

(No Model.)

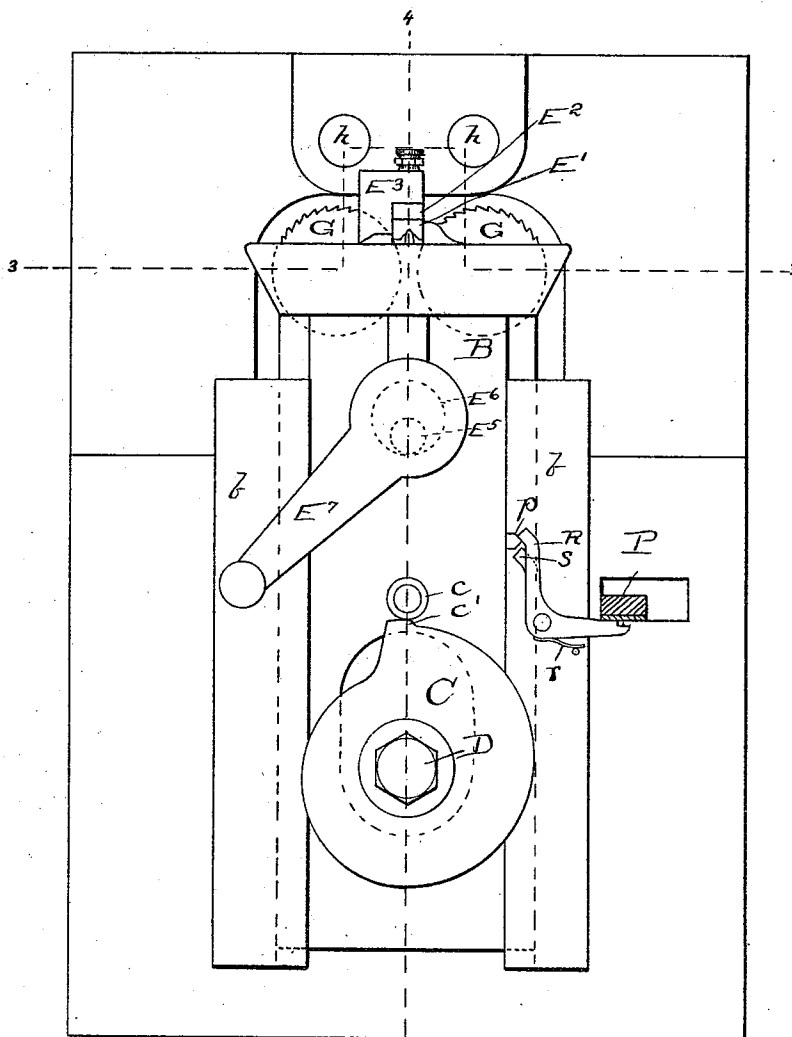
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C. E. ROBERTS.
KNIFE MILLING MACHINE.

No. 554,796.

Patented Feb. 18, 1896.

FIG. 1.



WITNESSES:

Lew E. Curtis

H. M. Munday

INVENTOR:

CHARLES E. ROBERTS.

BY *Munday, Curtis & Adcock.*

HIS ATTORNEYS.

(No Model.)

