(No Model.) 4 Sheets—Sheet 1.

A. JOHNSTON.

CUTLERY BOLSTER GRINDING MACHINE.

No. 534,396. Patented Feb. 19, 1895.

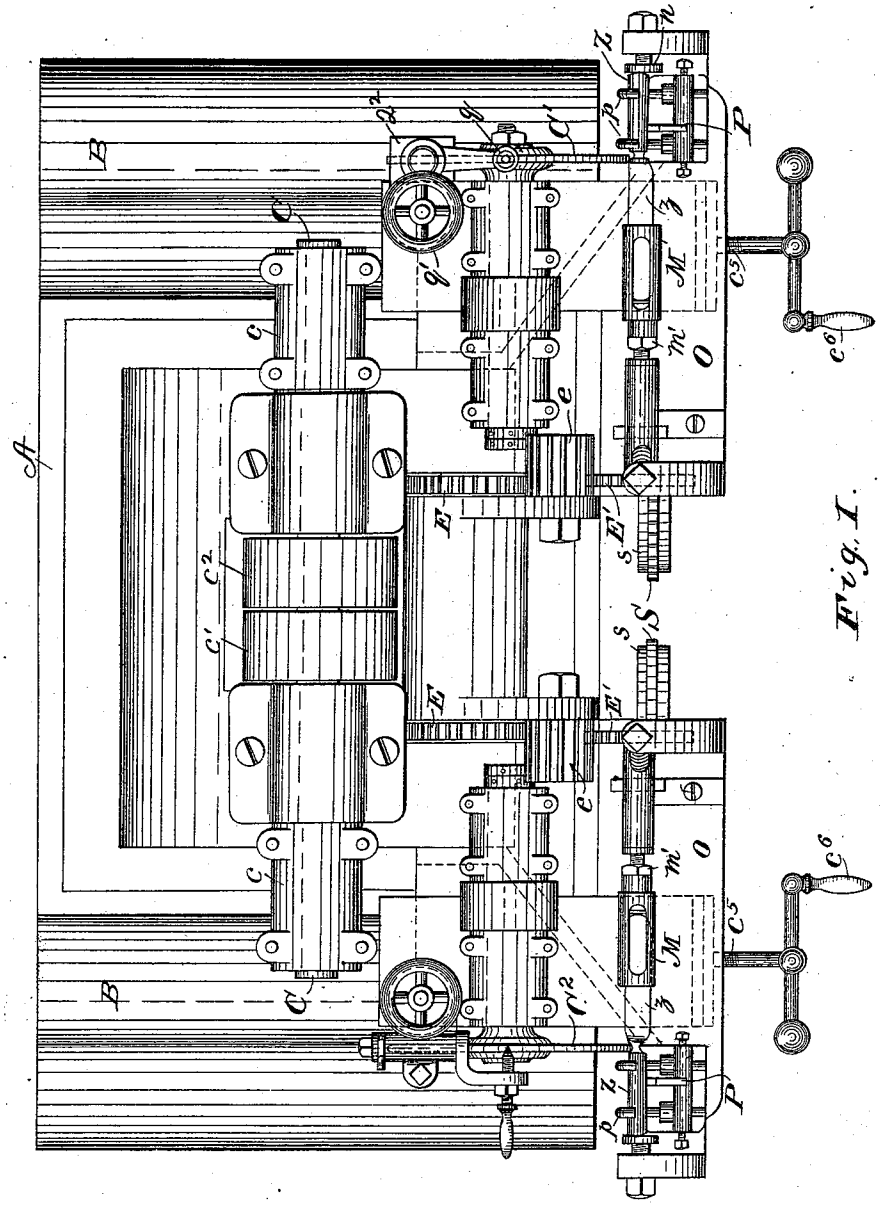

Fig. 1.

Witnesses.
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Percy Lewis

Inventor.
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by Pollock & Mauro
his attorneys

(No Model.) 4 Sheets—Sheet 2.

