

No. 667,569.

Patented Feb. 5, 1901.

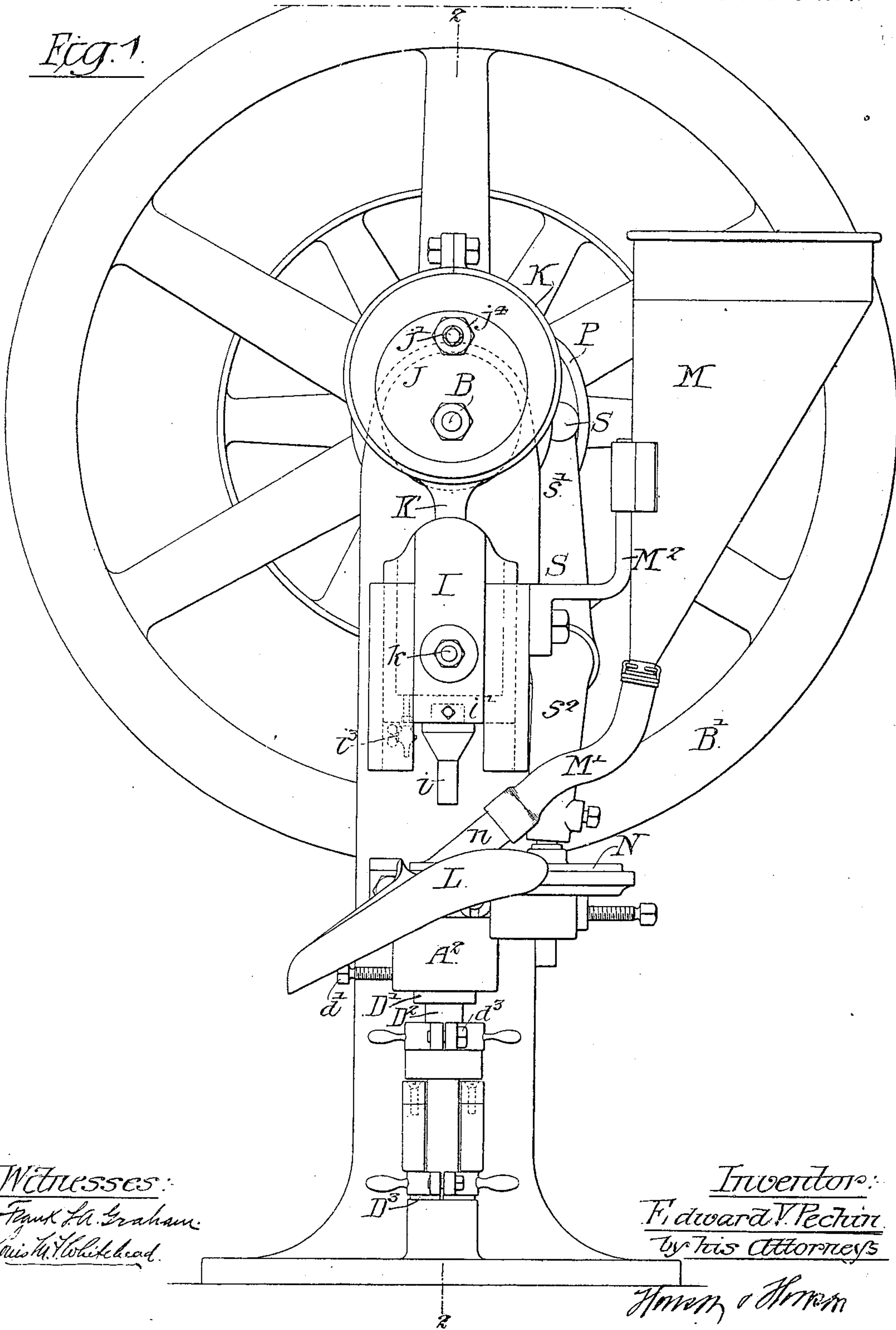
E. V. PECHIN.
TABLET MAKING MACHINE.