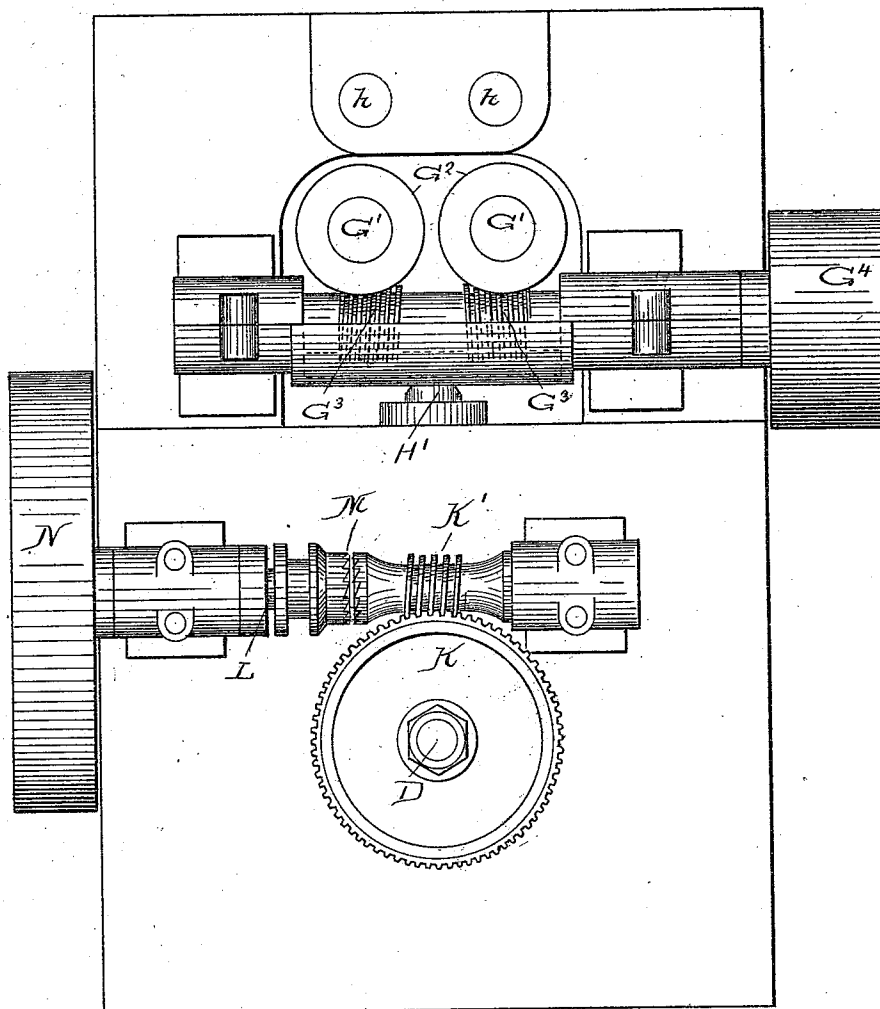
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Patented Feb. 18, 1896.

FIG. 2.