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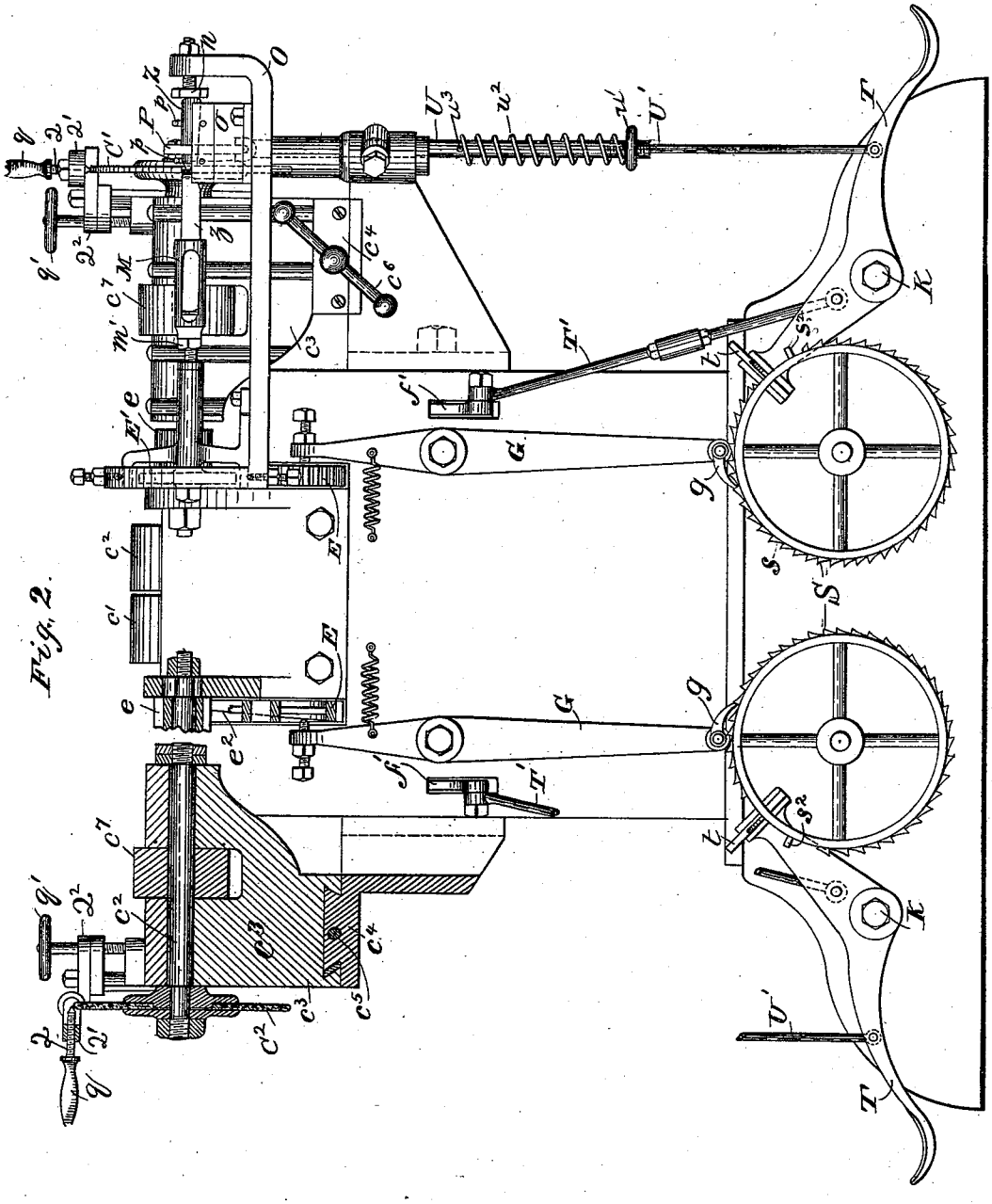

Fig. 2.

