearing interposed between said tool-holder and the shaft; and a rib formed upon the outer face of the supporting member, said rib standing in a plane approximately at right angles to the longitudinal axis of the supporting member.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

GEORGE G. PORTER.  
FRANK E. CABLE.

Witnesses:

GILES B. EVERSON,  
D. ALFRED EDDY.