

(No Model.)

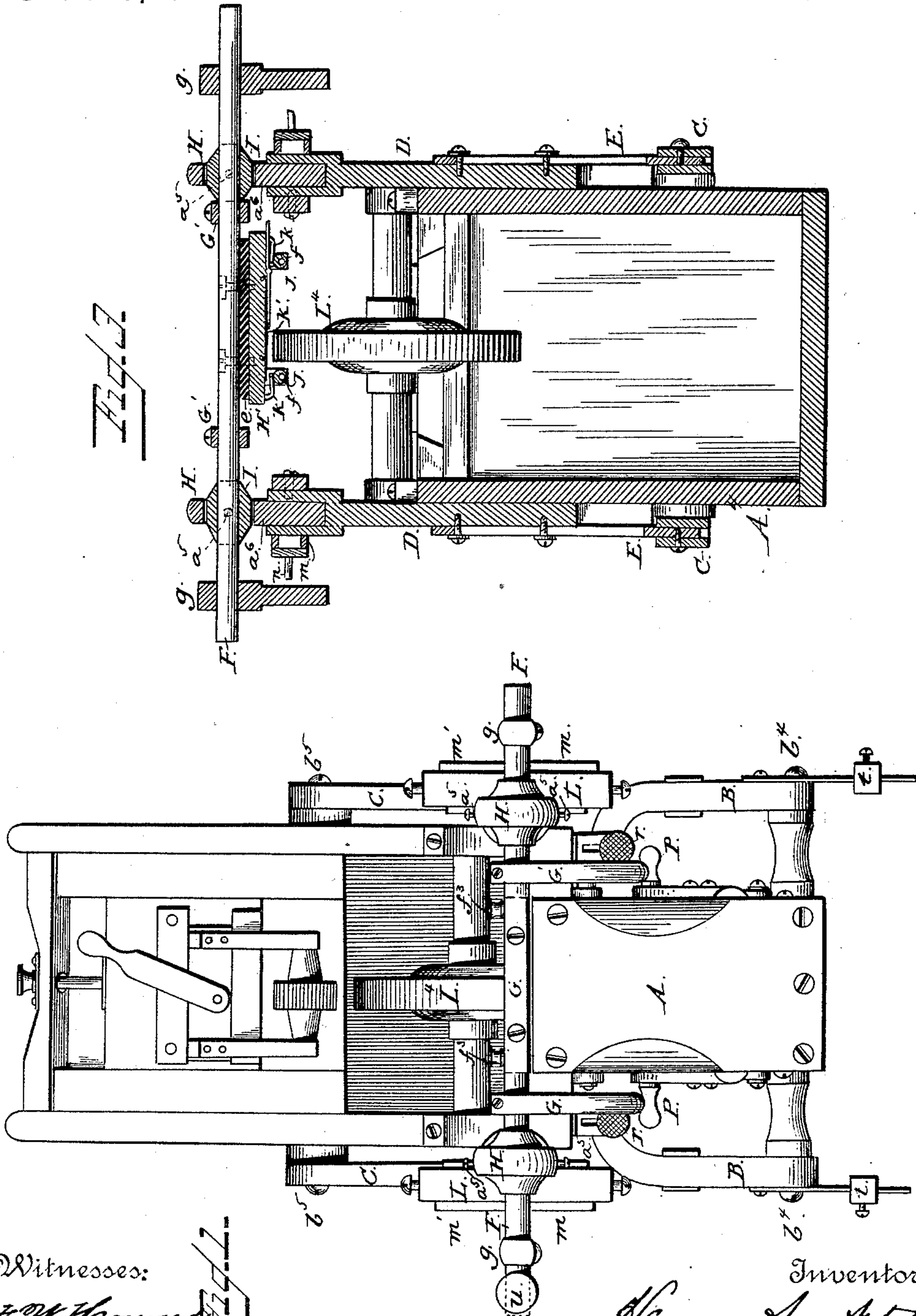
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H. A. AXTELL.

GRINDING MACHINE FOR CUTLERY.

No. 393,497.

Patented Nov. 27, 1888.



Witnesses:

J. M. Howard  
E. M. Phillips

Inventor:

Henry A. Axtell.

By his Attorney

Chas. W. Dunn.