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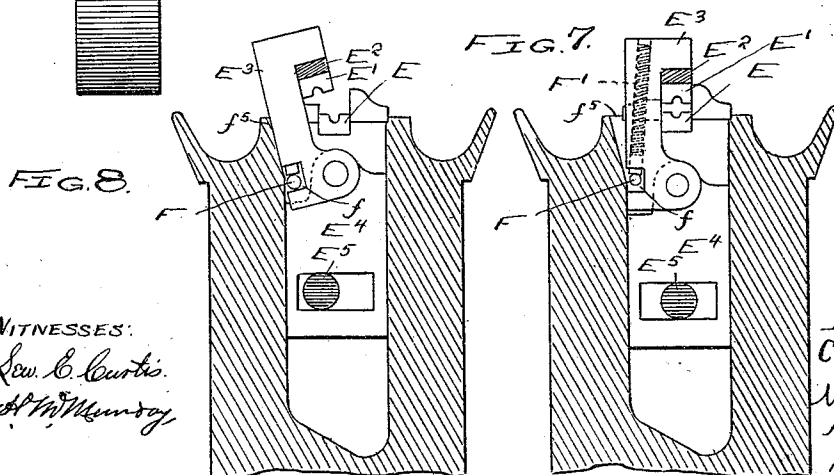
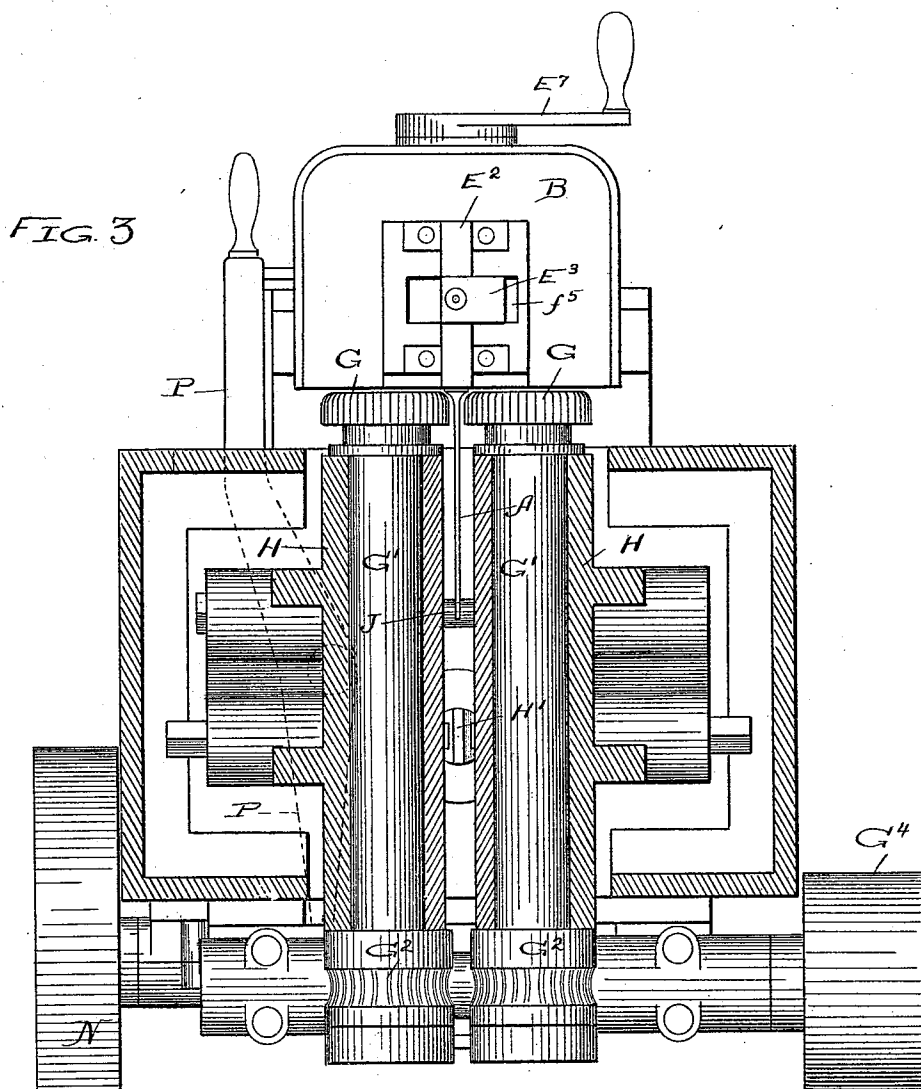
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KNIFE MILLING MACHINE.

No. 554,796.

Patented Feb. 18, 1896.



WITNESSES:

Sam. C. Curtis.
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INVENTOR:
CHARLES E. ROBERTS
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(No Model.)

