

(No Model.)

2 Sheets—Sheet 1.

A. R. CLIZBE.
GRINDING MACHINE.

No. 567,637.

Patented Sept. 15, 1896.

Fig. 3.

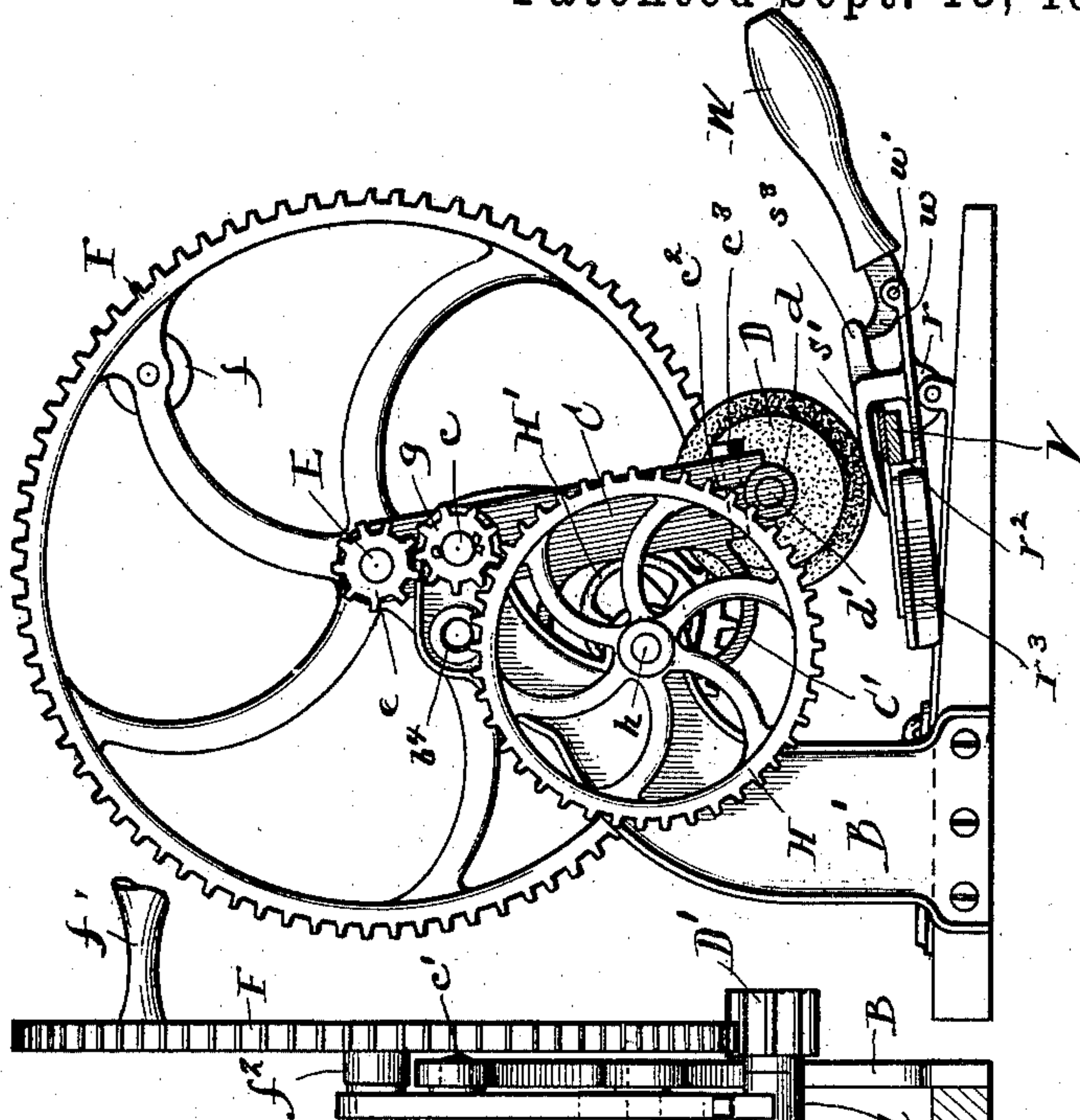


Fig. 2.