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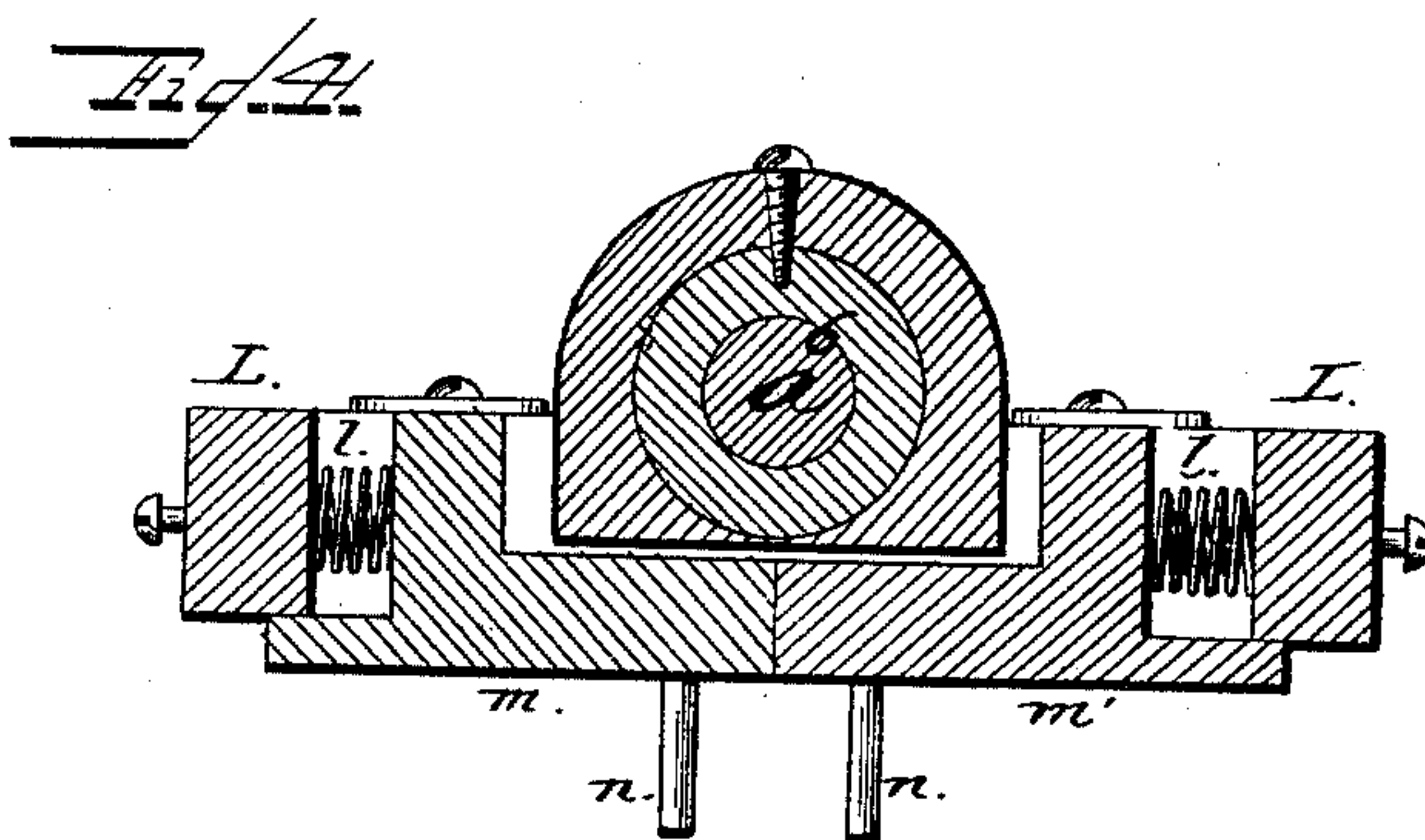