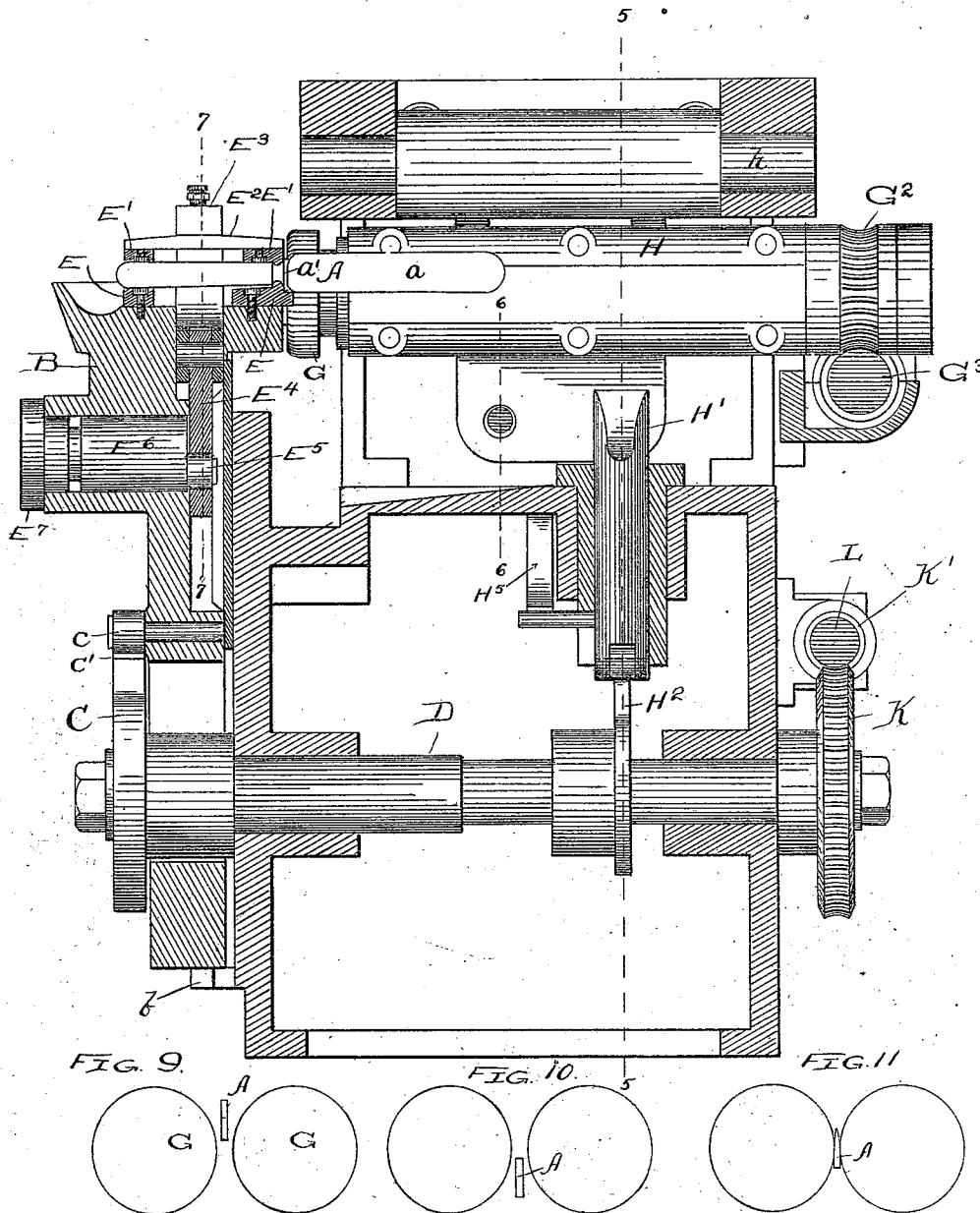
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C. E. ROBERTS.
KNIFE MILLING MACHINE.

No. 554,796.

Patented Feb. 18, 1896.

FIG. 4.



WITNESSES:

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(No Model.)

5 Sheets—Sheet 5.

C. E. ROBERTS.
KNIFE MILLING MACHINE.

No. 554,796.

Patented Feb. 18, 1896.

FIG. 5.