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A. JOHNSTON.

CUTLERY BOLSTER GRINDING MACHINE.

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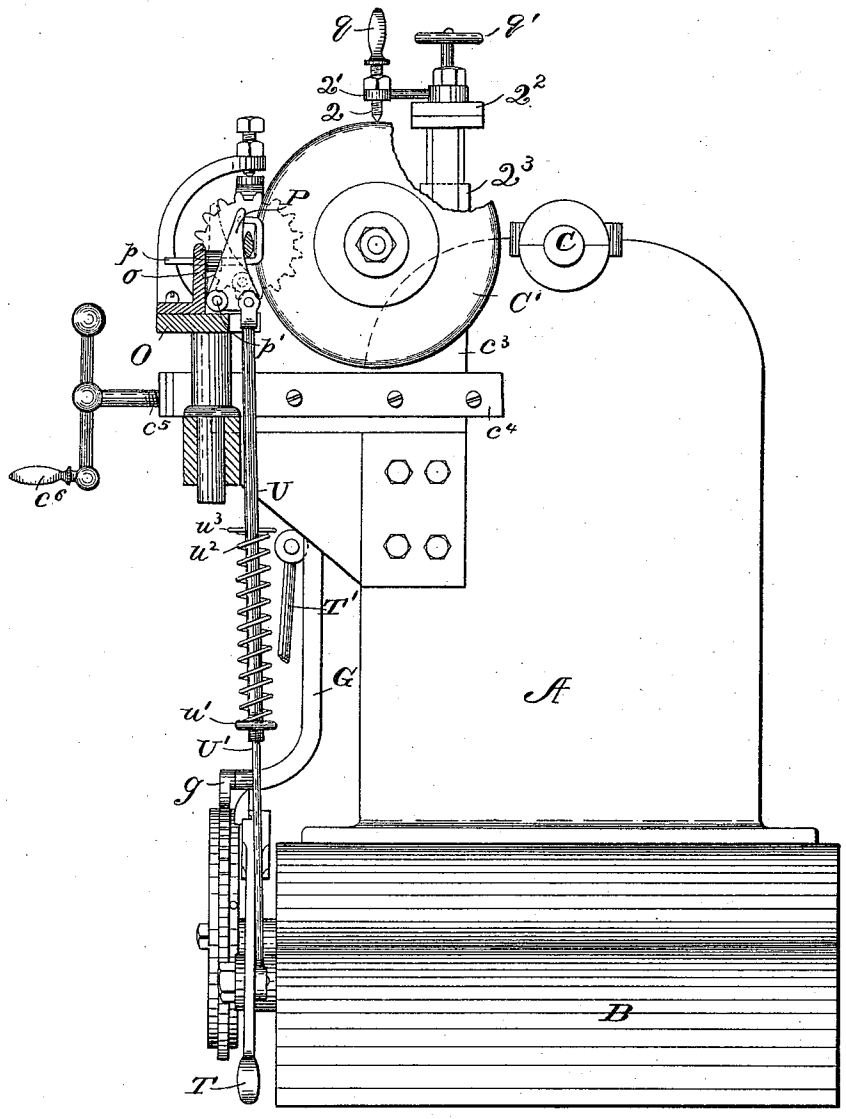
Fig. 3.