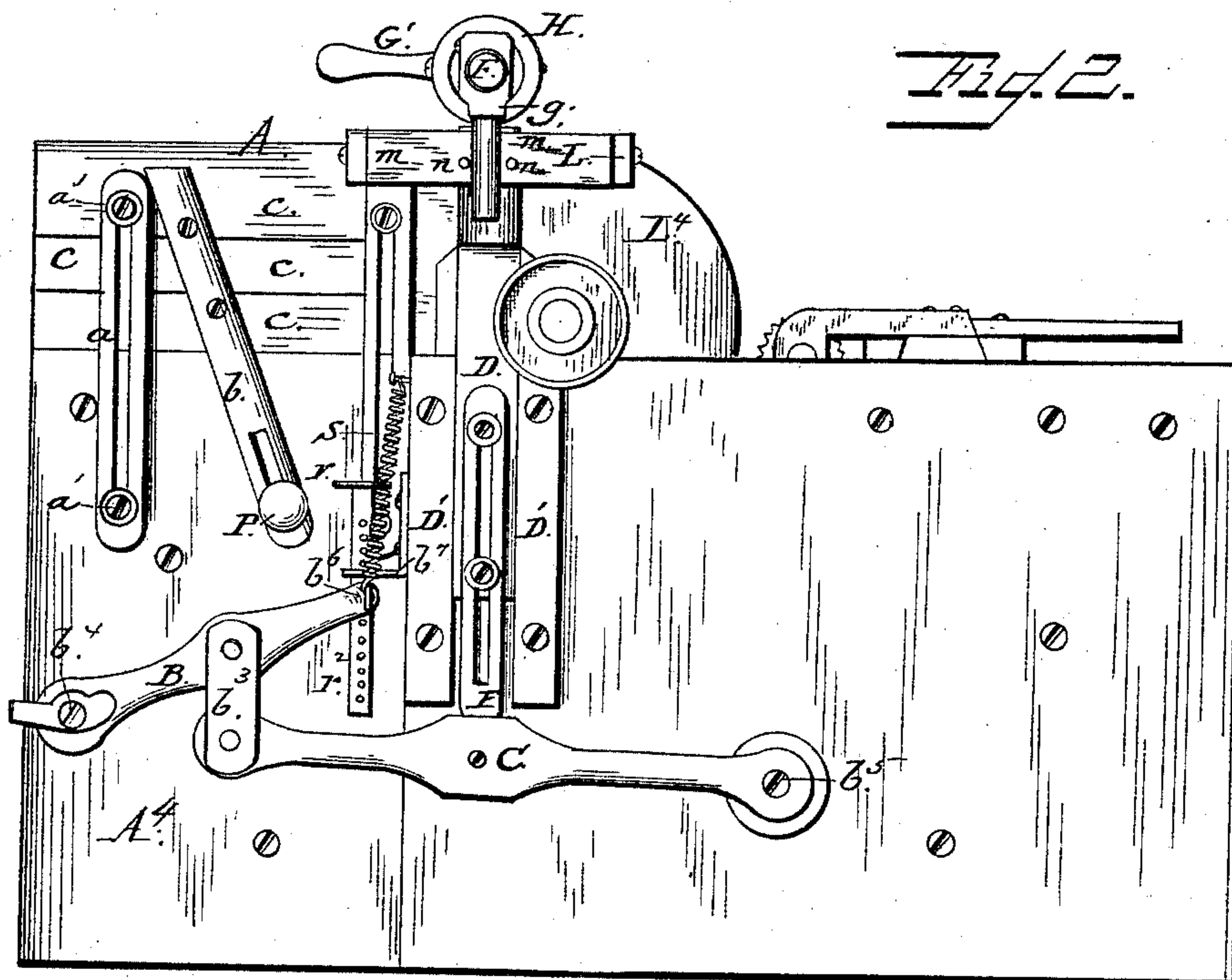
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# UNITED STATES PATENT OFFICE.

