

(No Model.)

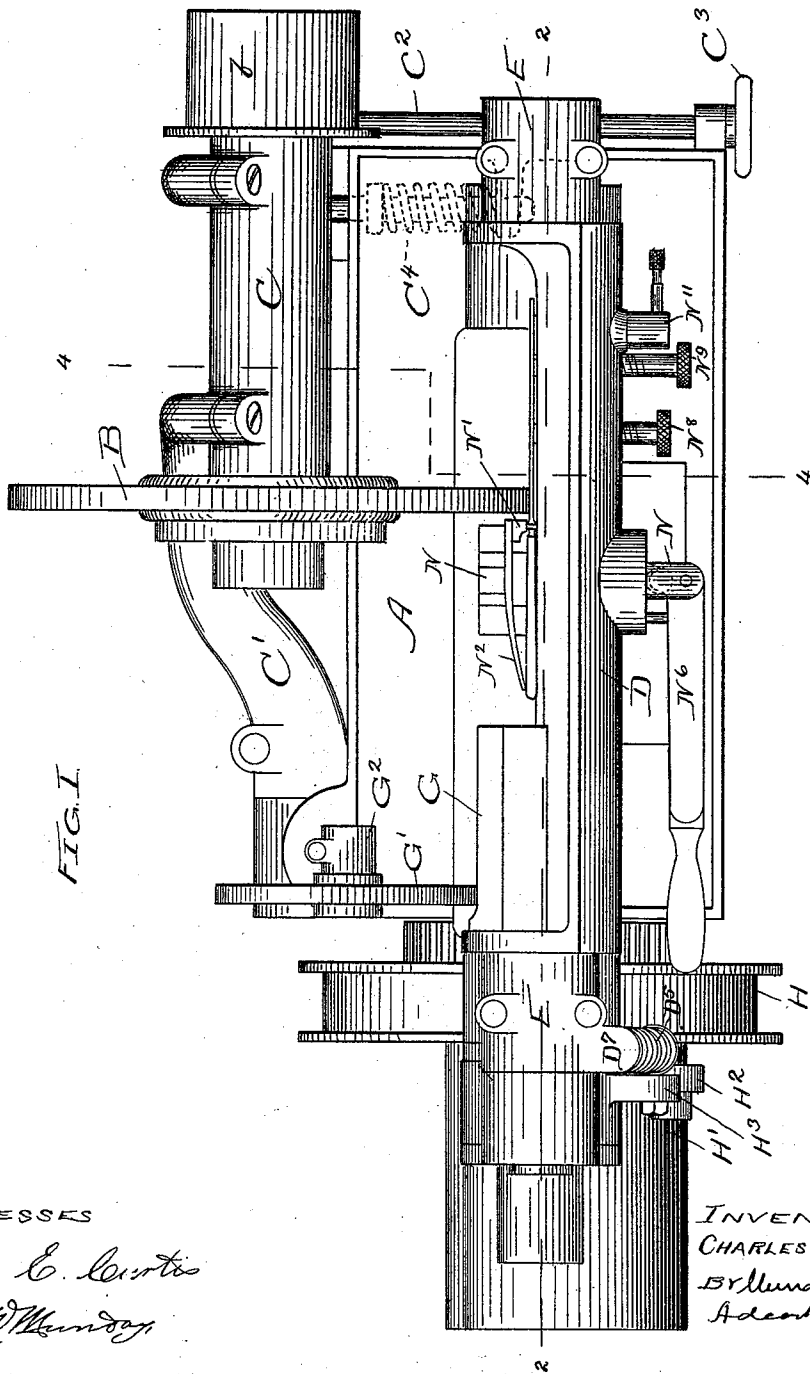
4 Sheets—Sheet 1.

C. E. ROBERTS.

MACHINE FOR GRINDING BLADES OF TABLE CUTLERY.

No. 547,893.

Patented Oct. 15, 1895.



WITNESSES

Sew. C. Curtis
A W Munday

INVENTOR:
CHARLES E. ROBERTS
BY Munday, Barto &
Adcock.

HIS ATTORNEYS.

(No Model.)

