G. L. BOWER.

CAM CUTTING ATTACHMENT.

APPLICATION FILED JUNE 21, 1918.

1,351,365.

Patented Aug. 31, 1920.

2 SHEETS—SHEET 1.

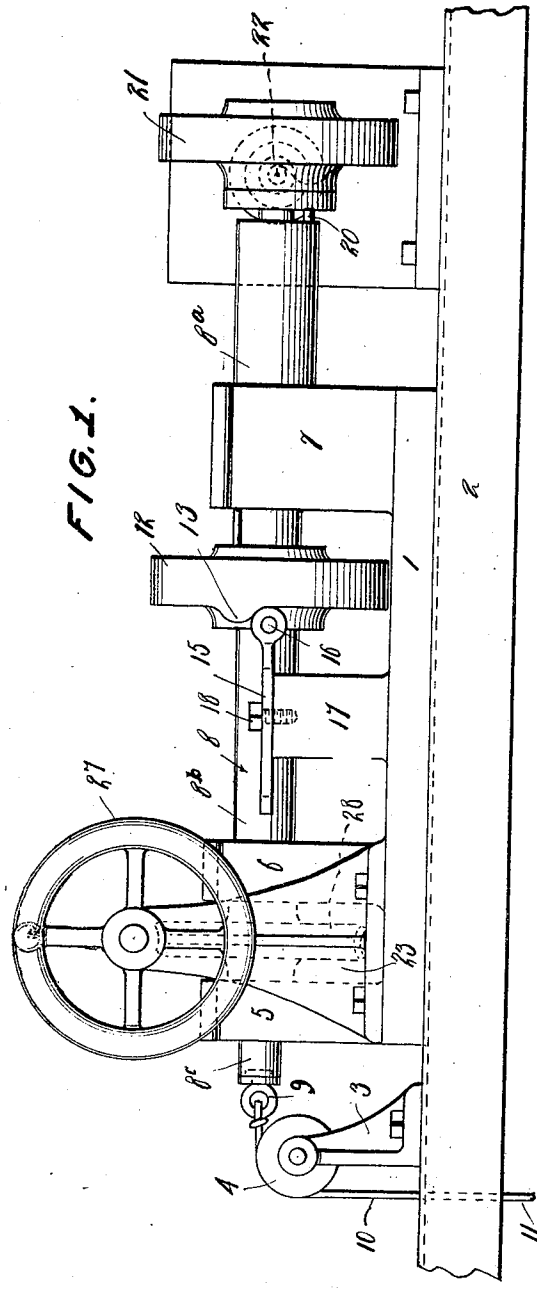


FIG. 1.

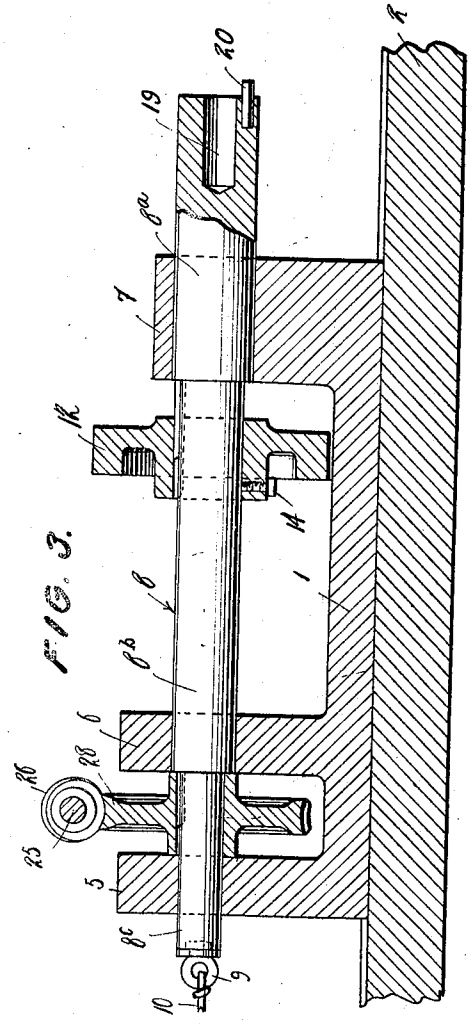


FIG. 2.

