W. C. ADAMS.

STOCK HOLDING ATTACHMENT FOR MILLING MACHINES.

APPLICATION FILED JAN. 28, 1914.

1,116,342.

Patented Nov. 3, 1914.

2 SHEETS—SHEET 1.

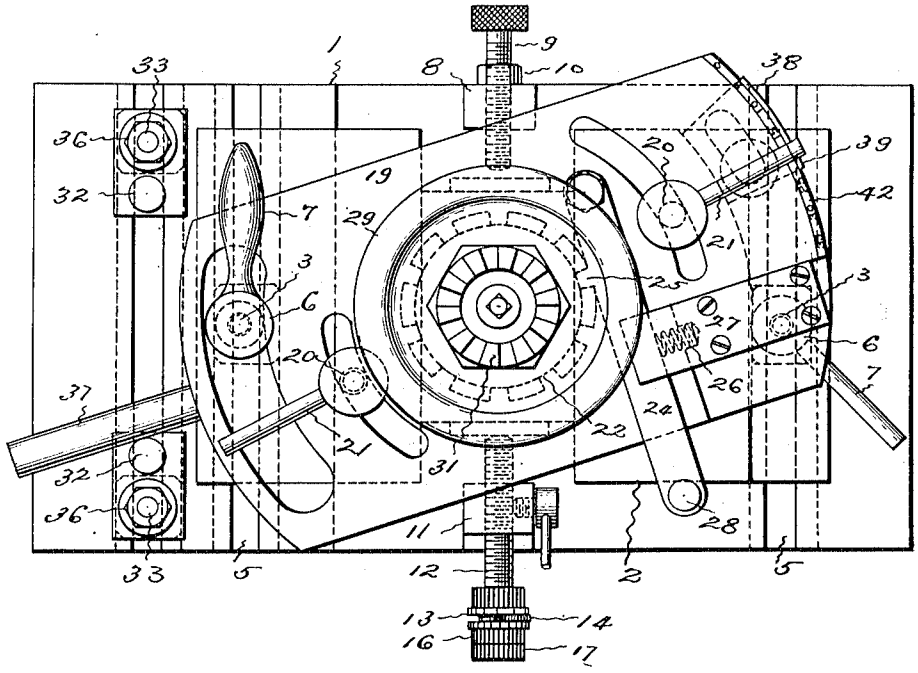


Fig. 1.

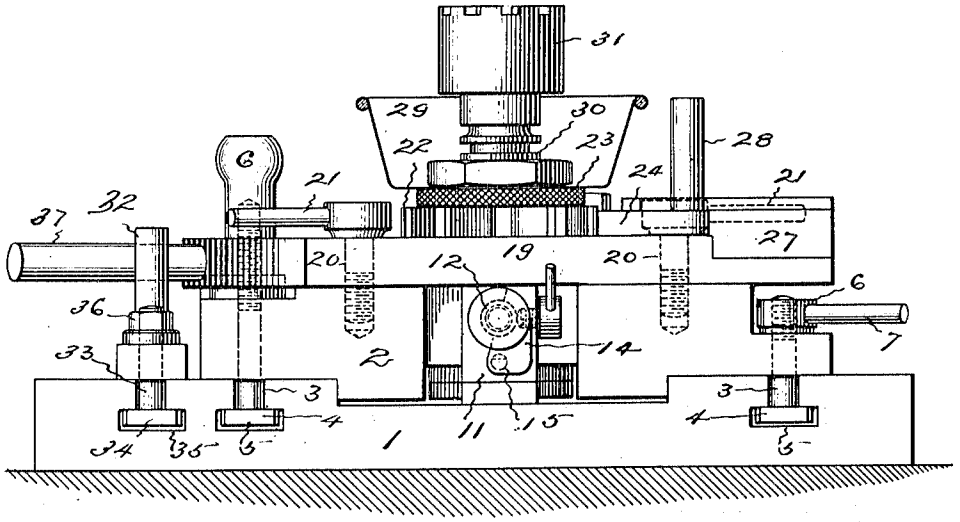


Fig. 2.

