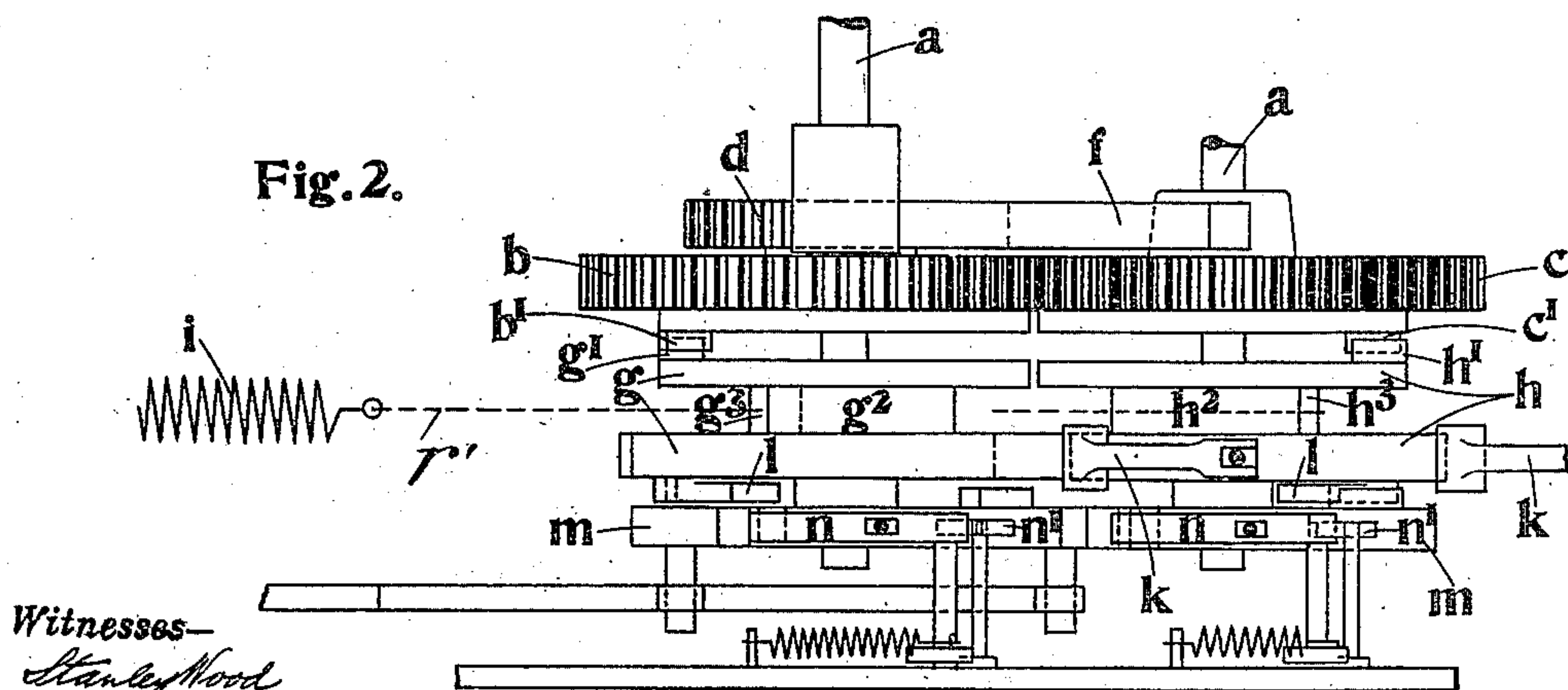