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WITNESSES

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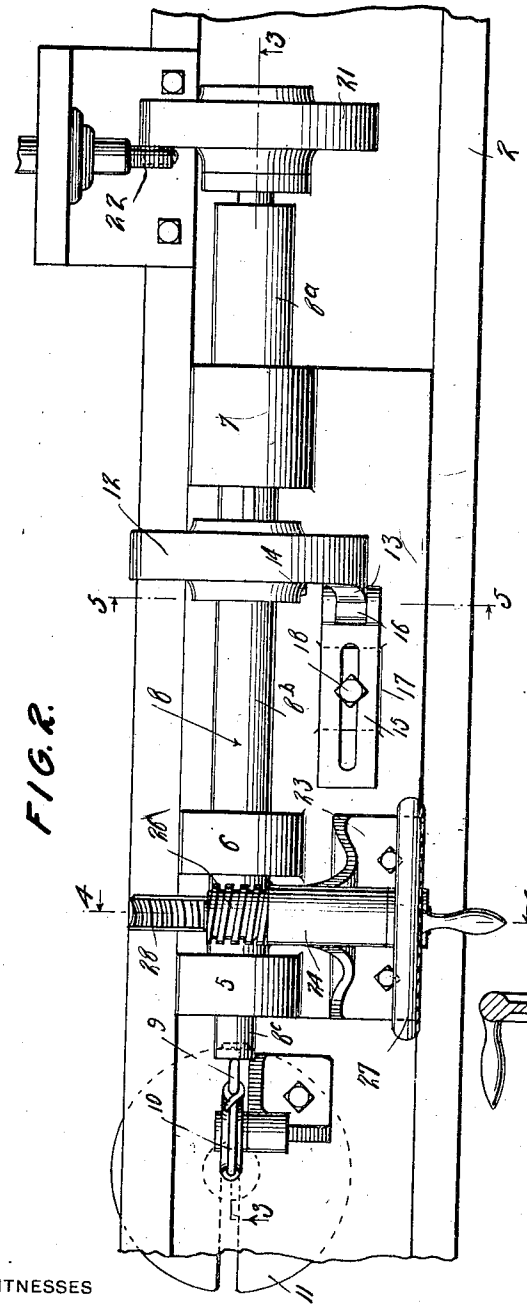


FIG. 2.

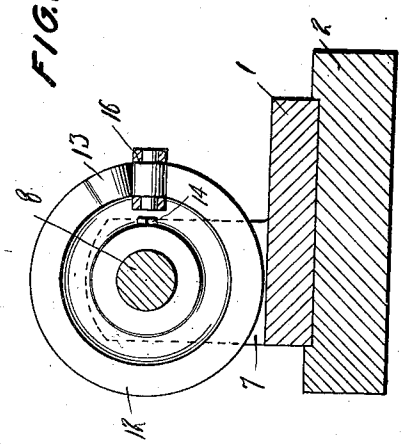


FIG. 5.

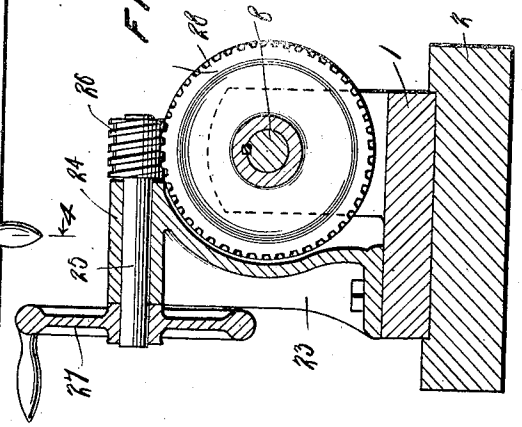


FIG. 4.

WITNESSES

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UNITED STATES PATENT OFFICE.

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CAM-CUTTING ATTACHMENT.

1,351,365. Specification of Letters Patent. Patented Aug. 31, 1920.

Application filed June 21, 1918. Serial No. 241,174.

To all whom it may concern:

Be it known that I, GEORGE L. BOWER, a citizen of the United States, residing at Greenwood, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Cam-Cutting Attachments, of which the following is a specification.

This invention relates to machine elements, and more particularly to cam cutting attachments.

The object of the invention is to provide a simple and efficient attachment of this character capable of use on any milling machine, lathe or drill press,

Another object is to provide an attachment of this character in which the master cam is held yieldably in engagement with the stop for controlling the movement of the work carrying member to provide for the shaping of the work in conformity with the master cam.

With the foregoing and other objects in view, which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein disclosed may be made within the scope of what is claimed without departing from the spirit of the invention.

In the accompanying drawings:—

Figure 1 represents a side elevation of the attachment constituting this invention, parts being broken off,

Fig. 2 is a plan view thereof.

Fig. 3 is a vertical section taken on the line 3—3 of Fig. 2,

Fig. 4 is a transverse vertical section taken on the line 4—4 of Fig. 2, and

Fig. 5 is a similar view taken on the line 5—5 of Fig. 2.

In the embodiment illustrated, the attachment constituting this invention comprises a base 1 preferably of cast iron mounted on what may be termed a sub-base or suitable support 2, which has rising therefrom a bracket 3 carrying at its upper end a grooved pulley 4 for a purpose hereinafter to be described.