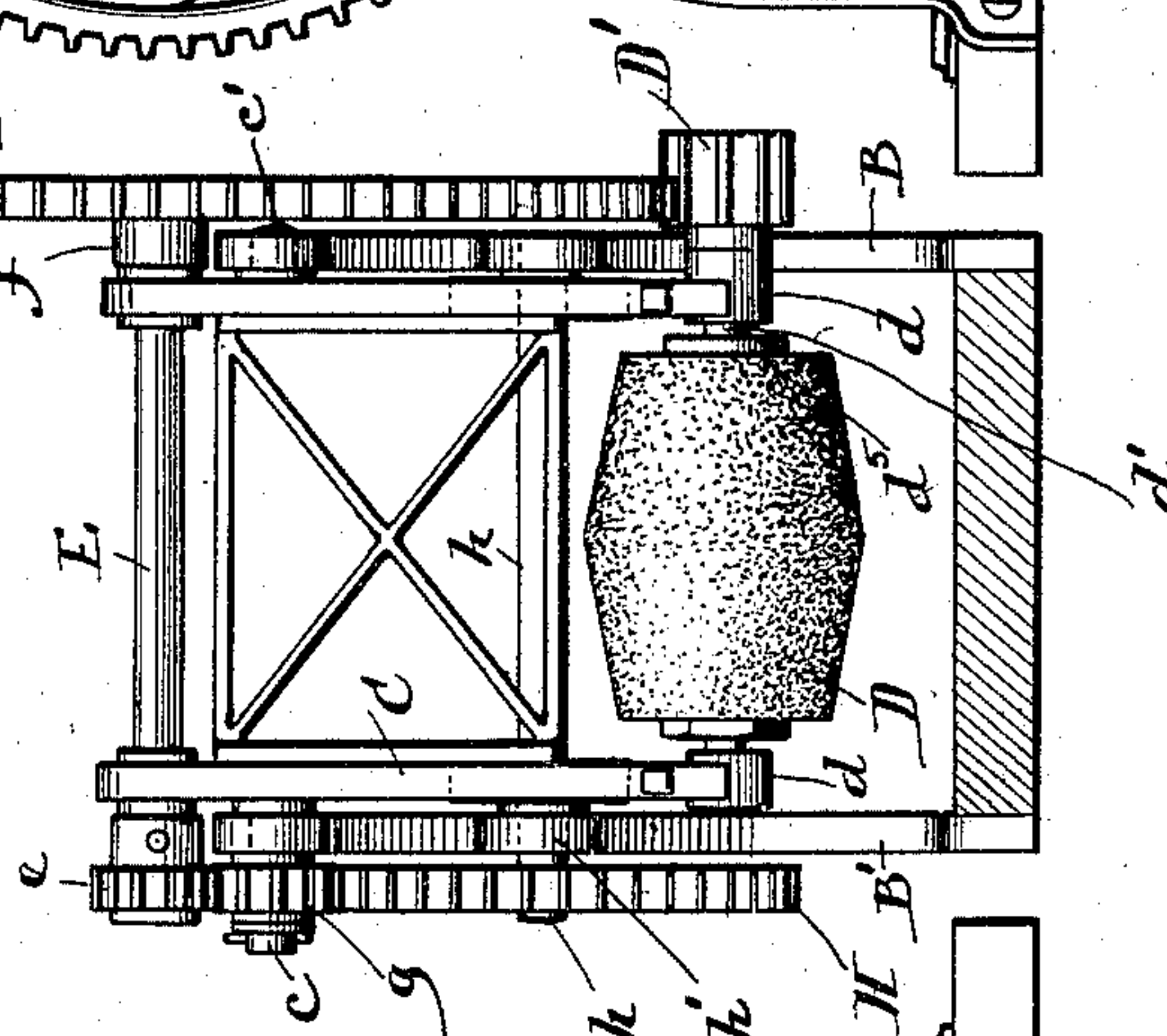
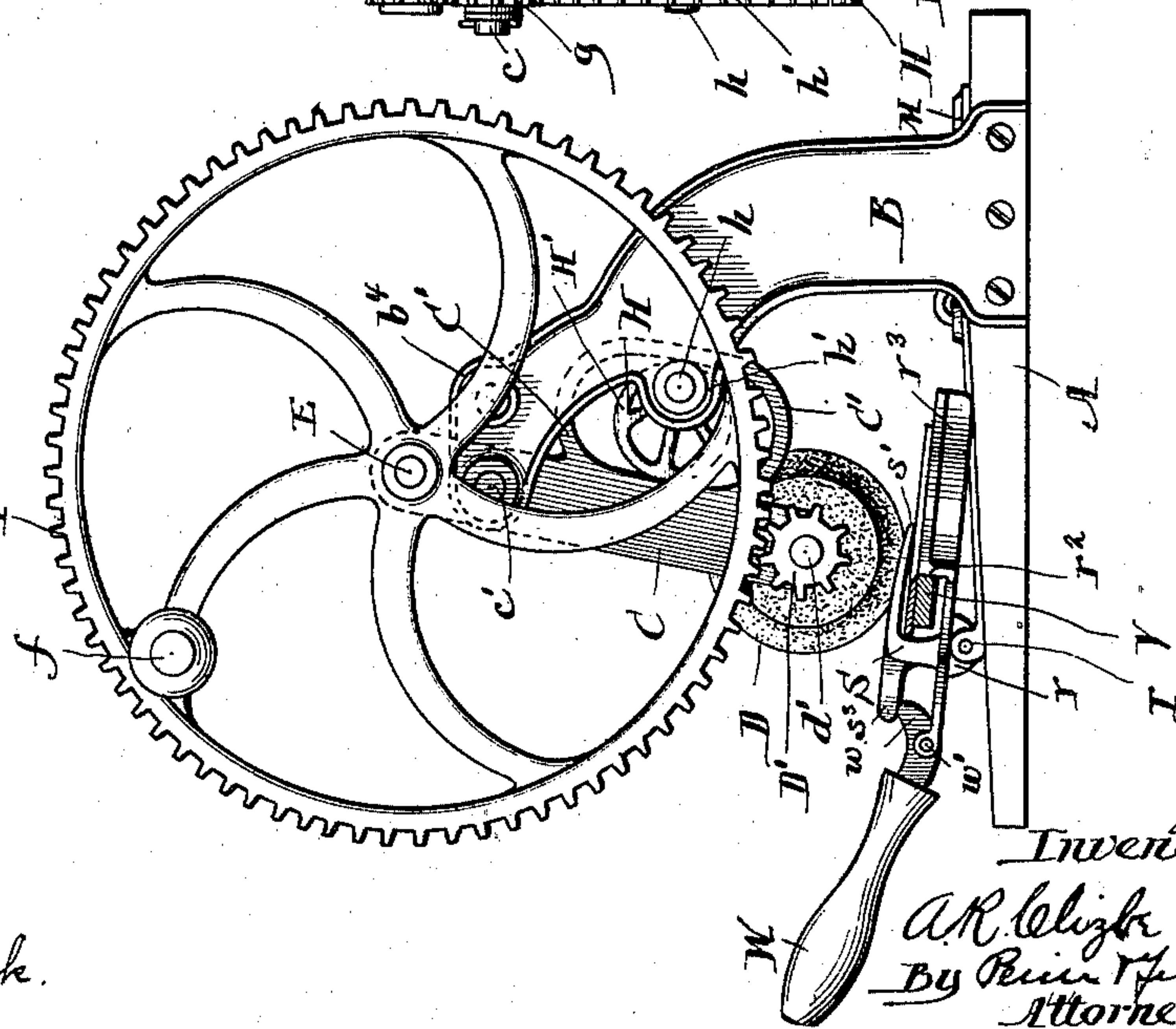