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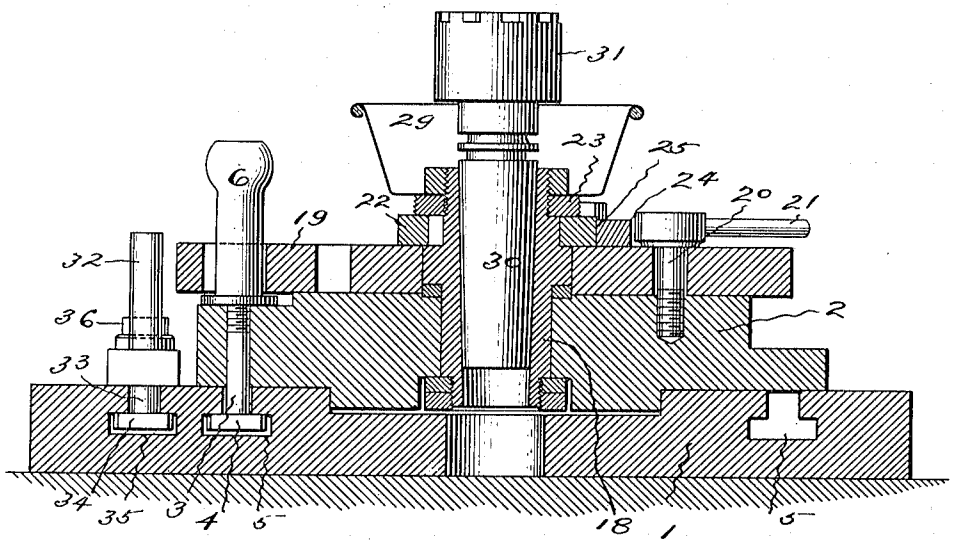


Fig. 3.

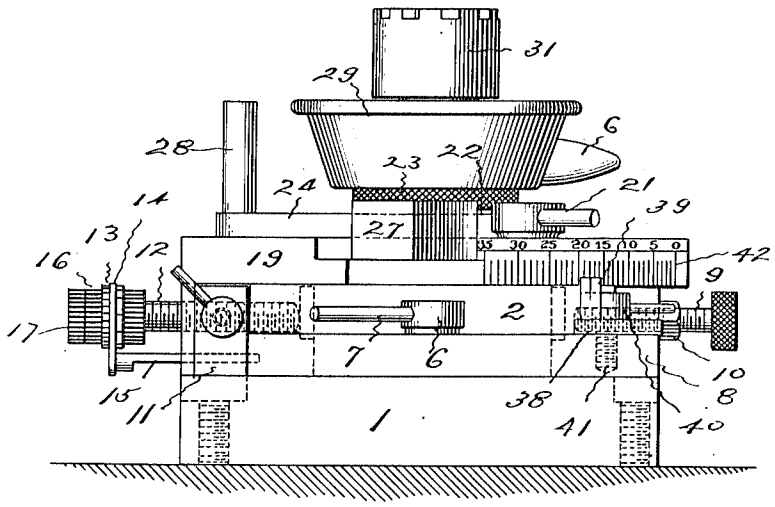


Fig. 4.

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UNITED STATES PATENT OFFICE.

WILLIAM C. ADAMS, OF HARTFORD, CONNECTICUT.

STOCK-HOLDING ATTACHMENT FOR MILLING-MACHINES.

1,116,342. Specification of Letters Patent. Patented Nov. 3, 1914.

Application filed January 28, 1914. Serial No. 814,863.

To all whom it may concern:

Be it known that I, WILLIAM C. ADAMS, a citizen of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented a new and useful Improvement in Stock-Holding Attachments for Milling-Machines, of which the following is a specification.

This invention relates to a mechanism which is designed to be attached to the bed of a milling machine for holding and feeding the stock to be operated on, and although the attachment may be used with many of the common forms of milling machines, it is particularly adapted for use with hand milling machines for holding and feeding circular pieces of stock on the ends of which teeth are to be cut for producing positive clutch members, bevel gears, and the like machine elements.

The object of the invention is to provide an attachment which can be built at a relatively low cost and readily attached to any of the common forms of milling machines, and which can be quickly adjusted by anyone in such manner that the desired work may be rapidly and accurately performed by comparatively unskilled labor.

The invention is illustrated in the accompanying drawings as embodied in an attachment which is designed for holding positive clutch blanks on the ends of which ten teeth are to be cut.

Figure 1 shows a plan of the attachment holding a ten-tooth clutch member. Fig. 2 shows a front elevation of the same. Fig. 3 shows a central vertical longitudinal section. Fig. 4 shows an end elevation.

The attachment has a base 1 which is designed to be fastened in any suitable manner to the bed of the milling machine with which it is to be used. On the top of the base and movable toward the front and the back with a portion extending into a suitable guide-way is a slide 2. Binders, consisting of screws 3 that extend through the slide and have heads 4 located in undercut slots 5 in the upper face of the base, and nuts 6 with handles 7, are provided for clamping the slide in any desired position in the path of its movement back and forth on the base. Attached to the upper face of the base back of the slide is a block 8 carrying a screw 9 with a binding nut 10. This screw forms an adjustable stop for determining the end of the backward movement of the slide. In the block 11 attached to the top of the base in front of the slide is a screw 12 which forms an adjustable stop for determining the end of the forward movement of the slide. On the screw 12 is a graduated collar 13 which, in coöperation with the finger 14, mounted on the end of a bar 15 that moves in and out of the base, shows the amount of rotation and consequently indicates the feed in and out of the screw. This graduated collar is attached to a thumb nut 16 by means of which it may be set, and it is clamped on the screw by the thumb nut 17. The graduations on this collar are preferably made so as to indicate each thousandth of an inch of movement in or out of the screw. By this means the position of the inner end of the screw can be very accurately determined for the purpose of exactly fixing the back and forth movement of the slide between the two stop screws.