Rising from the base 1 are a plurality of uprights, three being here shown, and numbered 5, 6 and 7. These uprights have bearings to receive and support a shaft 8, which is of varying diameters throughout its length, the larger end 8^a being mounted to revolve in the upright 7, the next larger member 8^b in the upright 6, and the smallest end 8^c in upright 5 as is shown clearly in Fig. 3. An eye 9 is carried by the end 8^c of the shaft and has a flexible element 10 connected therewith and extended over and guided by the pulley 4 with a weight 11 secured to its lower end below the supporting base 2. This weight 11 exerts its tension to move the shaft 8 longitudinally forward for a purpose presently to be described.

Splined to the shaft 8 between the uprights 6 and 7 is a master cam 12 having on one face thereof a cam 13, although obviously this face may be varied to suit conditions according to the cam to be cut. This cam 12 is adjustably fixed to the shaft 8 by a set screw 14, and is forced against a stop 15 having a roller 16 at its free end for contact with the cam and which is mounted on a standard 17 rising from the base 1 parallel with shaft 8 and to one side thereof as is shown clearly in Fig. 2. This stop 15 is in the form of a longitudinally slotted plate with a set screw 18 extending through the slot thereof and entering the standard 17 as is shown clearly in Fig. 2, which provides for the adjustment of the stop, to vary it in relation to the master cam 12.

The larger rear end 8^a of the shaft 8 has a socket 19 extending longitudinally inward to receive the arbor of the work to be operated on, which is here shown in the form of a cam 21. A pin 20 extends longitudinally rearward from the end of the shaft 8 and is designed to enter an aperture in the cam 21 to be cut, so as to insure the proper positioning of the cam at all times, it being understood that the cam is first roughed out, removed and finished, and it is necessary that it be placed in the same relation to the shaft 8 when replaced.

The cutter or work shaper indicated at 22 is shown arranged at one side of the attachment in Fig. 2 and is positioned to engage the side of the cam 21 to be shaped, it being understood that this cutter 22 may be changed to meet the circumstances required by it.

Rising from the base 1 near the front end thereof at one side of the shaft 8 is a bracket 23 which has a bearing 24 at its upper end in which is mounted a worm shaft 25 having a worm 26 on its inner end positioned to mesh with a worm gear 28 splined to the

shaft 8 between the uprights 5 and 6. A hand wheel 27 is fixed to the worm shaft 25 and is adapted for rotating said shaft to actuate gear 28 and through said gear to impart rotary motion to the shaft 8.

In the use of this attachment, the work 21 having been placed in the socket 19 of the shaft, 8, the weight 11 operates to draw the shaft forward, thereby bringing the master cam 12 into contact with the roller 16 on the stop 15, the cam projection 13 of the cam 12 lying in the path of said roller, so that after the operator grasps the hand wheel 27 and imparts rotary motion to shaft 8 through the worm shaft 25 and gear 28, the cam 12 will turn with shaft 8 and when the projection 13 thereon engages roller 16, the shaft 8 will move rearwardly against the tension of weight 11 and thus cause the cutter 22 to pass over the portion of the work 21 in a correspondingly curved path so that when completed the cam 21 will correspond to the master cam 12 which constitutes the pattern for forming the cam 21. It is of course to be understood that the shape of the work 21 may be varied by varying the master cam.

While this attachment is simple and strong in construction it is very efficient in operation and may be readily manufactured for use in connection with any milling machine, drilling press, or lathe.

The foregoing description and the drawings have reference to what may be considered the preferred or approved form of my invention. It is to be understood that I may make such changes in construction and arrangement and combination of parts, materials, dimensions, etc., as may prove expedient and fall within the scope of the claimed invention.

Having thus fully described my invention, what I claim as new and desire to secure by Letters Patent, is:—

In an attachment of the class described the combination with a support, of a base mounted on said support and having a plurality of longitudinally spaced uprights rising therefrom, said uprights having bearings of different sizes, said bearings increasing successively in size from the upright at one end of the base to that in the other end thereof, a shaft of varying diameters mounted to rotate and slide in said bearings, a master cam fixed to said shaft between two of said uprights, a standard positioned on said base at one side of said shaft, a bar adjustable longitudinally on the top of said standard and having a roller at one end positioned in the path of said cam, means for exerting a yielding pull in one direction on said shaft whereby the master cam is held in yieldable engagement with said roller, and work holding means carried by one end of said shaft.

In testimony whereof I affix my signature in presence of two witnesses.

GEORGE L. BOWER.

Witnesses:
HARRY A. SIMONDS,
CHARLES E. WALTON.