Fig. 1.



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(No Model.)

2 Sheets—Sheet 2.

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Fig. 5.

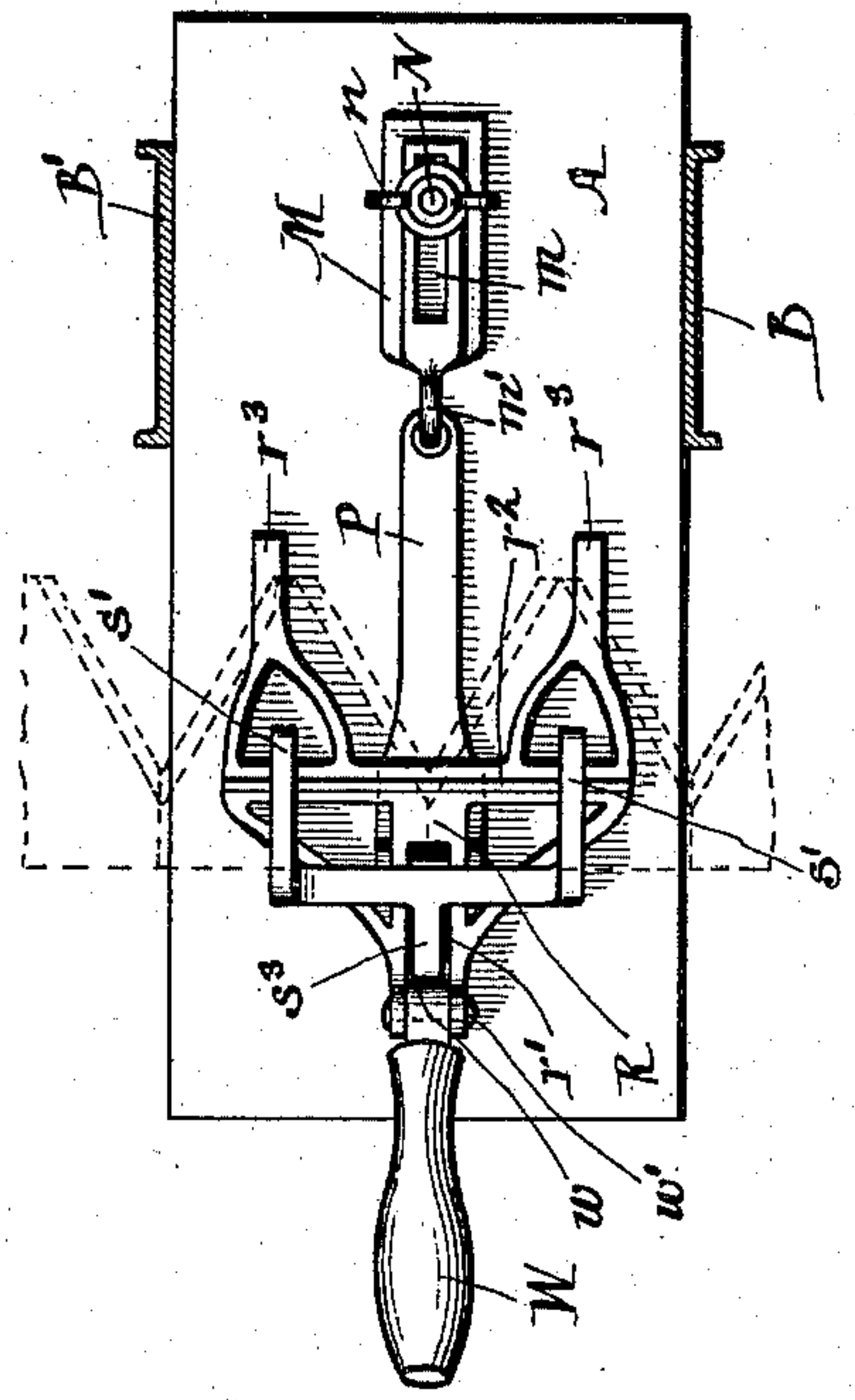


Fig. 6.