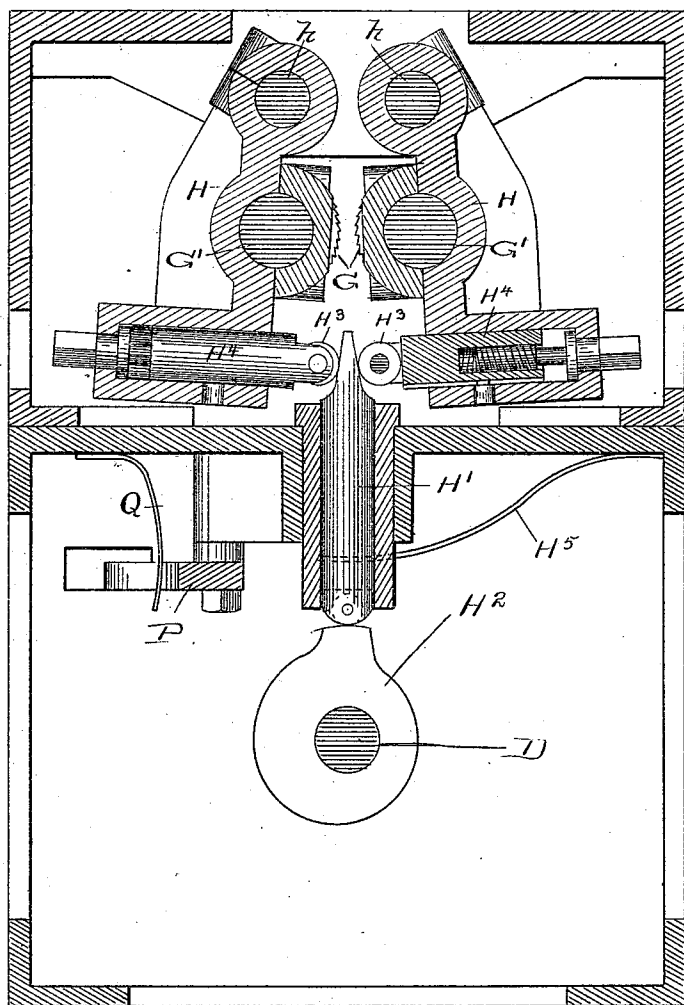
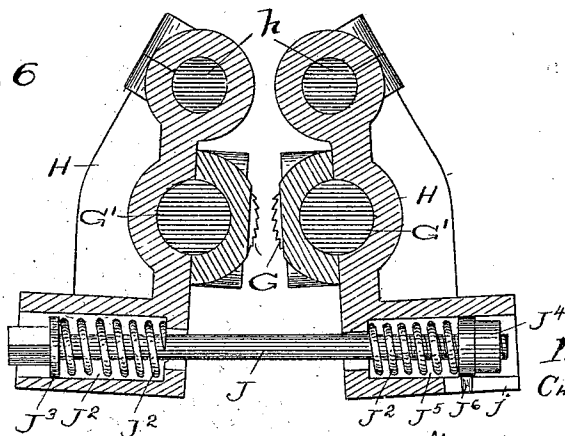


FIG. 6



WITNESSES:

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A. W. Munday

INVENTOR:

CHARLES E. ROBERTS

BY Munday, Barto & Adcock,

HIS ATTORNEYS.

UNITED STATES PATENT OFFICE.

CHARLES E. ROBERTS, OF OAK PARK, ASSIGNOR TO THE NATIONAL CUTLERY COMPANY, OF ROCKFORD, ILLINOIS.

KNIFE-MILLING MACHINE.

SPECIFICATION forming part of Letters Patent No. 554,796, dated February 18, 1896.

Application filed February 11, 1895. Serial No. 538,037. (No model.)

To all whom it may concern:

Be it known that I, CHARLES E. ROBERTS, a citizen of the United States, residing in Oak Park, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Knife-Milling Machines, of which the following is a specification.

The machine forming the subject of this invention is designed for the finishing of the sides of the base of the blade of the blanks of table-knives—that is to say, that portion of the blade, say, one-half or three-quarters of an inch in length, immediately adjoining the bolster. The machine is also adapted to smooth and impart a finish to the curved side face of the bolster, which vanishes in the surface of the blade. It has been my aim to adapt the machine to perform this operation so perfectly that the part cut by the machine will be perfectly shaped and thereby enabled to serve as a gage or guide in the subsequent operation of finishing the blade.

The invention consists in the novel construction of the several parts and in the novel combination of parts hereinafter set forth and described, and will be fully understood from the subjoined description and the accompanying drawings, in which—

Figure 1 is a front elevation, and Fig. 2 a rear elevation, of the machine. Figs. 3 and 4 are sections on the lines 3 3 and 4 4 of Fig. 1, respectively. Figs. 5, 6, and 7 are sections on the lines 5 5, 6 6, and 7 7, respectively, of Fig. 4. Fig. 8 is a sectional view similar to Fig. 7, showing the holder for the knife-blank in the open position. Figs. 9, 10, and 11 are diagram views showing different positions of the knife-blank during the operation of the machine. Fig. 12 is a partial view of a knife-blank, showing the portion operated upon by the machine.