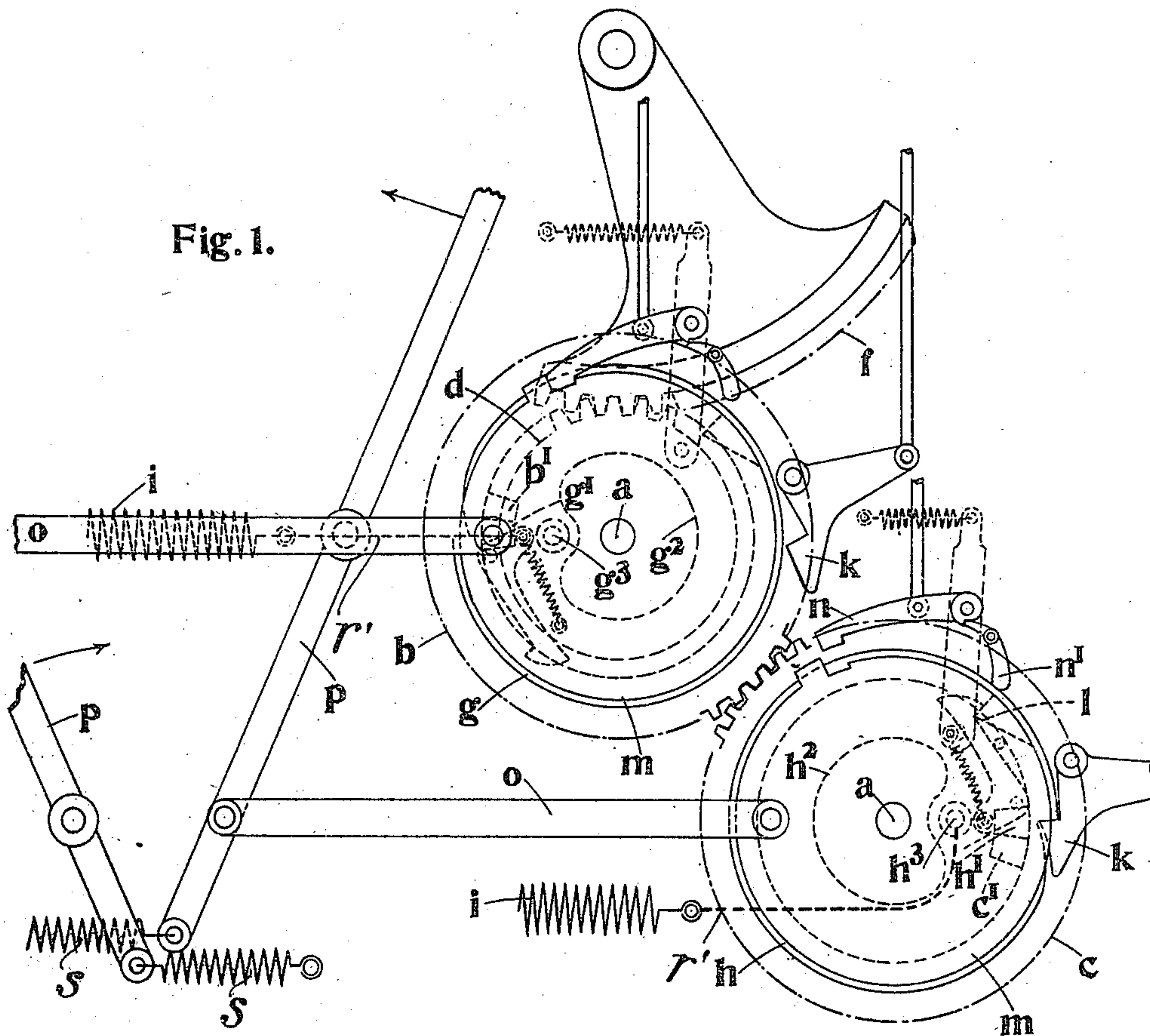