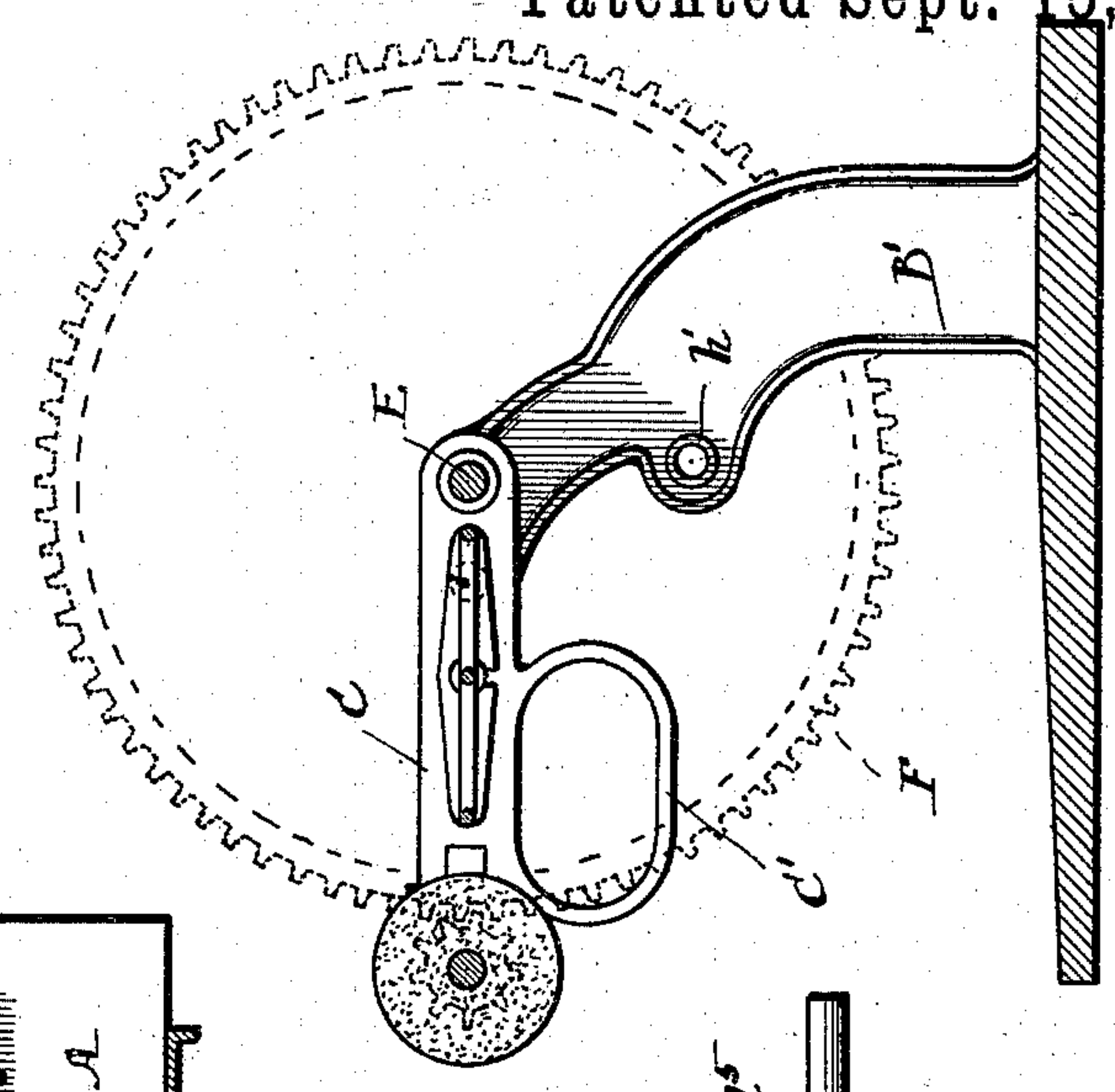


Fig. 7.