At the center of the slide is an upwardly projecting tubular arbor 18. This arbor is free to rotate but is held from longitudinal movement in the slide which carries it. Turning freely on this arbor is a swivel plate 19. Binding screws 20 with handles 21 that extend through slots in the swivel plate into the slide are provided for clamping the swivel plate to the slide when it is so desired.

Keyed to the arbor above the swivel plate is the index ring 22. This index ring is provided with notches equal in number to the number of teeth to be cut on the stock which the attachment is to hold. The index ring is easily removable, being held in position by a nut 23, so that an index ring which has a number of notches equal to the number of teeth to be cut on the stock may be quickly applied to the arbor.

Pivoted to the swivel plate is a lever 24 with a tooth 25 that is adapted to engage the notches in the index ring. A spring 26 in the spring box 27 thrusts the lever so that the tooth will engage the notches in the index ring, a handle 28 being provided at the front end of the lever for turning the lever and withdrawing its tooth from the index notches. By the engagement of the tooth on the lever that is fastened to the swivel plate with a notch in the index ring, the spindle is connected with the swivel plate so that it will be turned therewith. When the lever is drawn back so as to disengage its tooth from an index notch, the

spindle may be turned independently of the swivel plate.

A receptacle 29 is desirably fastened on the upper end of the spindle for catching lubricating oil and the chips which result from the work. The interior of the tubular spindle is desirably tapering so that it will receive and hold the tapering shank 30 of the chuck that holds the piece of stock 31 to be worked.

On the base at one side of the bed are two adjustable stops 32 which are guided and may be fastened in the desired positions by bolts 33, which have heads 34 that are in the groove 35 in the upper face of the bed, and nuts 36 which turn on the ends of the bolts. Extending from the side of the swivel plate between these stops is a handle 37. By means of this handle the swivel plate may be turned back and forth the amount of movement, being limited by the engagement of the handle with the stops. On the other side the edge of the swivel plate is graduated in degrees for convenience in determining the amount of oscillation of the swivel plate. Pivoted on the slide is a plate 38 with an index finger 39, that is movable back and forth so as to coöperate with the graduations of the scale 42 on the edge of the swivel plate. A handled nut 40 is arranged on the pivot screw 41 for this plate in order that it may be clamped in the position to which it is set.

In setting up the attachment so that a particular piece of work may be accomplished, an index ring having a number of notches equal to the number of teeth to be cut on the stock is placed on the arbor. The slide is pushed toward the back against its back stop and the handle of the swivel plate is pushed back until it engages its back stop. The back stops are adjustable but are rarely moved except in extreme cases. The front micrometer slide stop is then loosened and turned up against the front of the slide and the graduated collar it carries set at zero and bound. The saddle of the machine carrying the cutter is set so that the back edge of the cutter is on a line with the center of the stock to be cut. The index finger on the small slide carried by the main slide is set until its zero line coincides with the zero of the graduations on the edge of the swivel plate and then bound. The micrometer slide screw which forms the front stop is then turned out a number of thousandths of an inch equal to the width of the cutter to be used and then bound. The slide is then pulled forward into contact with this front screw stop and clamped. The swivel plate handle is then pulled toward the front until the index on its edge registers with the index finger, the number of degrees which the swivel plate should be turned to give the proper pitch to the teeth to be cut. The swivel is then bound and the front swivel plate stop is moved back until it engages the swivel handle and it in turn is bound. The number of degrees which the swivel is to turn is ascertained by dividing 360 degrees by twice the number of teeth to be cut. The attachment is now ready for use. The slide is clamped in its rear position and the swivel is clamped with the handle in its rear position. After each cut is made the lever is forced to one side and the stock is turned one notch of the index ring until all of the teeth have been cut on one side. After all the teeth have been cut on one side, the slide is loosened and moved forward and the swivel is loosened and its handle turned to the front and the parts are again clamped. Then as the stock is indexed around all of the teeth will be cut on the other side.

This attachment is easy to adjust and when adjusted it can be used by anyone so as to index the stock and put it in position to be accurately cut. Any desired number of teeth, having any required pitch, may be cut on stock held by this attachment. This attachment eliminates the complicated indexing mechanisms used with the common gear cutting machines. When the bed is flat of course the teeth are cut flat. If it is desired to cut the teeth on an angle, such as for cutting bevel gears, the bed is simply tipped up at one end or the other so that the cuts will be on an incline. Clutch members or gears with any desired number of teeth having the required pitch may be accurately cut by this attachment.