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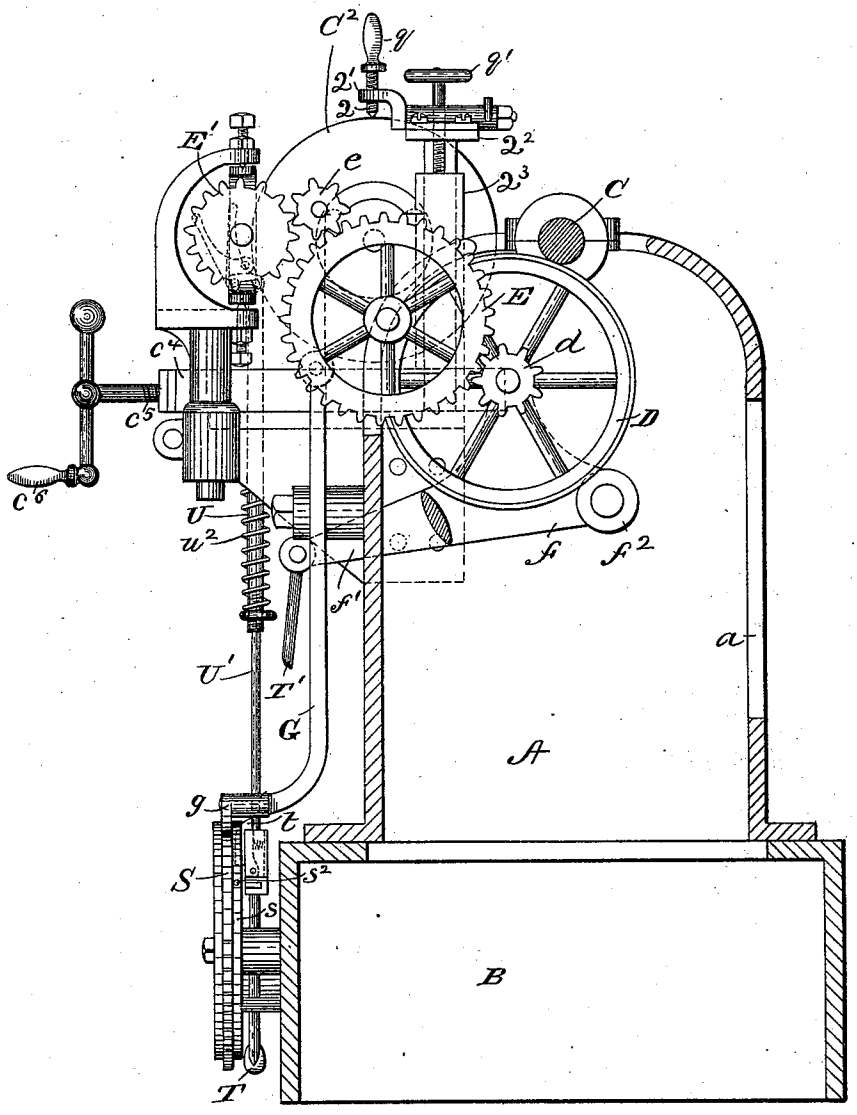
(No Model.) 4 Sheets—Sheet 4.

A. JOHNSTON.

CUTLERY BOLSTER GRINDING MACHINE.

No. 534,396. Patented Feb. 19, 1895.

Fig. 4.



Witnesses
W. R. Edelen.
Geo. Lowe.

Inventor.
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his attorneys

UNITED STATES PATENT OFFICE.

ALLEN JOHNSTON, OF OTTUMWA, IOWA.

CUTLERY-BOLSTER-GRINDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 534,396, dated February 19, 1895.

Application filed October 16, 1894. Serial No. 526,068. (No model.)

To all whom it may concern:

Be it known that I, ALLEN JOHNSTON, of Ottumwa, Iowa, have invented a new and useful Improvement in Cutlery-Bolster-Grinding Machines, which is fully set forth in the following specification.

This invention has reference to mechanism for grinding the bolsters of table knives and forks, and its object is to provide automatic machinery for that purpose. Prior to this invention these parts of knives and forks have been ground by hand.

The bolster is of irregular form, being, like the handle itself, nearly flat on the sides and sharply curved on the edges. This applies both to the top or ridge of the bolster and to the neck or groove. According to the present invention the knife or fork is held loosely in a revolving holder, and the handle is pressed with yielding pressure against a rest, which limits and determines the position of the work with reference to the grinding wheel. Consequently the handle itself acts as a former, causing the wheel to grind to the required depth at all points, and to a shape corresponding with the outline of the handle. If a different shape is required for the bolster, a separate former may be slipped on to the handle of the knife or fork.