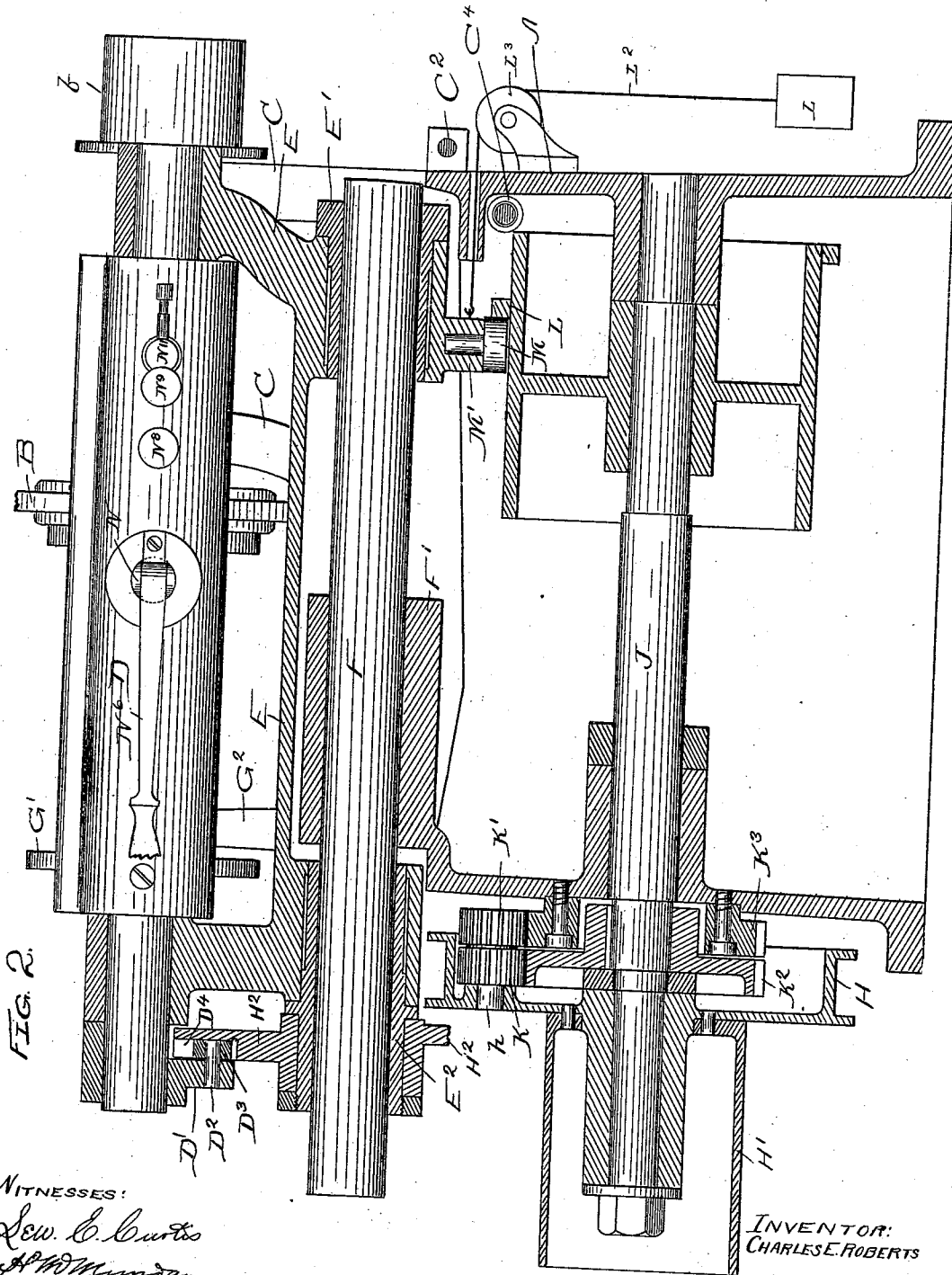
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No. 547,893.

Patented Oct. 15, 1895.



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(No Model.)

4 Sheets—Sheet 4.

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FIG. 5.