(Application filed Dec. 7, 1899.)

(No Model.)

4 Sheets—Sheet 1.

Fig. 1.



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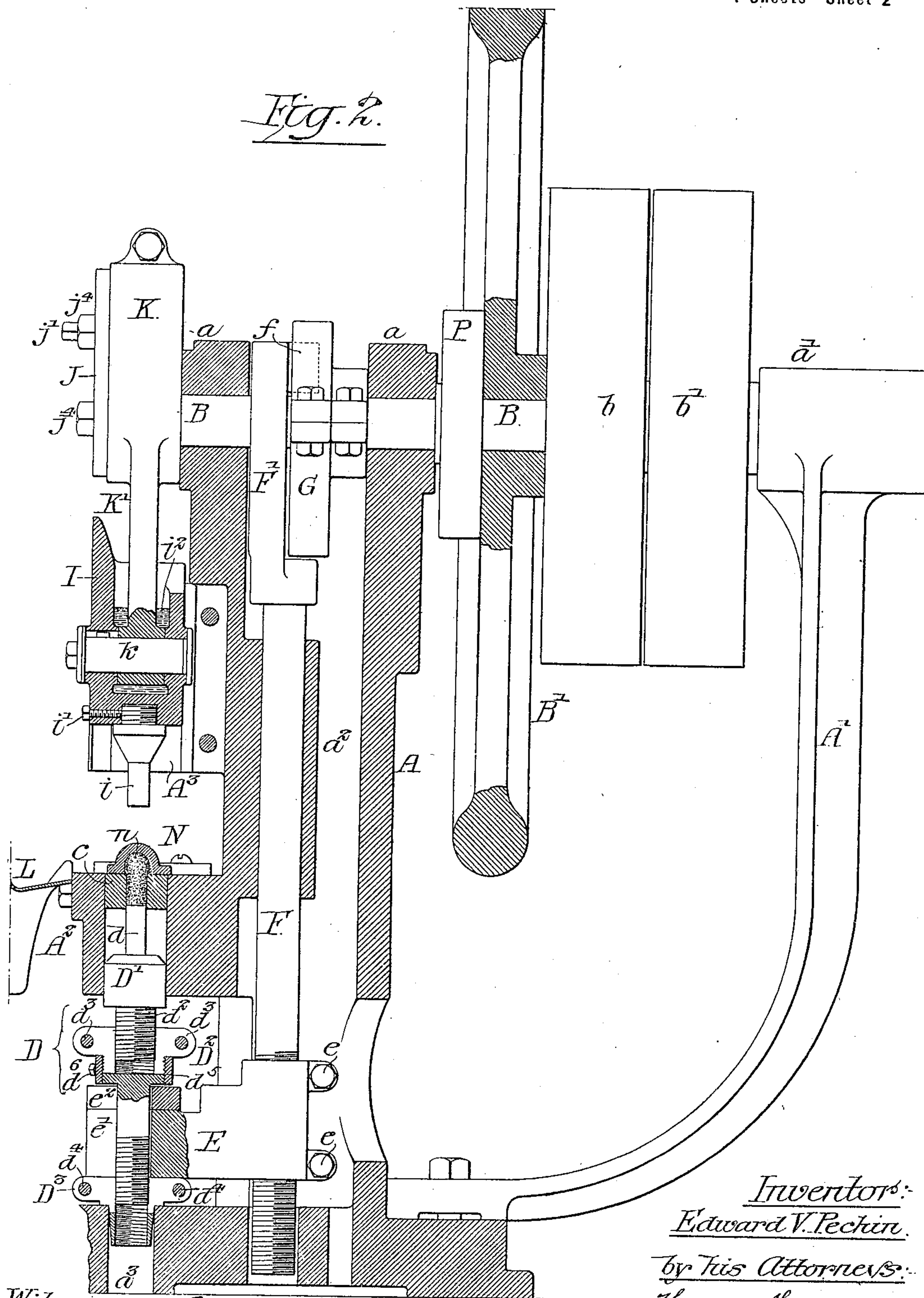
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(No Model.)