The invention claimed is:

1. A stock holder having a base, a slide movable back and forth on the base, an arbor rotatably supported by the slide, a plate swiveled on the arbor, an index ring attached to the arbor, and means for connecting the index ring with the swivel plate so that the movement of the swivel plate will be communicated to the arbor.

2. A stock holder having a base, a slide movable back and forth on the base, means for clamping the slide in any desired position, an arbor rotatably supported by the slide, a plate swiveled on the arbor, an index ring attached to the arbor, and means for connecting the index ring with the swivel plate so that the movement of the swivel plate will be communicated to the arbor.

3. A stock holder having a base, a slide movable back and forth on the base, stops for determining the movement of the slide, an arbor rotatably supported by the slide, a plate swiveled on the arbor, an index ring attached to the arbor, and means for connecting the index ring with the swivel plate so that the movement of the swivel plate will be communicated to the arbor.

4. A stock holder having a base, a slide movable back and forth on the base, adjust-

able stops for determining the movement of the slide, means for indicating the amount of adjustment of one of the stops, an arbor rotatably supported by the slide, a plate swiveled on the arbor, an index ring attached to the arbor, and means for connecting the index ring with the swivel plate so that the movement of the swivel plate will be communicated to the arbor.

5. A stock holder having a base, a slide movable back and forth on the base, a tubular arbor supported by the slide and having a rotary but no longitudinal movement thereon, a plate swiveled on the arbor, an index ring attached to the arbor, and means for connecting the index ring with the swivel plate so that the movement of the swivel plate will be communicated to the arbor.

6. A stock holder having a base, a slide movable back and forth on the base, an arbor rotatably supported by the slide, a plate swiveled on said arbor, means for clamping the swivel plate to the slide, an index ring attached to the arbor, and means for connecting the index ring with the swivel plate so that the movement of the swivel plate will be communicated to the arbor.

7. A stock holder having a base, a slide movable back and forth on the base, an arbor rotatably supported by the slide, a plate swiveled on said arbor, a scale on the swivel plate, an index on the slide and coöperating with said scale, an index ring attached to the arbor, and means for connecting the index ring with the swivel plate so that the movement of the swivel plate will be communicated to the arbor.

8. A stock holder having a base, a slide movable back and forth on the base, an arbor rotatably supported by the slide, a plate swiveled on said arbor, a ring with index notches removably attached to the arbor, and means carried by the swivel plate for engaging the notches of the index ring.

9. A stock holder having a base, a slide movable back and forth on the base, an arbor rotatably supported by the slide, a plate swiveled on said arbor, a ring with index notches removably attached to the arbor, and a lever pivoted to the swivel plate and having a part adapted to engage the notches of the index ring.

10. A stock holder having a base, a slide movable back and forth on the base, an arbor rotatably supported by the slide, a plate swiveled on said arbor, a ring with index notches removably attached to the arbor, a lever pivoted to the swivel plate and having a part adapted to engage the notches of the index ring, a spring for causing the engagement of said lever with the index ring, and a handle for facilitating the disengagement of the lever and the index ring.

11. A stock holder having a base, a slide movable back and forth on the base, an arbor rotatably supported by the slide, a plate swiveled on said arbor, an index ring attached to the arbor, means for connecting the index ring with the swivel plate, and stops for limiting the swing of the swivel plate.

12. A stock holder having a base, a slide movable back and forth on the base, an arbor rotatably supported by the slide, a plate swiveled on said arbor, an index ring attached to the arbor, means for connecting the index ring with the swivel plate, stops adjustably attached to the base, and a handle projecting from the swivel plate for engagement with said stops in order to determine the movement of the swivel plate.

13. A stock holder having a base, a slide movable back and forth on the base, an arbor rotatably supported by the slide, a plate swiveled on said arbor, an index ring attached to the arbor, means for connecting the index ring with the swivel plate, and a receptacle carried by the arbor for receiving the chips resulting from the work.

14. A stock holder having a base, a slide movable back and forth on the base, adjustable stops for determining the movement of the slide, means for clamping the slide, an arbor rotatably supported by the slide, a plate swiveled on said arbor, means for clamping the swivel plate to the slide, an index ring removably attached to said arbor, means for connecting the index ring with the swivel plate, and stops for limiting the movement of the swivel plate.

15. A stock holder having a slide, adjustable stops for determining the movement of the slide, means for clamping the slide, an arbor rotatably supported by the slide, a plate swiveled on said arbor, means for clamping the swivel plate to the slide, an index ring removably attached to said arbor, means for connecting the index ring with the swivel plate, and stops for limiting the movement of the swivel plate.

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