O. HALLENSLEBEN.  
 SPRING SHUTTLE BEATER FOR POWER LOOMS.  
 APPLICATION FILED AUG. 13, 1910.

987,623.

Patented Mar. 21, 1911.

3 SHEETS-SHEET 1.



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Fig. 3.

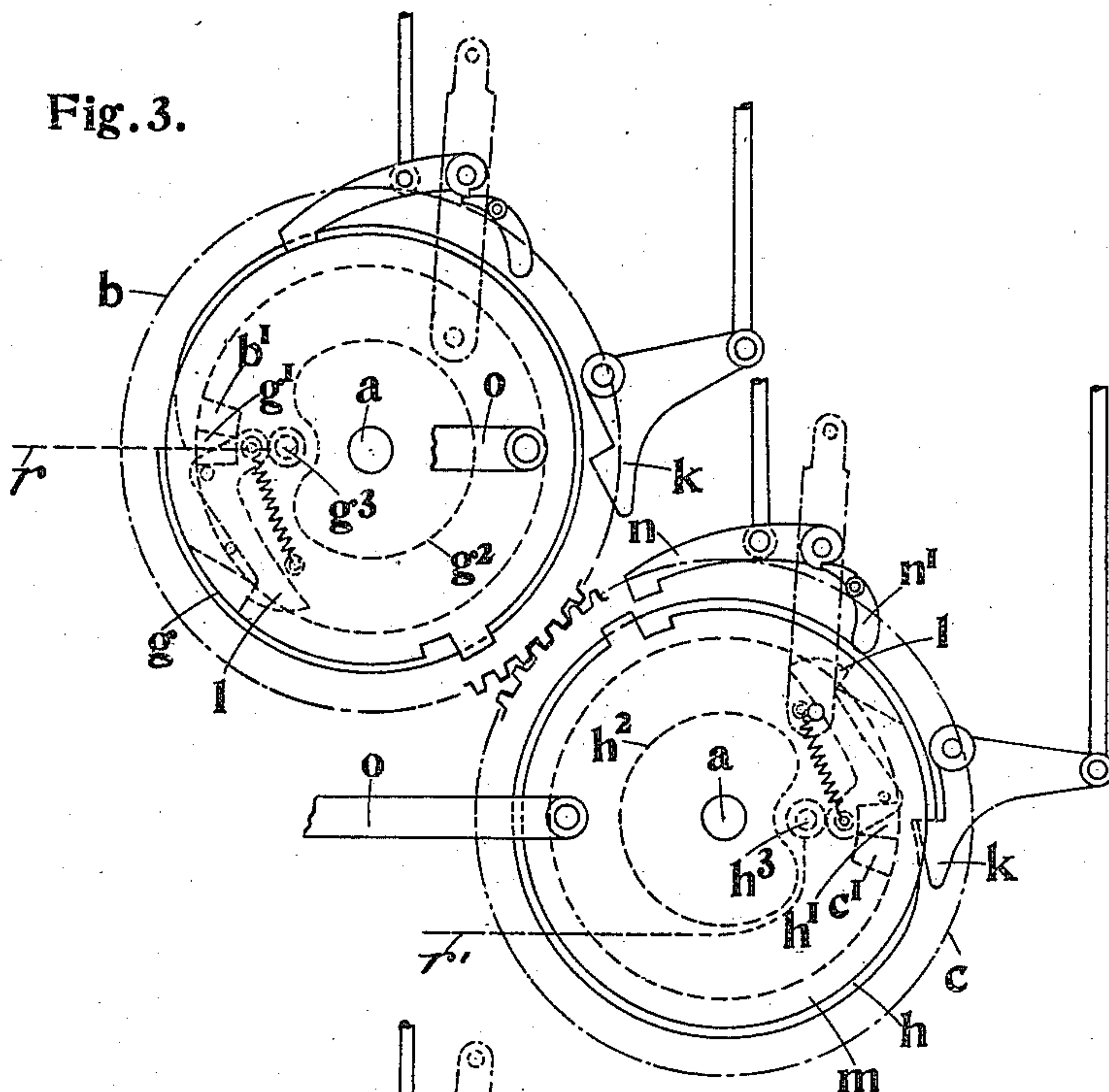
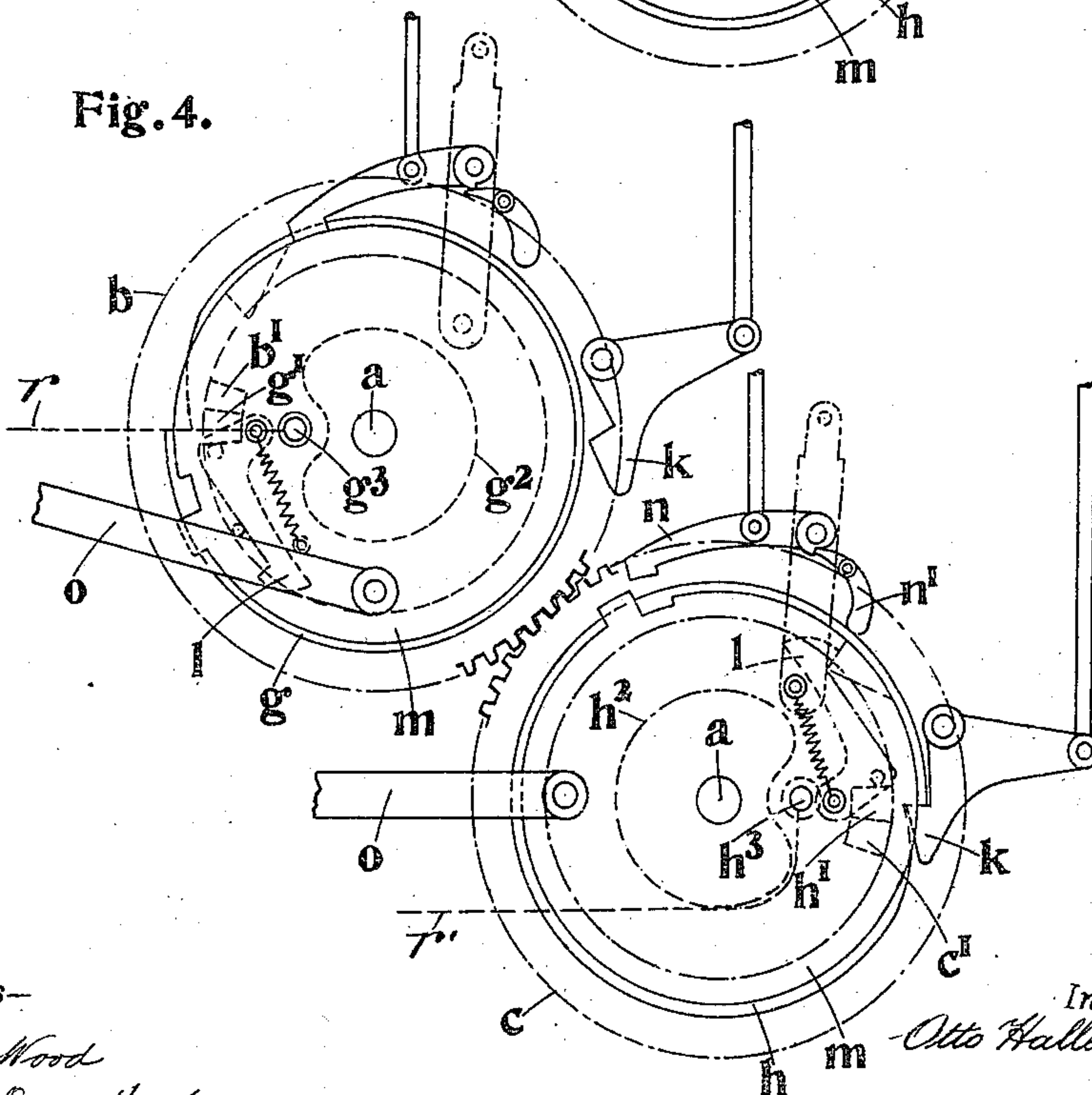