4 Sheets—Sheet 2

Fig. 2.



Witnesses: Frank A. Graham }
Louis H. Whitehead }

Inventor:
Edward V. Pechin.
by his Attorneys:
Hornum & Hornum

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Fig. 3.

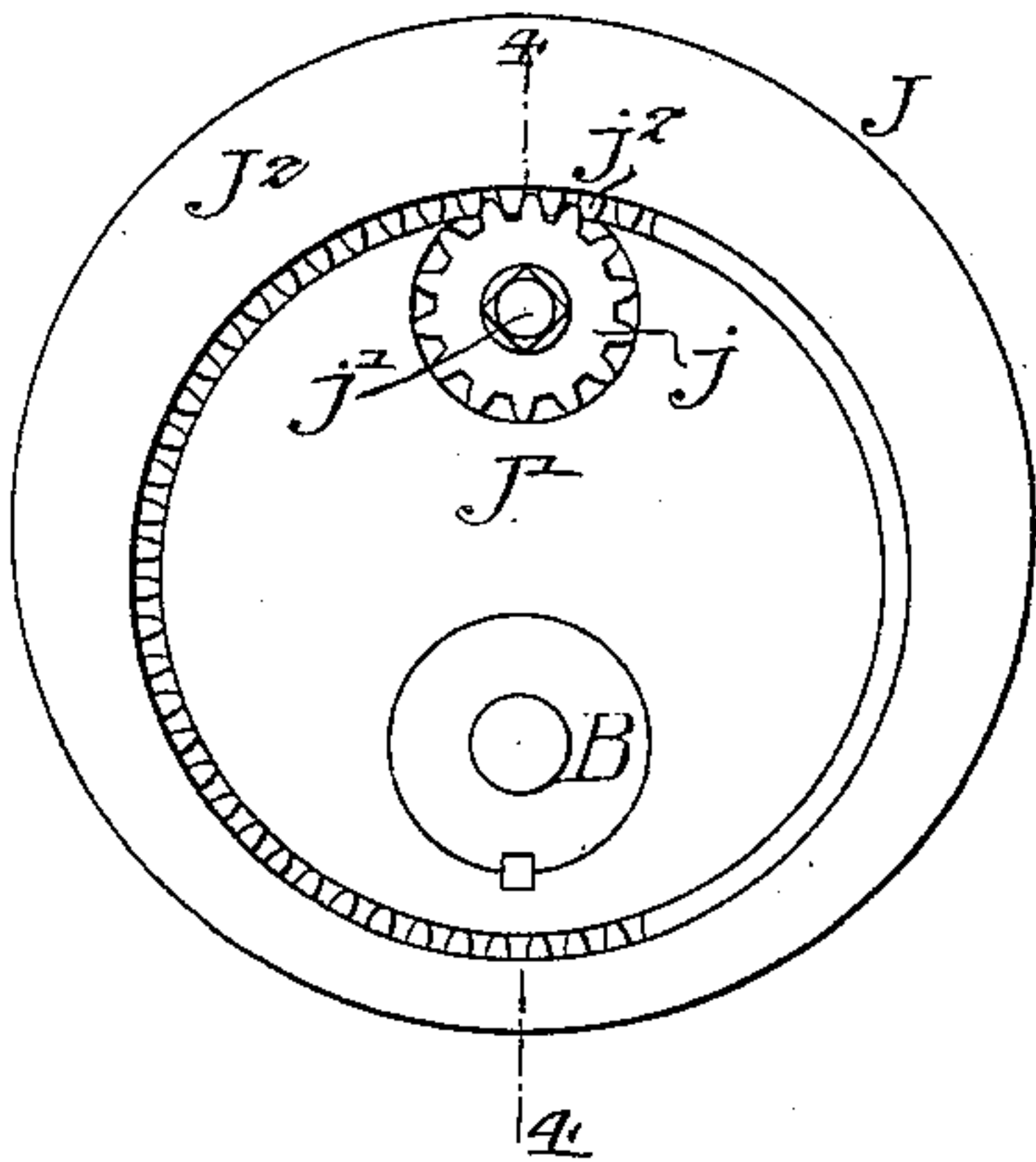


Fig. 4.