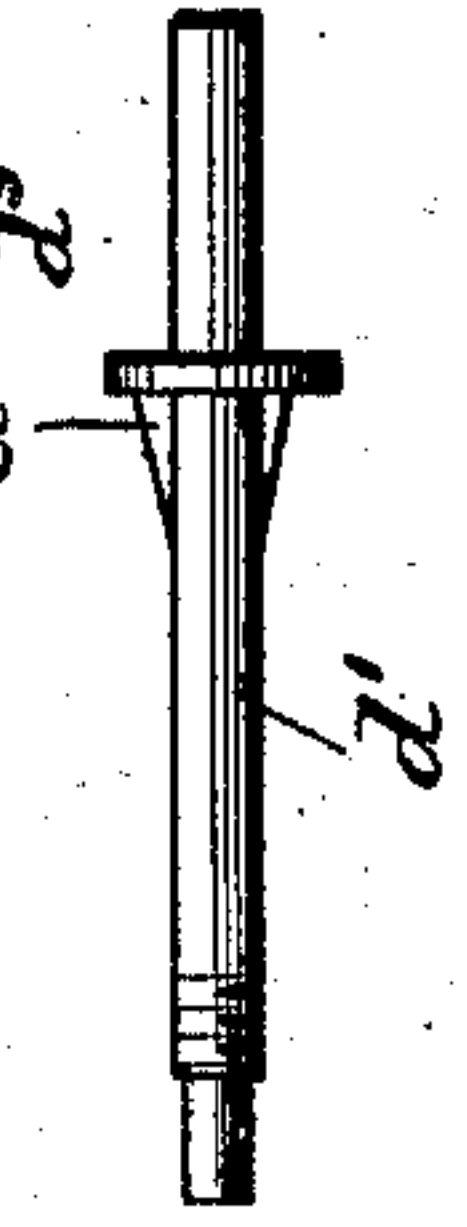
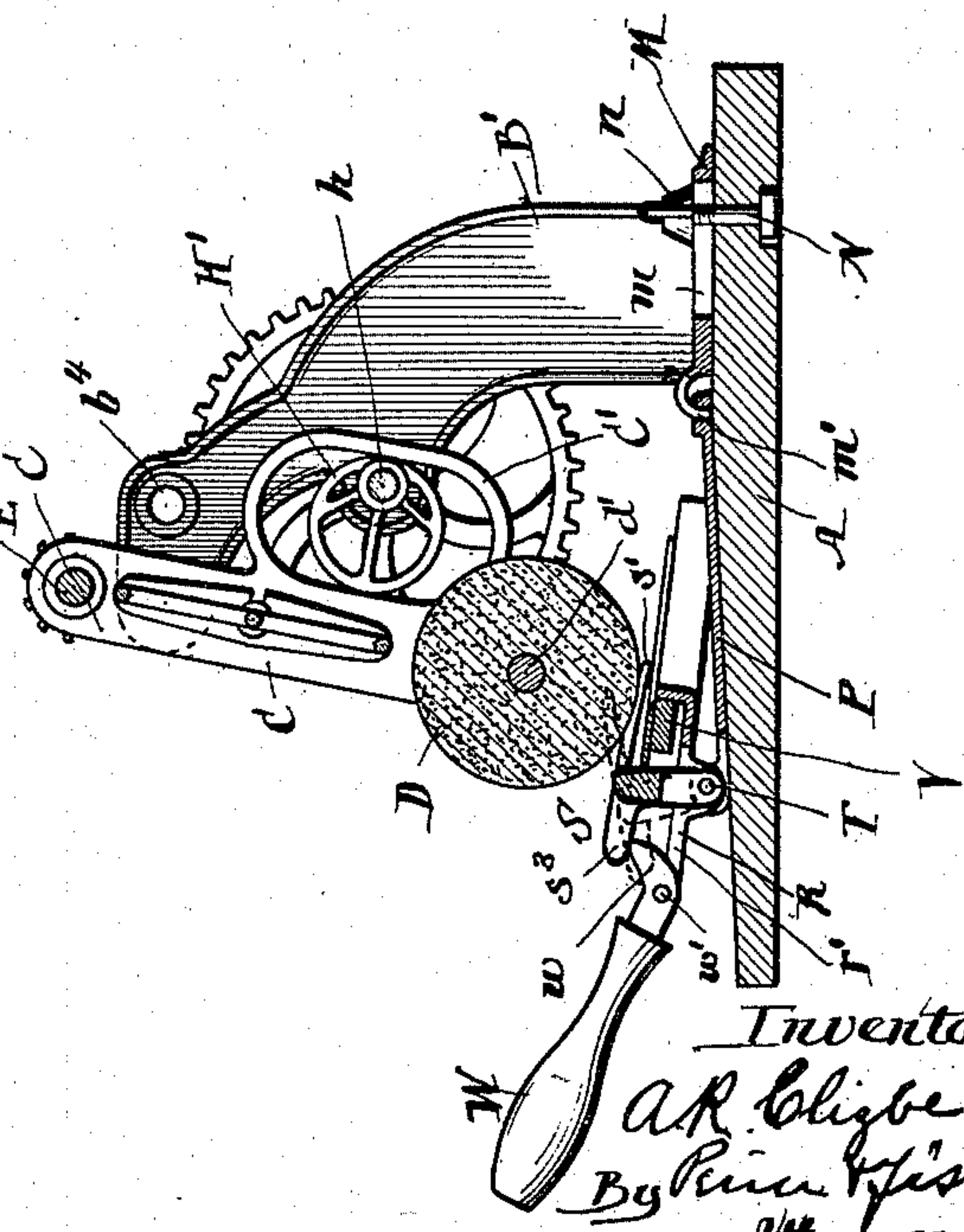