Fig. 4.



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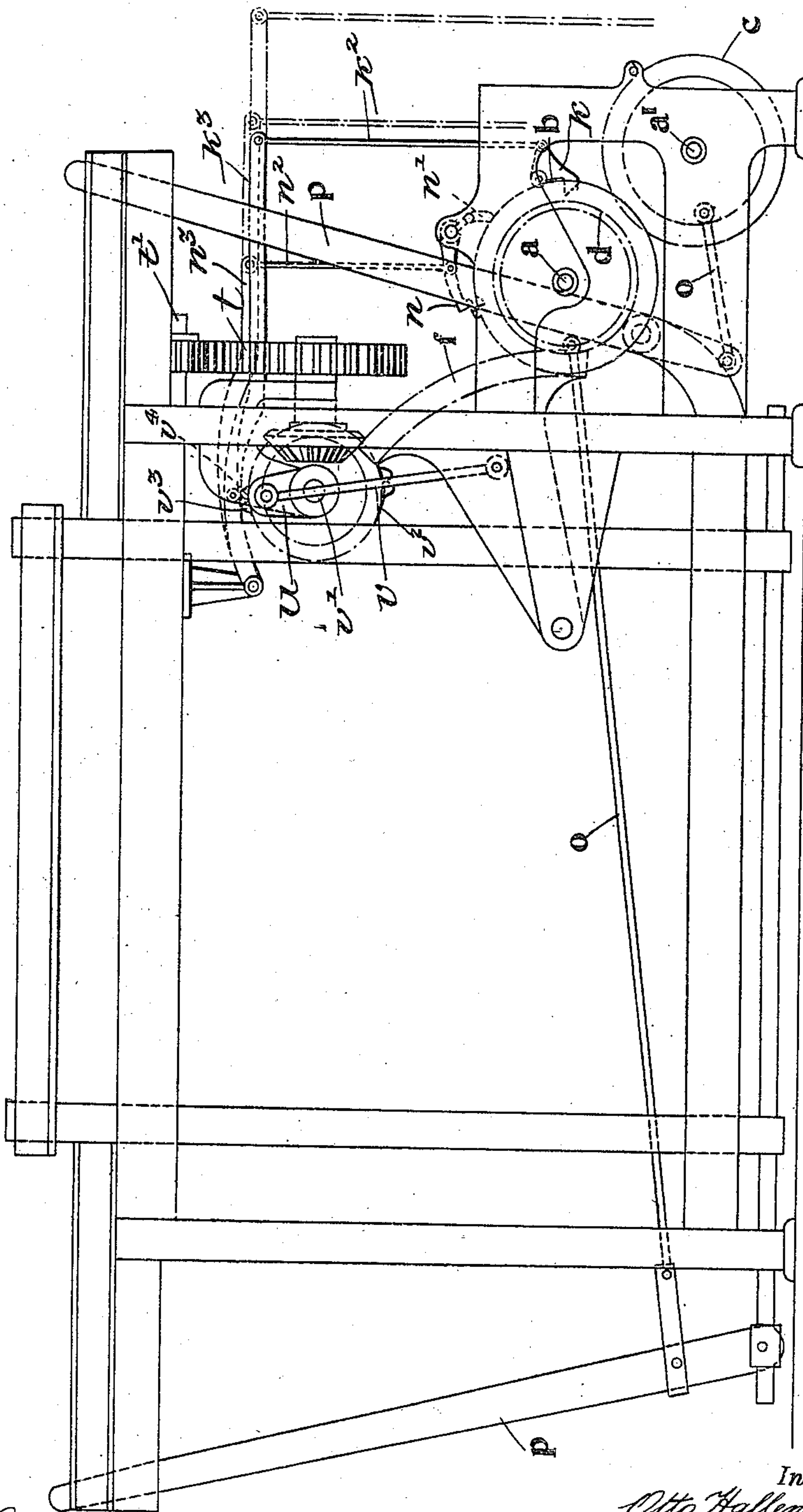
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Fig. 5.



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# UNITED STATES PATENT OFFICE.

OTTO HALLENSLEBEN, OF GÖRLITZ, GERMANY.

SPRING-SHUTTLE BEATER FOR POWER-LOOMS.

987,623.

Specification of Letters Patent.

Patented Mar. 21, 1911.

Application filed August 13, 1910. Serial No. 577,037.

*To all whom it may concern:*

Be it known that I, OTTO HALLENSLEBEN, a subject of the German Emperor, residing at 7 Hilgerstrasse, Görlitz, Germany, have invented a certain new and useful Spring-Shuttle Beater for Power-Looms, of which the following is a specification.

The operation of the shuttle by means of a previously tensioned spring has the great advantage that during slow and rapid operation of the loom the shuttle is continuously picked with the same force. In order, however, that the loom may operate at the required speed, devices must be provided to withdraw the shuttle driver after striking from the shuttle box.

This invention relates to a device for immediately withdrawing the shuttle driver after each stroke. This is effected in such manner that the picking spring, by the rotation of a suitable disk, is tensioned and the disk then locked. On the release of the disk which was previously rotated to tension the spring and on its return movement, due to the action of the tensioned spring, the disk rotates with it a second disk connected to the beating up mechanism by means of a free wheel coupling. In this manner on the retardation of the disk, connected to the picking spring, by the spring, the disk connected to the picking up mechanism is, in consequence of the momentum imparted thereto, moved beyond the picking up position whereupon on the completion of the revolution it is retained in the required position for the next operation by a pawl or the like. The simplest method of constructing such a shuttle picker device is to provide a disk which can be rotated into the required position by the mechanism of the loom and released by a pawl, which disk winds up a member connected to the picking-up spring and on its release by a pawl rotates a second disk which is connected to the picking-up mechanism and after a complete revolution is locked by a pawl which is adapted to be released by the mechanism of the loom.

In the accompanying drawing is illustrated a constructional form of the new shuttle beating device of which one disk operates one picker staff and the other disk, the other.

Figure 1 is a side elevation. Fig. 2 is

a plan. Figs. 3 and 4 show a part of the picking mechanism in two positions which occur during the operation. Fig. 5 shows diagrammatically the application of the shuttle picking device to a loom. This only shows a particular example of the application of the invention, as this naturally can be applied in any other suitable manner.