The grinding wheel necessarily has a thin edge, and hence is quickly worn away. To compensate for wear the wheel is mounted on a slide as is common. To keep the edge of the wheel in proper shape a truing tool or device is provided, which tool is journaled and movable across the edge of the wheel in a line corresponding to the required shape of the latter. The support of the truing tool is also adjustable toward the axis of the wheel so that its position may be changed as the wheel wears away.

Other features of the invention will be pointed out in the following detailed description, in which reference is made to the drawings accompanying this specification.

In the drawings Figure 1, is a top plan view of a machine constructed in accordance with the invention. Fig. 2 is a side elevation, partly in section. Fig. 3 is an end elevation, partly in section. Fig. 4 is a vertical cross-section.

The drawings illustrate a double machine, that is, a machine with two grinding wheels, and accessory parts.

As shown the wheel C′ to the right (Figs. 1 and 2) is used to grind the top or ridge of the bolster, and that to the left (C^2) the hollow or neck. This is merely a matter of convenience since the work could be done on different machines, or on the same machine with different wheels.

The frame-work and many of the moving parts of the machine are similar to those of machines described in my applications of even date herewith, serially numbered respectively 526,066 and 526,067. This is also a matter of convenience, permitting the use of the same patterns for parts of the blade-polishing, handle-grinding and polishing and bolster grinding-machines.

I do not claim herein the improvements which are common to the several machines, and which are claimed in one or the other of said applications.

A represents the main frame; B, the base or pedestal on which it is mounted, and C the main shaft suitably mounted in bearings in frame A.

The means for communicating motion to the several moving parts, which means constitute no part of the present invention, will be briefly described.

Shaft C communicates motion to a friction wheel D, whose shaft is journaled in a swinging frame *f* pivoted to the main frame at f^2 (Fig. 4). Wheel D is thrown into and out of gear with the main shaft as hereinafter described. On the shaft of wheel D is a pinion *d*, which drives a gear E. The latter through pinion *e* and gear E′ drives the revolving work-holder M.

Frame *f* has an arm *f′* extending forwardly through a slot in frame A, and to the end of the arm is pivoted a connecting rod T′ pivoted at its lower end to a treadle T. The latter is pivoted to base B at K and at its inner end carries a latch *t* which when the machine is in operation rests on the rim *s* of a ratchet-wheel S, as shown in Fig. 2. In that position rod T′ holds up frame *f*, keeping wheel D in engagement with the main shaft. This engagement continues until a pin s^2 on rim *s* dislodges latch *t* from its seat on the latter, permitting treadle T and frame *f* to drop, and

arresting the movements of the parts driven from wheel D.

Wheel E, above referred to, has on one face a cam surface e^2 (Fig. 2) which oscillates a lever G which carries at its lower end a pawl g in engagement with the ratchet-wheel S. The latter thus moves step-by-step at a slow speed compared with that of the holder, until one revolution is completed, when the action of pin s^2 on latch t takes place as above described.

Treadle T is connected also with a pitman U which at its upper end is pivoted to the finger P by which the work is pressed against the grinding wheel. Finger P is also pivoted to its support at p' (Figs. 3 and 4). Consequently when the inner end of treadle T descends, as above described, pitman U is raised throwing holding finger P away from the work, as indicated in dotted lines. When the outer end of treadle T is depressed, raising the inner end and engaging latch t with the rim of wheel S, the holding finger P is by the same movement brought into operation against the handle of the knife or fork.

The parts mentioned in the foregoing description are duplicated in the double-machine shown in the drawings, but one description suffices for both sets of mechanism.