Fig. 4.



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UNITED STATES PATENT OFFICE.

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GRINDING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 567,637, dated September 15, 1896.

Application filed November 2, 1895. Serial No. 567,705. (No model.)

To all whom it may concern:

Be it known that I, ADELBERT R. CLIZBE, a citizen of the United States, and a resident of the city of Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Grinding-Machines, of which I do declare the following to be a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

The present invention has relation to that class of grinding-machines more particularly designed for the grinding of harvester-knives and the like, in which the grinding-wheel is carried upon a swinging frame adapted to be moved automatically in the direction of the length of the teeth as the wheel revolves.

The invention consists in various novel features of construction hereinafter described, illustrated in the accompanying drawings, and particularly pointed out in the several claims at the end of this specification.

Figure 1 is a view in side elevation of the machine embodying my invention. Fig. 2 is a front view, the knife-holder being omitted. Fig. 3 is a view in side elevation from the left side of the machine. Fig. 4 is a view in central vertical longitudinal section. Fig. 5 is a detail plan view of the base-board with the knife-holder thereon, other parts of the machine being omitted. Fig. 6 is a view in longitudinal section showing the position of the grinding-wheel frame when the machine is to be used as an ordinary grinding-machine. Fig. 7 is a detail view of the grinding-wheel shaft.