HENRY A. AXTELL, OF MONTAGUE, ASSIGNOR TO THE JOHN RUSSELL CUTLERY COMPANY, OF TURNER'S FALLS, MASSACHUSETTS.

## GRINDING-MACHINE FOR CUTLERY.

SPECIFICATION forming part of Letters Patent No. 393,497, dated November 27, 1888.

Application filed July 1, 1887. Serial No. 243,114. (No model.)

*To all whom it may concern:*

Be it known that I, HENRY A. AXTELL, a citizen of the United States, residing at Montague, in the county of Franklin and Commonwealth of Massachusetts, have invented a new and useful Machine for Grinding the Blades of Table and other Knives, of which the following is a true and full specification.

My invention is an improvement in machinery employed to facilitate the holding and grinding of knife-blades for table and other use after they have passed from the forge.

In grinding knives, commonly, the blades are placed in a temporary holder or "flat stick," as it is called, and held upon a revolving stone, behind and somewhat above which the operator sits and bears down with all the force and strength he can command. As all marks of the forge have to be ground out and brought down smooth and even, so that the blades will have a perfect finish, and as said blades are not of a uniform thickness, this becomes a very laborious and trying task to the operator, especially his arms, breast, and stomach muscles.

My invention is for the purpose of making the work of grinding less laborious to the operator and allow him to utilize his feet and limbs as well as the upper portion of his body in his work.

The invention consists, chiefly, of a frame sustaining a movable shaft which holds the knife to be ground, the said shaft being controlled by short handles or levers in the hands of the operator seated upon a saddle located behind the grindstone, the necessary pressure being applied to the blade by the aid of foot-levers.

In the drawings illustrating my invention, Figure 1 is a top view of the machine. Fig. 2 is a side elevation of the same. Fig. 3 is a section on the line of the shaft F. Fig. 4 is a section through the box L, showing springs, &c.

Similar reference-letters indicate like parts in all of the figures.

Referring to the drawings, A is the saddle on which the grinder sits, located conveniently to the grindstone L, and supported upon a suitable foundation or base. The saddle is

composed of several horizontal layers of material, c, which may be taken out or replaced to lower or raise it to the proper elevation, and a seat made to conform to the body of the operator. Bars a, slotted from their lower ends upward, are secured by suitable bolts, a', to the foundation A, and also the seat of the saddle.

b b are slotted bars permanently secured obliquely to the saddle A, which have at their lower ends foot-rests P, adjustable in said slots to suit the legs of the operator. These rests form stirrups to support the feet of the operator when he is not using them to bear down, through the foot-levers, upon the stone in grinding.

B and C are compound levers united by links b<sup>3</sup>, the former of which are pivoted in the foundation or base at b<sup>4</sup> and the latter pivoted at b<sup>5</sup> in said base. To the ends b<sup>6</sup> of the levers B and the foundation or base are secured spiral springs S, and to said ends b<sup>6</sup> are secured treadles r, provided with shanks r<sup>2</sup>, perforated for purposes of adjustment, said shanks being movable vertically in guides b<sup>7</sup>, attached to said base.

D D are posts movable vertically in dovetail guides D'. Slotted bars E are adjustably secured to the posts D and pivoted centrally to the lever-arms C. The purpose of the slotted bars E is to adjust the relations between the levers C and posts D, to compensate for the wear of the stone in the operation of grinding. The posts D terminate at their upper ends in collars H, hereinafter to be mentioned.

A shaft, F, is journaled in annular bearings I, which are pivoted upon pins a<sup>5</sup>, after the manner of gimbal-rings, in the collar H. By means of these pivoted bearings a slight rocking motion is allowed to the shaft F within said collars when one or the other end of the said shaft is moved vertically by the operator from the levers B C.

The collars H are provided with shanks a<sup>6</sup>, which fit in sockets secured to the posts D, and are there secured by suitable set-screws. By releasing said shanks from their sockets the collars H may be lifted, together with the shaft F, when for any purpose it becomes necessary to do so, entirely from place. On the



shaft F, between the posts D and the knife-holder, are handles G', by which, in the hands of the operator, the said shaft and that which it carries may be easily handled. The knife-  
 5 holding device is composed of a metallic bar, H', on the outer ends of which are journaled eccentric-rollers J. Secured to the bar H' are spring-clamps k, which when borne upon by the said eccentrics, the knife being in posi-  
 10 tion, are pressed down to form holds about the bolsters of the knives, to keep the latter in position in the operation of grinding. The bar H' has interposed between it and the shaft F a cushion, e, and said bar is firmly secured to  
 15 said shaft by suitable bolts. The eccentrics J are provided with knobs f'', by which said eccentrics may be revolved to clamp or release the knife. The bar H' has on its face a metallic bearing-strip, k', for the knife, said strip  
 20 being about twice the length of the knife-blade, double wedge-shaped, and thickest in the middle. The outer surface of this plate is oblique laterally in a degree equal to the difference between the edge and back of the or-  
 25 dinary knife-blade. The purpose of the form of this plate, as described, is to offer opposite and perfect bearings to the blade of a knife on one or when reversed to the opposite of said wedge-shaped bearings, so that when the  
 30 knife is pressed upon the grinding-surface it will be normal to the same. It may be further explained that when one surface or side of the knife-blade is finished the knife is released from one of the spring-clamps, turned end for  
 35 end, and clamped upon the opposite side of the said bearing-plate.