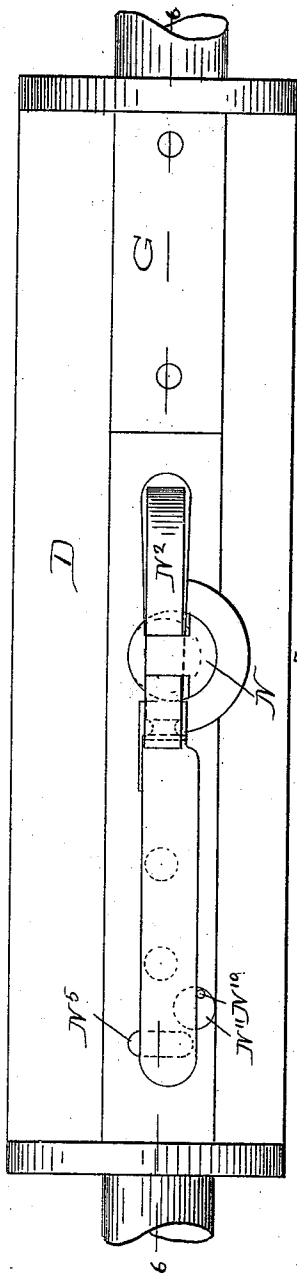


FIG. 6.

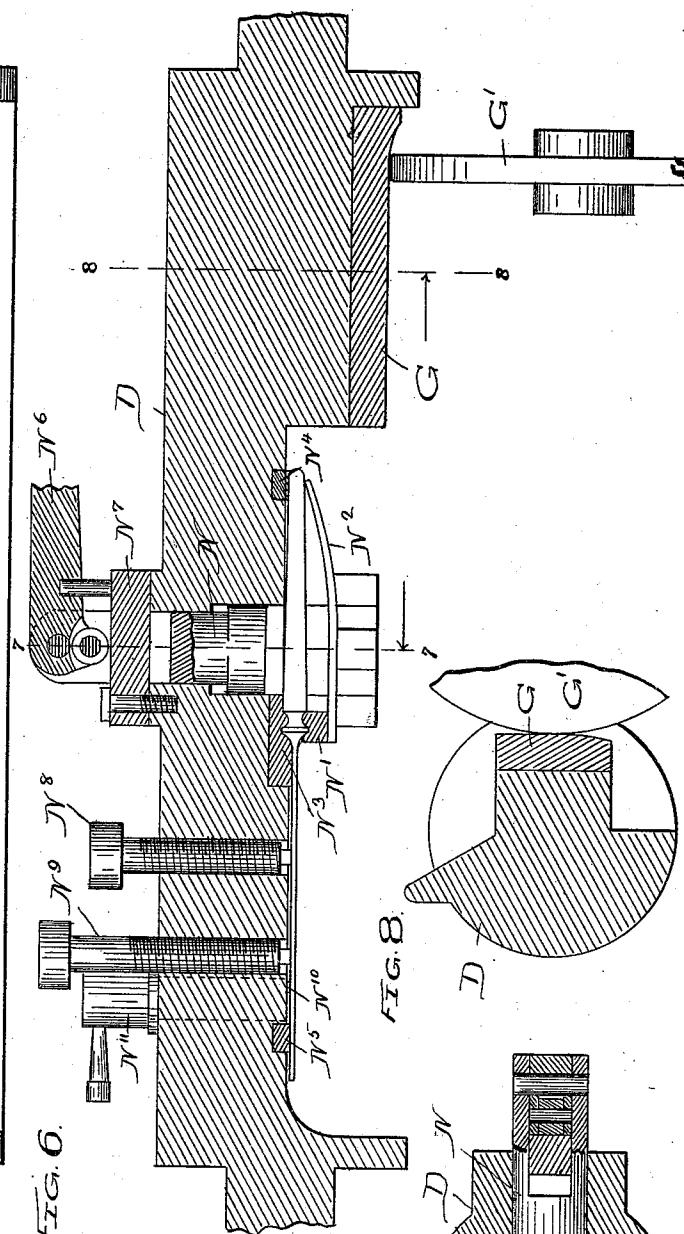


FIG. 8.

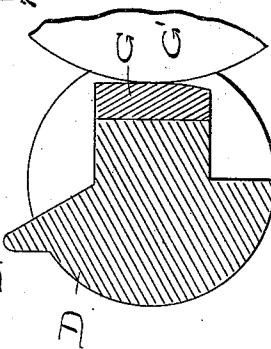
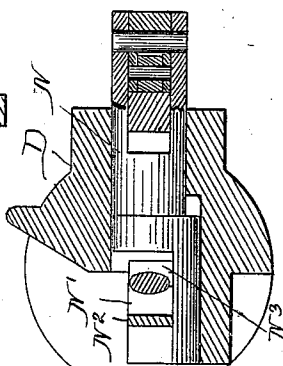


FIG. 7.



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UNITED STATES PATENT OFFICE.

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

MACHINE FOR GRINDING BLADES OF TABLE-CUTLERY.