On the shafts  $a$ ,  $a^1$  are rotatably mounted toothed wheels  $b$  and  $c$ , and a toothed wheel  $d$  secured to the wheel  $b$  engages with a segment  $f$  oscillated by the mechanism  $t$  driven from the crank shaft  $t^1$  of the loom through the medium of the crank  $u$  and the connecting rod  $v$ . The two toothed wheels  $b$  and  $c$  are in engagement with one another so that the movement imparted to the toothed wheel  $b$  by the sector  $f$  is transmitted to the wheel  $c$ . The toothed wheels  $b$  and  $c$  are provided with projections  $b^1$  and  $c^1$  which cooperate with projections  $g^1$  and  $h^1$  provided on disks  $g$  and  $h$ , one for each picker staff  $p$ , rotatably mounted on the shafts  $a$ ,  $a^1$  so that on the rotation of the wheels  $b$  and  $c$  in one direction the disks  $g$  and  $h$  are also rotated. The disks  $g$  and  $h$  are provided with cams  $g^2$  and  $h^2$  adapted to tension springs  $i$  by means of chains  $r$  secured to pins  $g^3$  and  $h^3$  carried by disks  $g$  and  $h$  and to the picking-up springs  $i$ ; the said chains being wound on the respective cams on the rotation of the disks  $g$  and  $h$ . By winding the chains on the cams  $g^2$  and  $h^2$  the springs  $i$  are tensioned. After the disk  $h$  (in Fig. 1) has been rotated through half a revolution for tensioning the springs, one of the pawls  $k$  engages the projection on the disk, so that the disk is prevented from being rotated by the spring  $i$ . After the spring  $i$  has been tensioned in the manner hereinbefore described the pawl  $k$  is released by suitable mechanism operated by the mechanism of the loom at the moment that the picking-up is to be effected. The disk  $h$  when released, is then rotated in the opposite direction by the spring  $i$ .

When the disk  $h$  is in the position shown in Fig. 1 that is in the position in which the picking-up spring  $i$  is tensioned, the disk  $h$  by means of a pawl  $l$  engages with a projection provided on a disk  $m$  rotatably mounted on the shaft  $a^1$ . By means of pawl  $n$  which engages with a projection on the



disk *m* the latter is held in the position shown in Fig. 1. In this figure the pawl is shown in the raised position whereas the disk *m* is still in the locked position. The  
 5 pawls *n* and *n*<sup>1</sup> are, of course, mounted on the frame of the machine in the customary way, as shown in Fig. 5.

On the shaft *v*<sup>1</sup>, which is rotated from the crank shaft *t*<sup>1</sup> of the loom by the toothed  
 10 wheels *t* and the bevel wheels *t*<sup>2</sup> are mounted disks *v*<sup>2</sup> provided with projections *v*<sup>3</sup> and *v*<sup>4</sup>. These projections respectively operate upon pivoted levers *n*<sup>3</sup> and *k*<sup>3</sup> respectively connected to the pawls *n* and *k* by the members  
 15 *n*<sup>2</sup> and *k*<sup>2</sup>. The pawls *k* and *n* are mounted on the main frame of the machine.

It will be understood that a second set of disks *v*<sup>2</sup> is mounted upon the shaft *v*<sup>1</sup> for operating through the medium of the similar  
 20 mechanism the corresponding pawls controlling the mechanism on the shaft *a*<sup>1</sup>.

For releasing the picking-up mechanism the pawl *k* is raised simultaneously or almost simultaneously with the pawl *n* where-  
 25 upon an auxiliary pawl *n*<sup>1</sup> comes under the latter and retains it in the disengaged position (Fig. 1). On releasing the pawl *k* the picking-up is effected and the disk *h* rotates by means of its pawl *l* the disk *m*. In this  
 30 manner the outwardly directed projection of the disk *m* abuts against the downwardly directed part of the auxiliary pawl *n*<sup>1</sup> and puts this out of engagement, so that the pawl *n* comes into contact with the periphery  
 35 of the disk *m* (Fig. 3).