In said drawings, A represents the knife-blank operated upon in the machine, a being the blade and a' the bolster thereof. The machine cuts or finishes that portion of the blank lying between the crown of the bolster and the point indicated by a^2 , finishing the broad sides of the blade and in fact all thereof except the top edge.

For the purpose of supporting the blank while in the machine a holder adapted to

clamp it rigidly is provided. This holder consists of a carrier B and a suitable clamping device mounted thereon. The slide moves vertically in ways b , being actuated upwardly by the cam C upon the cross-shaft D and downward by its own gravity. The carriage carries a roller c , which rides upon the cam. The cam is so shaped as to allow a quick descent and a gradual rise by the carriage, and at the end of the operation upon each blank said roller is left resting upon the point c' of the cam, which elevates the carriage above the milling-tools and renders it easy for the operator to remove the finished blanks and insert fresh ones.

The clamping devices consist of stationary jaws E, rigidly secured to the carriage B, and movable jaws E' supported upon a cross-bar E^2 , secured to a swinging head E^3 , pivoted upon a slide E^4 , moving vertically in ways in the carriage B and controlled in such movement by a pin E^5 eccentrically mounted upon a short shaft E^6 also supported in the carriage, and actuated by the hand-lever E^7 . The jaws are each preferably made in two parts, as shown, so they may take hold of the knife-handle at the ends thereof, and the portions of the jaws which act upon the end of the handle adjacent to the blade are also shaped so they may fit into the groove in the blank adjacent to the bolster and thus be enabled to withstand any end-thrust action by the milling-tools upon the blank. All the jaws are also shaped so they may grasp the handle at its edges.

At F is a pin stationarily secured in the carriage B and extending horizontally into a recess f in the swinging head E^3 . A spring F' in the head bears upon this pin, and as soon as the downward movement of the slide begins the spring imparts a quick movement to the head, carrying it from the open position (shown at Fig. 8) to a position over the blank, and the continued downward movement of the slide then brings it down into bearing contact with the knife-blank. When the slide is moved up by the eccentric, the swinging head is automatically opened by the contact of the pin F with the under side of recess f , as will be readily understood. The upper end of the slideway is cut away at one side, as

shown at f^5 , to allow the head E^3 to swing open, as shown at Figs. 7 and 8, which show the operation of the movable jaw very closely.

I employ with the vertically-moving blank-holder two milling-cutters G , whose axes are parallel to each other and to the blank. They are positioned one at each side of the path through which the blank is carried by the holder, and each is adapted to mill one side of the blank, and in order that they may conform in their operation to the shape of the blank they are mounted each in a swinging frame H , supported at their tops upon pivots h , whose axes are parallel to those of the cutters. The frames are forced apart at the bottom by a vertically-sliding wedge H' , controlled by a cam H^2 upon the shaft D , and are normally drawn together to the extent permitted by the wedge by a connecting-rod J and the springs J^2 encircling the ends of said rod between the head J^3 and nut J^4 upon the rod and the inner ends of the recesses J^5 formed in the swinging frames and adapted to receive the rod and springs. The nut J^4 has a pin J^6 moving in the slot j in the frame, whereby said nut is held against rotation. The milling-cutters are mounted upon shafts G' , having bearings in said frames, and receiving power in opposite directions through the worm-gears G^2 thereon and the oppositely-inclined worms G^3 upon the same shaft with pulley G^4 . The wedge H' acts against antifric-tion-rollers H^3 , secured in adjustable blocks H^4 H^4 , carried in the lower ends of the swinging frames. The movement of these swinging frames changes the positions of the cutters so slightly as to require no special provision therefor in the actuating worm and gear. The millers are allowed to come close to each other at the beginning of the cut, and thus insure the formation of the ordinary sharp edge upon the blank, and they are gradually forced apart as the cut proceeds. A spring H^5 keeps the wedge in bearing-contact with its cam.

The cam-shaft D is driven by a worm-gear K , meshing with a worm K' upon a shaft L , and the worm K' receives power through the clutch M upon shaft L from the drive-pulley N . The lever for opening and closing the clutch is shown at P , and the spring Q acts upon it in a direction to maintain the open position of the clutch.