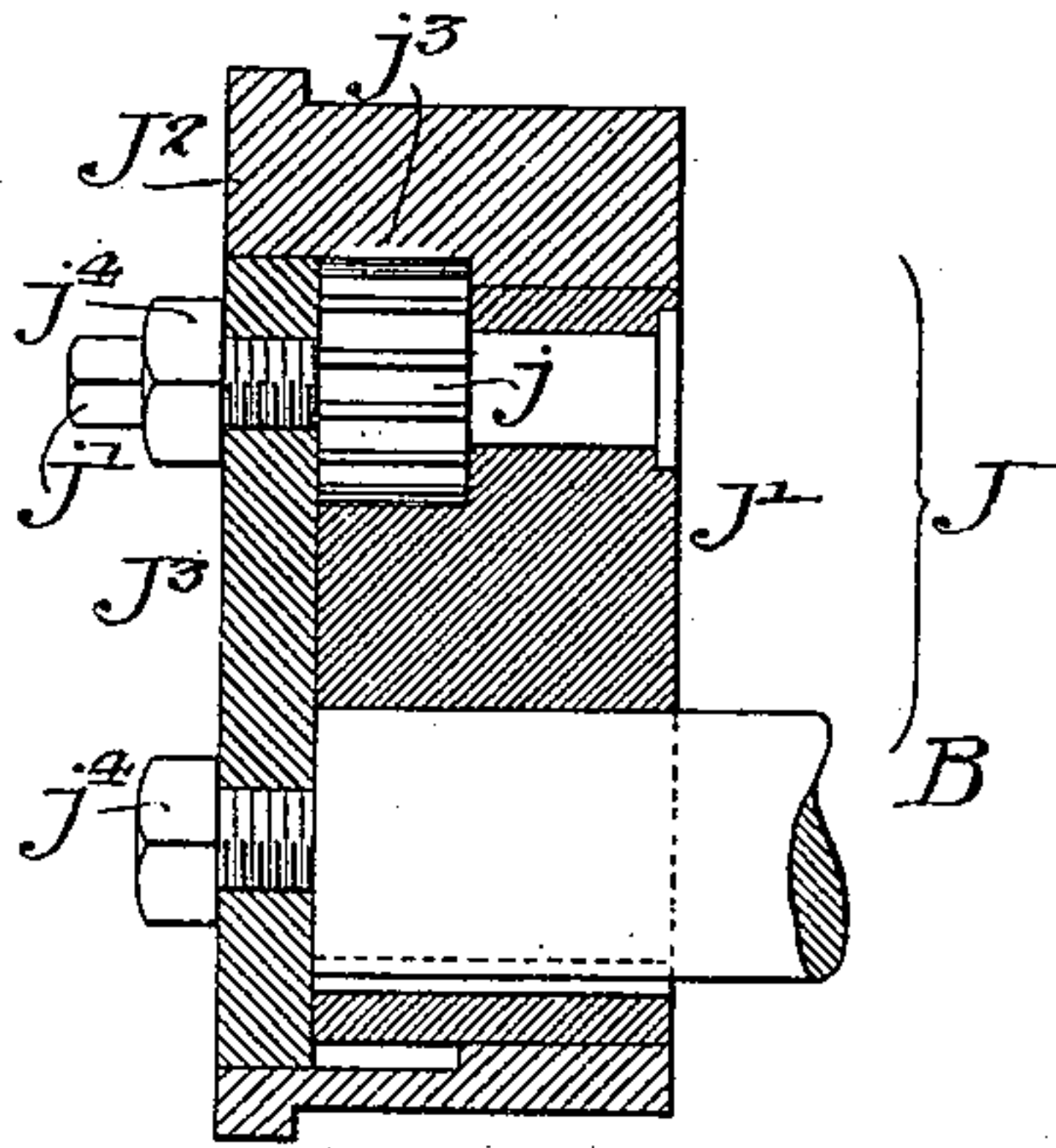


Fig. 5.