By reason of the pulling action of the spring *i* the disk *h*, by means of the pawl *l*, rotates the disk *m*, which is connected by means of the arms *o* to the picking-up arm  
 40 *p*, into the position shown in Fig. 3. In this position the disk *h* is retarded by means of the spring *i* which latter on further rotation of the disk *h* would be again tensioned. The disk *m*, however, as its projection is re-  
 45 leased from the disk *h*, rotates further in consequence of its momentum, assisted by the spring *s* of the picking-up arm *p* (Fig. 1) so that the picking-up arm *p* is again drawn back by the rod *o*. The rotation of  
 50 the disk *m* is limited by the pawl *n* resting on the periphery of the said disk *m*, which pawl retains the disk *m* in the position shown in Fig. 1, and on rotating the disk *h* for the purpose of tensioning the spring *i*,  
 55 the pawl *l* of the disk *h* moves over the inwardly turned projection of the disk *m* and engages behind this projection. The device is then in the necessary position for the next beating-up operation.

60 The arrangement of the two toothed wheels *b* and *c* is applicable to looms which regularly and alternately beat up right and left. The devices coöperating with the wheel *b* are exactly the same as those here-  
 65 inbefore described coöperating with the

toothed wheel *c*. During two revolutions of the batten there is a single oscillation of the segment *f*, whereby the movement to the left tensions, when the one to the right effects the picking-up and vice versa.

What I claim as my invention and desire to secure by Letters Patent is:—

1. A spring shuttle picker device comprising a toothed sector, a toothed wheel in engagement with said sector, a second  
 75 toothed wheel secured to the first toothed wheel, a third toothed wheel gearing with the second toothed wheel, cam mechanisms adapted to be operated intermittently by said toothed wheels, picker arms, and means  
 80 adapted to operably connect the cams to the picker arms, and means for rotating the cam mechanisms in opposite directions to those produced by the sector.

2. A spring shuttle beater device compris-  
 85 ing two shafts, two toothed wheels secured to one shaft, a toothed wheel secured to the other shaft, a toothed sector, one of the toothed wheels on one shaft gearing with the toothed wheel on the other shaft, the sec-  
 90 ond toothed wheel on the first shaft gearing with the toothed sector, cam mechanisms adapted to be operated by the toothed wheels, means for retaining the cam mechanisms in the inoperative position, means for  
 95 releasing the cam mechanism, picker arms, and means operably connecting the cam mechanisms to the picker rods, and means for rotating the cam mechanisms in opposite directions to those produced by the sector.

3. A spring shuttle beater device comprising two shafts, two toothed wheels secured to one shaft, a toothed wheel secured to the other shaft, a toothed sector, one of the toothed  
 105 wheels on the first shaft gearing with the toothed wheel on the second shaft, the second toothed wheel on the first shaft gearing with the toothed sector, cam mechanisms, means for intermittently connecting said cam mechanisms to the interengaging toothed  
 110 wheels, means for retaining the cam mechanisms in the inoperative position, means for releasing the cam mechanisms, picker arms, means for operably connecting the cam mechanisms to the picker arms, and means  
 115 for rotating the cam mechanisms in opposite directions to those produced by the sector.

4. A spring shuttle beater device comprising two shafts, two toothed wheels secured to one shaft, a toothed wheel secured to the  
 120 other shaft, a toothed sector, one of the toothed wheels on the first shaft gearing with the toothed wheel on the second shaft, the second toothed wheel on the first shaft gearing with the toothed sector, cam mecha-  
 125 nisms, means for intermittently connecting said cam mechanisms to the interengaging toothed wheels, consisting of projections on the interengaging toothed wheels and the cam mechanisms, means for retaining the



cam mechanisms in the inoperative position, means for releasing the cam mechanisms, picker arms, means for operably connecting the cam mechanisms to the picker arms, and  
5 means for rotating the cam mechanisms in opposite directions to those produced by the sector.

5. A spring shuttle beater device comprising two shafts, two toothed wheels secured  
10 to one shaft, a toothed wheel secured to the other shaft, a toothed sector, one of the toothed wheels on the first shaft gearing with the toothed wheel on the second shaft, the second toothed wheel on the first shaft  
15 gearing with the toothed sector, cam mechanisms, means for intermittently connecting

said cam mechanisms to the interengaging toothed wheels, means for retaining the cam mechanisms in the inoperative position, and for preventing said cam mechanisms 20 from being rotated through more than one revolution in one direction, means for releasing the cam mechanisms, picker arms, and means for operably connecting the cam mechanisms to the picker arms, and means 25 for rotating the cam mechanisms in opposite directions to those produced by the sector.

OTTO HALLENSLEBEN.

Witnesses:

JEAN GRUND,  
CARL GRUND.

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."

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