SPECIFICATION forming part of Letters Patent No. 547,893, dated October 15, 1895.

Application filed February 11, 1895. Serial No. 538,040. (No model.)

To all whom it may concern:

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

This invention relates to a machine for the automatic grinding of the blades of table and similar knives. In this machine the knife is secured to a holder which is pivotally supported and adapted to oscillate to the extent necessary to give a rounded surface to the blade, and it is mounted in a frame which is also pivotally supported and adapted to oscillate in obedience to a form. The holder and form are also actuated in a longitudinal direction to the extent required to carry the blade across the face of the grinding-wheel. The oscillation of the knife-holder is caused by a heart-shaped cam and a bell-crank lever, one end of the latter being actuated by the cam and the other end whereof being joined to an arm projecting from the holder in such manner as to rock the holder when the lever is actuated by the cam. A spring opposes this oscillation and maintains the lever in bearing-contact with the cam. All these features of the machine are fully disclosed in the accompanying drawings, wherein—

Figure 1 is a plan view; Fig. 2, a longitudinal vertical section upon the line 2 2 of Fig. 1. Fig. 3 is an end elevation. Fig. 4 is a section on the line 4 4 of Fig. 1. Fig. 5 is an enlarged side elevation of the knife-holder. Fig. 6 is a section on the line 6 6 of Fig. 5; and Figs. 7 and 8 are sections on the lines 7 7 and 8 8, respectively, of Fig. 6.

In the drawings, A represents a suitable supporting-frame, upon which the moving parts of the machine are supported. B is the grinding-wheel, receiving its power from the pulley *b* and journaled upon a frame C pivotally supported upon a pivot C' at the bottom of the frame and adapted to be swung to and from the work by an adjusting-screw C², having a hand-wheel C³ for operating it. A spring C⁴ bears constantly against the frame C and

takes up any slack or looseness which may exist at the adjusting-screw. The work is supported and moved across the face of the grinder by mechanism which will now be described. At D is a knife-holder, pivotally supported at its ends in a carriage E, which is in turn supported upon a stationary shaft F, having a bearing at F' in the main frame. The carriage E is free to rock upon shaft F and also to slide thereon, being provided with bushings E' and E² encircling the shaft. The knife-holder carries a form G, which is at all times in contact with a stationarily-located wheel G', supported upon the main frame by a standard G². A spring G³, encircling a sliding rod G⁴, carrying an antifriction-roller G⁵ at its upper end, bears against the arm E³ at the side of the carriage E opposite to that upon which the form and form-wheel are located and opposes the latter, so that the form is kept steadily against the wheel.

H is a belt-pulley mounted upon the shaft J, supported in the lower part of the frame and attached to this pulley is a heart-shaped cam H', made long in the direction of its axis, so that it may act in any position of the carriage E. An elbow-lever H², freely mounted upon the bushing E² as a pivotal support, bears at its lower end upon this cam, and at its upper end it is jointed to an arm D', depending from the knife-holder, by means of a pin D², secured in a slide D³, moving in a suitable way or recess D⁴, formed in the upper end of the lever. It will be seen from this construction that when the lever is actuated by the cam a rocking movement will be imparted to the knife-holder. In order to retain the lever in contact with the cam, I provide a spring D⁵, encircling a sliding rod D⁶, passing through a horizontally-extending arm H³ upon the lever H² and confined between said arm and the collar H⁴ upon the rod, the rod being stepped at its upper end in an arm D⁷, projecting from the knife-holder carriage E. The pressure of the spring D⁵ being downward upon the lever the latter is thereby kept closely against the cam and actuated in both directions, so as to cause a limited and regulated rocking of the knife-holder. As

the cam moves in unison with the drive-pulley H, it follows that this oscillating or rocking movement of the holder will occur at each revolution of the pulley.