The revolving work-holder M has a hollow socket to receive and hold the blade z of a knife or fork, and is adjustable to varying lengths of work by means of a nut m' in a well known manner. The handle Z of the article to be ground rests at its end against an adjustable stop n carried by the support O of the work holder. This support has an upright plate o in which are secured the outer ends of the bent rods p, which constitute the rest for the handle Z and whose position determines the depth of cut of the grinding wheel. Holding finger P lies between the two rods p and presses the blade toward the upright positions of the latter, permitting the wheel to cut until the motion of the handle against the wheel is arrested. The pressure of finger P is yielding so that, as the article turns presenting alternately its sides and edges to the wheel the finger moves sufficiently to compensate for the difference between the thickness and width of the handle. This yielding pressure is effected by the action of a spring u^2, which surrounds the upper part of pitman U. This part is tubular, and in it slides the end of the lower part U', which carries a pin u^3, projecting through a slot in tubular part U. Spring u^2 is compressed between this pin at its upper end, and thumb-nut u' at its lower end, and its pressure may be varied by turning said nut in one direction or the other.

Although it will be understood from the foregoing description that the rotation of the handle will (owing to the difference between the thickness and width thereof) through the movement of the finger P cause a slight variation in the pressure exerted by the spring u^2 during each revolution of the handle, such variation is not of the essence of the invention herein. Means for varying the pressure of the handle against the grinding or polishing wheel, are, however, broadly claimed in my pending application, filed of even date herewith, and serially numbered 526,067.

From the foregoing description it will be understood how the bolster is automatically ground to proper depth at all points.

The edge of the grinding wheel being quite thin would quickly lose its proper shape unless means to prevent it were provided. Such means comprises a truing tool Q carried by a pivoted arm Q' and having a handle q for conveniently moving it across the edge of the wheel. Wheel C' which grinds the top of the bolster should have simply a plane flat edge. Consequently the truing tool is arranged to move directly across the edge, as shown in Figs. 1, 2 and 3. Wheel C^2, which grinds the hollow or neck must have a rounded edge. Consequently its truing device is pivoted as shown in Fig. 1, so as to swing in an arc corresponding to the curved outline of the edge. The support Q^2 to which arm Q' is pivoted is mounted to slide in a standard Q^3, and provided with an adjusting wheel q', so that the tool may be adjusted toward the axis of the wheel as the latter wears away.

Each grinding wheel has its arbor c^2 supported in bearings in a slide C^3 mounted on an extension C^4 of the frame, the arbor being provided with a driving pulley c^4. The slide C^3 may be moved to bring the wheel nearer to or farther from the work by any suitable means, such as an adjusting screw c^5 provided with an operating handle c^6.

It will be obvious from the foregoing description that parts of the invention may be used without others, and that modifications may be made in details of construction.

What I claim is—

1. In a machine for grinding the bolsters of table-knives and forks, the combination with the grinder, of a revolving work-holder, a fixed rest for the handle of the article, and means for pressing the handle during grinding against the rest with yielding pressure whereby the handle acts as a former to determine the shape of the bolster, substantially as described.

2. The combination with a grinding wheel having its edge conformed to the shape to be given the bolster of a knife or fork, of a work-holder, means for revolving the holder with the work in contact with the grinding-wheel, a fixed rest against which the handle bears during the grinding, and a spring-actuated finger pressing the handle against the rest with yielding pressure whereby the handle acts as a former to determine the shape of the bolster, substantially as described.

3. The combination with the grinding-wheel, of a revolving work-holder for holding a knife or fork, a rest embracing the handle of the

article on two sides, a spring-actuated finger pressing the handle against the rest and the bolster against the wheel with yielding pressure, substantially as described.

4. The combination with the grinding-wheel, of a revolving work-holder, a fixed rest embracing the handle of the article being ground on two sides, a spring-actuated finger bearing against the handle on the third side, and means for automatically arresting the revolving holder and throwing back the finger after the grinding has proceeded for a predetermined time, substantially as described.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

ALLEN JOHNSTON.

Witnesses:
A. G. HARROW,
ALFRED BRIGGS.