The shaft F is capable of a movement axially the full length of a knife-blade on either side, so as to allow the said knife to be freely  
 40 moved over the stone its full length. In actual practice it is my purpose to use stones of different thicknesses, so as to be in accord with different lengths of blades, in order that said blades in their entire length may be ground at  
 45 once and not require the sliding of them laterally.

To steady and control the action of the shaft F in bearing the blades onto the stone, I place near the top, on each of the posts D sustaining  
 50 the shaft F, a box, L, set longitudinally with the machine, containing two spiral springs, ll, the tension of which may be regulated, if necessary, by some ordinary means, and on the  
 55 outsides of this box is a divided cover, m m', each part of which has a sliding movement. Pins n n project out of said box and serve as contact-points for arm g, secured to the shaft F. While the shaft F is being manipulated  
 60 said arms g contact with said pins n n, which, together with the springs l, tend to throw said arms and shaft back to normal position, thus assisting to steady the movement of the knives with reference to the surface of the stone.

To assist in holding the knife being ground  
 65 up from the stone after it has been turned up for observation, I use a weight, u, on the end of the shaft F, said weight being so placed

that when the plate H' is up the weight will be down. This weight need not be very heavy, but sufficiently so to keep the plate up while  
 70 the knife is being reversed on its bed.

It is an important matter in this machine that the action of the levers B C, operated by the feet of the operator, are capable of inde-  
 75 pendent action, thus allowing of a variable pressure from heel to point on every part of the blade on the stone, according to the desire of the operator.

By means of the handles G it is obvious that the shaft F may be turned at arbitrary  
 80 intervals by the grinder or operator in order that he may observe the effect of the stone upon the knife.

I make no special mention of the grind-stone used with this machine, as it is of the  
 85 ordinary form fixed upon a suitable shaft which is journaled in the frame of the machine in the usual manner, and provided with pulleys or suitable gear-wheels communicating  
 90 with the power.

In order to facilitate a ready return of the shaft F to normal position, I employ a weight, t, which I fix adjustably upon the outer end of the lever-arm B. By means of the opening S the movement to the knife-holding shaft may  
 95 be rendered easy, yielding, and without shock.

I claim—

1. In a machine for grinding cutlery, the saddle having bars for holding and adjusting the seat and slotted bars for regulating the  
 100 height of the foot-rests, as and for the purpose specified.

2. The combination, with the operating-levers, composed each of two parts linked together and pivoted to a suitable base, as described,  
 105 of treadles provided with shanks adjustably pivoted to the ends of arms B and movable in suitable guides, springs secured to the ends b<sup>c</sup> of the said levers B and some fixed parts of the  
 110 said base, the slotted bars E, pivoted to the arms C, vertically-movable posts D, and shaft F, carrying the knife to be ground, connected to posts D, as and for the purpose set forth.

3. The combination, with the knife-carrying shaft, of the vertically-movable posts, collars  
 115 H, connected to said posts and collars F, and bearings I, which rest in said collars and encircle said knife-carrying shaft, as and for the purpose set forth.

4. The combination, with the knife-holding  
 120 shaft provided with arms g, of the box L, the sliding cover m m', guided in said box and provided with pins n n, and buffer-springs l l, forming means for returning said arms toward normal position, as and for the purpose set  
 125 forth.

5. The combination, with the knife-carrying shaft, of a bed having a double-inclined plane, properly secured, serving as a bearing for the knife, and a suitable elastic interposed sub-  
 130 stance between said shaft and said inclined bed, as set forth.

6. The combination, with the knife-carrying shaft and the knife-bed, of springs k, secured



to said bed, and eccentric-rollers *f*, pivoted in suitable bearings secured to said knife-bed, whereby the knife to be ground is firmly clamped to place, as set forth.

- 5 7. A bed or bearing for a knife to be ground, composed of a solid base and a face formed thereon, of two opposite inclined longitudinal surfaces, the highest point of which is in the middle, so that the knife to be ground may  
10 be adjusted on either plane when reversed end

for end, in order that both sides may be equally well treated in the operation of grinding.

8. The combination, with the bed-plate provided with inclined surfaces, as described, of clamping-springs *k* and eccentric-rollers *f*, as 15 and for the purpose set forth.

HENRY A. AXTELL.

Witnesses:

RICHARD N. OAKMAN, Jr.,  
D. A. HEALEY.