5 For the purpose of imparting a longitudinal movement to the carriage E necessary to carry the work across the grinding-wheel I provide the following mechanism: The pulley H is loose upon the shaft J, and a pinion
10 K and a companion pinion K' are journaled upon a stub-shaft h, secured in the web of said pulley H. Pinions K and K' are made fast together, and the pinion K meshes with a gear K², rigidly secured upon the shaft J,
15 while the pinion K' meshes with a gear K³, which is secured to the main frame and therefore stationary. The drive-pulley and the cam being both loose upon the shaft J it results that when the drive-pulley is in motion
20 it carries the pinions with it, and the pinions are also compelled to rotate upon their own axis by reason of the fixed character of the gear K³, and this motion is transmitted through the gear K² to the shaft J. The station-
25 ary gear has one or more teeth in excess of the number of teeth upon the moving gear K², and consequently each time the pinions are carried around the main shaft a movement will be imparted to the gear K² and the
30 shaft equivalent to the number of excess teeth upon the stationary gear. This movement is of course very slow, and desirably so, because it enables me to impart a slow longitudinal movement to the carriage E through
35 the medium of the cam L upon shaft J and a roller M, carried in a depending leg M', formed upon the carriage E. The carriage is returned at the end of each operation by a weight L', attached to the carriage by a cord
40 L² passing over a pulley L³.

For the purpose of properly securing the knife to the holder I employ the following devices: Passing transversely through the holder is a slide N', having at its acting end
45 a jaw N', adapted to conform to the bolster portion of the knife-blank, and a spring N², adapted to bear against the outer end of the knife-handle. A stationary jaw N³, also shaped to conform to the bolster, is let into the holder
50 opposite the jaw N', and stationary abutment-blocks N⁴ and N⁵ are also provided in the holder at the points indicated. The slide is drawn outward in such manner as to force the jaw N' and the spring against the knife
55 by a hand cam-lever N⁶. This cam-lever bears upon a block N⁷, secured to the holder and passing through a recess in the slide. For the purpose of supporting the middle portion of the knife-blade during the operation
60 of grinding and preventing any tendency which it may have to bow or yield under the thrust of the grinder, I provide the screws N⁸ and N⁹. I also place a support under the knife-blade at its farther end, consisting of a
65 pin N¹⁰, eccentrically mounted in a short shaft

N¹¹, adapted to be turned by hand. My purpose in making this pin adjustable is in order that it may be raised to support the back edge of the blade when the other side thereof is ground. The knife is usually placed in the
70 machine first with the cutting-edge down, and after one side of the blade has been ground in this position it is reversed and the form changed, the pin N¹⁰ being raised to support the blade in the reversed position.
75

I claim—

1. The combination in a machine for grinding, of a pivoted holder for the blank to be ground adapted to oscillate, an oscillating and sliding carriage supporting the holder,
80 automatic means for imparting the oscillating movement to the holder, automatic means for oscillating the carriage, and automatic means for sliding the carriage, substantially as specified.
85

2. In a knife grinding machine, a holder pivotally supported and provided with a clamp adapted to act upon the knife handle, mechanism for imparting oscillation to the holder, a carriage for said holder adapted
90 both to oscillate and to slide, means for sliding the carriage and means for oscillating it, substantially as specified.

3. The combination with the grinding wheel, of the oscillating knife holder, a longitudinally moving and oscillating carriage supporting the holder, and a lever and cam for oscillating the holder, said lever moving with the carriage, substantially as specified.
95

4. The combination with the grinding wheel, of the oscillating knife holder, a longitudinally moving carriage supporting said holder, the cam, the lever operated by the cam, and a spring acting upon the lever to keep it against the cam, substantially as specified.
100 105

5. The combination with the grinding wheel, of an oscillating knife holder, an oscillating carriage supporting said holder, the cam, lever and spring for oscillating the holder, and the form, the opposing roller and
110 the spring for oscillating the carriage, substantially as specified.

6. The combination in a knife holder of a knife holding clamp and a vertically adjustable support N¹⁰ for the edge of the blade,
115 substantially as specified.

7. The knife holder having the vertically adjustable support N¹⁰ for the edge of the blade, substantially as specified.

8. The knife holder having one or more adjusting screws N⁸ N⁹, bearing against the side of the blade and a vertically adjustable support N¹⁰ substantially as and for the purpose set forth.
120

9. In a machine for grinding table knives, the holder having a slide N, bolster clamping jaws N' N³, spring N², bearing upon the blank and the cam lever acting to draw the slide in tightening the clamp, substantially as specified.
125 130

10. In a grinding machine, the combination with the grinder, of an oscillating holder for the work, a form roller and spring for controlling the holder, and an oscillating and sliding support for such holder, substantially as specified.

knife at the bolster, and a spring N² adapted to bear upon the rear of the handle, substantially as specified.

CHARLES E. ROBERTS.

Witnesses:

CHARLES H. ROLLINS,
MICHAEL W. GILTINON.

11. The knife holder having clamping devices consisting of jaws, adapted to seize the