Latches R S , each having an operating-spring r , (only one spring being shown,) are employed to hold the clutch-lever in position with the clutch closed while the machine is operating, and thus relieve the operator of this labor, and the stop p upon the holder-carriage releases these latches at proper times.

In the operation of the machine the blank is first carried from the position indicated at Fig. 9 to that shown at Fig. 10, this movement being a quick one permitted by the abrupt side of cam C and the cutters being

spread by the wedge so as to prevent interference by them. The wedge is now lowered so as to permit the cutters to come close together and against the blank, and the holder commences a slow upward movement, during which the milling is done, the sides of the sharp edge being first cut and the cut then proceeding toward the back or thick edge as the blank travels upward. Each blank will be cut while the cam-shaft describes a complete revolution.

While I have shown the cutters as mounted in swinging frames, it will be understood that they may be otherwise supported and have other than a swinging motion to and from the work. They may also be forced toward the work by devices other than springs.

The work done in this machine is very uniform and is largely due not only to the cutters and their controlling mechanism, but also to the accurate positioning of the knife-blank by the jaws which enter the grooved neck of the blank.

I claim—

1. The combination with a rising and falling knife-holder, of two milling-cutters having horizontal axes, and journaled in swinging frames located at opposite sides of the path of the knife-holder, means for impelling said frames toward the work, and means for forcing them away from the work as the cutting proceeds, substantially as specified.

2. The combination with a rising and falling knife-holder, of two milling-cutters having horizontal axes, and journaled in swinging frames located at opposite sides of the path of the knife-holder, a yielding connection between said frames acting to draw them together, and means for forcing said frames away from the work as the cutting proceeds, substantially as specified.

3. The combination with a moving knife-blank holder, of a milling-cutter journaled in a frame located at one side of the path traversed by the blank and adapted to swing toward and from the work, a second milling-cutter journaled in a similar swinging frame located at the other side of the path traversed by the blank, a wedge for moving the frames so as to carry the cutters away from the work as the cutting proceeds, means for controlling the movements of the wedge, and a yielding connection between the frames adapted to draw them against the wedge, substantially as specified.

4. In a machine for milling knives, the combination of two milling-cutters having axes which remain parallel in all positions to which they may be moved by their supports, two frames swinging upon pivots parallel to said axes, and each supporting one of the cutters, and means for moving the frames toward each other, substantially as specified.

5. The combination with the moving knife-blank holder, of milling-cutters having paral-

lel axes and supported in frames swinging on pivots arranged parallel to the axes of the cutters, said pivots being located above the cutters, and means for controlling the swinging of the frames, substantially as specified.

5 6. The combination with the moving knife-blank holder, of milling-cutters supported in swinging frames adapted to move toward and away from the blank, a movable wedge for spreading the frames, a spring connection for keeping them normally against the work, and a cam for imparting a variable movement to the wedge; substantially as specified.

10 7. The combination with milling-cutters for milling knife-blanks, of a holder consisting of the moving carriage, the clamping-jaw stationary upon the carriage, and the movable clamping-jaw pivoted to a slide moving in ways upon the carriage, substantially as specified.

20 8. The combination with milling-cutters for milling knife-blanks, of a holder consisting of the moving carriage, the clamping-jaw stationary upon the carriage, the recessed clamping-jaw pivoted to a slide moving in ways upon the carriage, the spring actuating said

recessed jaw and the stud or pin compressing the spring, substantially as specified.

9. The combination with the stationary jaw of the clamping device, of a swinging and 30 vertically-moving opposing jaw, a spring and stationary pin for imparting a quick swinging movement to the jaw in positioning it for grasping the blank, and a moving slide carrying the jaw against the pin to cause it to 35 open and release the blank, substantially as specified.

10. The combination with companion cutters movable toward and away from the work, and means for controlling them in these move- 40 ments, of a knife-blank holder adapted to first carry the blank between and beyond the cutters, before the latter are brought together, and then to carry the blank between the cutters while they operate upon it, and a cam 45 adapted to impart said movements to the holder, substantially as specified.

CHARLES E. ROBERTS.

Witnesses:

CHARLES H. ROLLINS,
MICHAEL W. GILTINON.