From the base A of the machine rise the standards B and B', between the upper ends of which is pivotally sustained the swinging frame C, that carries the grinding-wheel D. Preferably the side bars of the swinging frame C have pivot lugs or trunnions *c* and *c'* cast therewith, these lugs setting within suitable journal seats or bearings at the top of the standards B B'. In order to permit the grinding-wheel D to be readily inserted into and removed from the swinging frame C, I prefer to form the lower ends of the side bars of the swinging frame with seats *c²*, adapted to receive the shanks of the journal-bearing blocks *d*, wherein the shaft *d'* of the grinding-wheel

D will be journaled, these blocks *d* being conveniently attached to the lower ends of the side arms of the swinging frame by means of bolts *c³*. Through the upper ends of the side arms of the swinging frame C passes the main drive-shaft E, to one end of which is connected the drive-wheel F, furnished with a handle *f*, whereby it can be conveniently turned. To the opposite end of the drive-shaft E is fixed a pinion *e*, that engages with an idler-pinion *g*, that is loosely mounted upon the pivot-stud *c*, that projects sufficiently through the standard B' to receive this idler-pinion, and with the pinion *g* meshes a gear-wheel H, that is carried by the eccentric-shaft *h*, that is journaled in the bearing *h'* of the standards B B'. Upon the shaft *h* are fixed the eccentrics H', these eccentrics setting within the yokes C', that project rearwardly from the side bars of the swinging frame C. The shaft *d'*, to which the grinding-wheel D is fixed, carries at one end a drive-pinion D', that meshes with the main drive-wheel F, as clearly shown in Fig. 1. The drive-pinion D' is carried upon the swinging frame C at a distance from the center of oscillation equal to the radius of the main drive-wheel F. Consequently the wheel F and the pinion D' will be maintained in constant gear notwithstanding the swinging of the frame C.

From the construction of parts thus far defined it will be seen that as the main drive-wheel F is revolved by means of the handle *f* a back-and-forth swinging movement will be imparted to the frame C by means of the eccentrics H' engaging with the yokes C' at the back of the swinging frame C. Consequently the grinding-wheel D will be swung back and forth, while at the same time the pinion D', being in mesh with the gear-wheel F, will impart a rotary movement to the grinding-wheel D. In this class of machines it is very desirable that the swinging frame that carries the grinding-wheel should be firmly held during its back-and-forth movement, so that a uniformity of action of the grinding-wheel upon the harvester-knife may be had, and it is manifest that inasmuch as the eccentric-yokes C' are arranged at opposite ends of the swinging frames (being preferably formed in piece with the side-bars)

both sides of the swinging frame will be oscillated uniformly, and consequently a uniform back-and-forth movement will be imparted to the grinding-wheel D. In prior machines where the swinging frame has been oscillated by a connection at one side thereof it has been found that the irregularity of movement of the swinging frame has resulted in an uneven action of the grinding-wheel upon the knives; but by the employment of eccentrics a uniform movement of the swinging frame is insured.

In order to hold the harvester-knife during the grinding operation, I employ the improved construction of knife-holder next to be described. Upon the base A is mounted an adjustable block M, having a slot *m* therein, through which passes the bolt N, that passes through a hole in the base A, and is provided at its upper end with a thimble-nut *n*, whereby the position of the block M can be determined. The front end of the block M is provided with a hook *m'*, that enters a hole or seat in the end of the bar P, to the front end of which bar the knife-rest R is pivotally connected. Preferably the bar P has a yoke-shaped end between which set the lugs *r*, depending from the rest R, and through the end of this rest is formed a long slot *r'*, through which passes the shank *s* of the clamp-bar S. A pivot-pin T passes through the arms at the end of the bar P, and through the lugs *r*, depending from the rest R, and through the shank *s* of the clamp-bar S, the same pivot-pin thus serving to unite the several parts. The rest-plate R is formed with an upwardly-extending shoulder or angular portion *r²*, against which will bear the chafing-bar *v* of the harvester-knife V, and from the angular portion *r²* of the rest-plate extend the arms *r³*, that will rest upon the base A, these arms being separated a sufficient distance to afford proper bearings for the teeth of the harvester-knife, as seen in Fig. 5. The clamp-bar S has forwardly-projecting blocks *s'* adapted to bear against and firmly hold the harvester-knife on the arms *r³* of the rest-plate R, and at the rear of the clamp-bar S is formed a lug *s³*, against which will bear the upturned shank *w* of the clamp-handle W, the shank of this handle W being pivoted, as at *w'*, between the forwardly-projecting arms *r³* of the rest-plate R. The forwardly-projecting lug *s³* is of such size that the clamp-bar S may be turned upwardly so as to permit the harvester-knife to be inserted in place under the clamp-fingers *s'*. By this means the harvester-knife can be quickly placed within the holder, and the necessity of sliding the knife endwise into the holder is avoided.

From the foregoing description it will be seen that when a harvester-knife is to be ground the clamp-bar S and handle W will be turned, after which the harvester-knife will be inserted in place with the chafing-bar V resting against the angular bar *r²* of the rest-plate

R. The handle W will then be turned downward and forward, as shown by Fig. 3, thereby causing the clamp-bar S to be turned about its pivot-point until the fingers *s'* bear firmly against the harvester-knife. Inasmuch as the rest-plate R is mounted in manner free to turn about the pivot-point T, it is obvious that the rest-plate can be tipped more or less as the grinding-wheel swings forward and backward and is at all times within easy control of the operator. The adjusting-block M enables the knife-holder to be set in proper position for the grinding of any size of knife.

When it is desired to use the machine as an ordinary grinding-machine, a cylindrical wheel may be substituted for the wheel D, and in order to bring this wheel into more convenient position the shaft E will be removed from the journal-bearings at the top of the swinging frame. The eccentric-shaft *h*, the eccentrics *H'*, and the gear-wheel H and pinion *g* will be removed and the swinging frame will be turned about the trunnions *c c'* to the position seen in Fig. 6 of the drawings, after which the shaft E will be passed through the supplemental bearing-seats *b⁴* at the top of the standards B B' and through the bearing-seats at the upper end of the swinging frame, thereby holding the swinging frame in horizontal position. The main drive-wheel F will still be in gear with the drive-pinion D', this pinion being made somewhat broad in order to mesh with the gear-wheel F when the hub *f²* of this wheel is brought outside the standard B, as shown in Fig. 6. With the swinging frame thus turned to horizontal position and rigidly held the grinding-wheel will be driven from the main drive-wheel F and the machine can be used for ordinary grinding purposes.

The shaft *d'*, on which the grinding-wheel D is mounted, is preferably of the construction shown in Fig. 7 of the drawings—that is to say, the shaft has plain portions at its ends to set within the bearing *d* and is provided with a collar *d⁵*, from which extend webs or lugs *d⁶*, that enter seats formed in the bore of the grinding-wheel and hold it securely upon the shaft. The opposite end of the shaft *d'* is formed with a threaded portion to receive the usual retaining-nut.

It is manifest that the exact details of construction above set out may be varied by the skilled mechanic without departing from the spirit of the invention and that features of the invention may be employed without its adoption as an entirety.

Having thus described the invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a grinding-machine, the combination with the main standards, and with the wheel-carrying frame pivoted thereto, of a shaft journaled in said standards, and provided with an eccentric, said wheel-carrying frame being provided with a bearing-yoke for engaging said eccentric, a main drive-shaft and gearing intermediate said first-mentioned

shaft and said drive-shaft, substantially as described.

2. In a grinding-machine, the combination with the main standards and with the wheel-carrying frame pivoted thereto, of a shaft journaled in said main standards and provided with two eccentrics, yokes at each side of the swinging frame engaging said eccentrics, a train or gear for driving said shaft, a grinding-wheel mounted in said swinging frame, a pinion on the shaft of said grinding-wheel and a main drive-shaft having a pinion at one end in gear with said first-mentioned shaft and having a gear-wheel at its opposite end meshing with the pinion on the grinding-wheel, substantially as described.

3. In a grinding-machine, the combination with the main standards having a supplemental set of journal-bearings, a swinging frame pivoted to said standards, said swinging frame being provided with bearings for a drive-shaft arranged at the same distance from the pivot-bearings of the swinging frame as are the supplemental bearings of the standards, whereby said main drive-shaft may be passed through both the bearings at the back of the swinging frame and the supplemental bearings of the main standards, substantially as described.

4. In a grinding-machine, a knife-holder comprising an adjustable bar, a rest-plate pivoted to the forward end of said adjustable

bar and suitable means whereby a knife may be held upon said rest-plate, substantially as described.

5. In a grinding-machine, a knife-holder comprising a rest-plate for sustaining a knife to be ground, a pivoted clamp-bar for engaging said knife and a handle provided to the rest-plate whereby said clamp-bar is operated and whereby said rest-plate can be manipulated, substantially as described.

6. In a grinding-machine, a knife-holder comprising a rest-plate pivoted to turn in vertical direction and provided at its front with a handle, a clamp-bar for holding the knife in position upon said rest-plate, said clamp-bar having fingers adapted to extend over the knife-teeth and having a part extending into position to be engaged by the handle, substantially as described.

7. In a grinding-machine, a knife-holder comprising a rest-plate pivoted to swing in vertical direction, a handle at the front of said rest-plate and whereby it may be manipulated, a pivoted clamp-plate having a part adapted to be engaged by said handle and having fingers adapted to clamp the knife against the rest-plate, substantially as described.

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