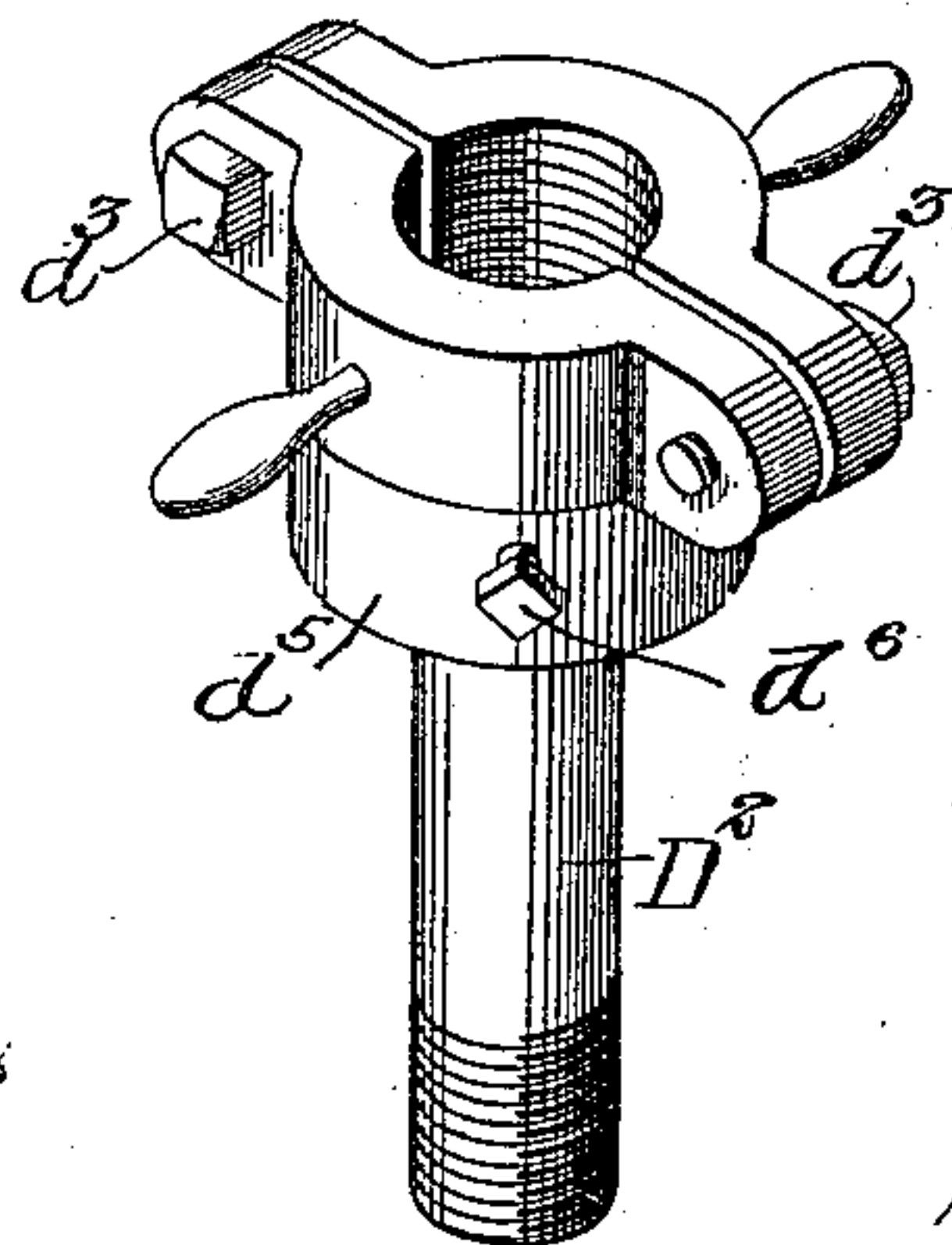
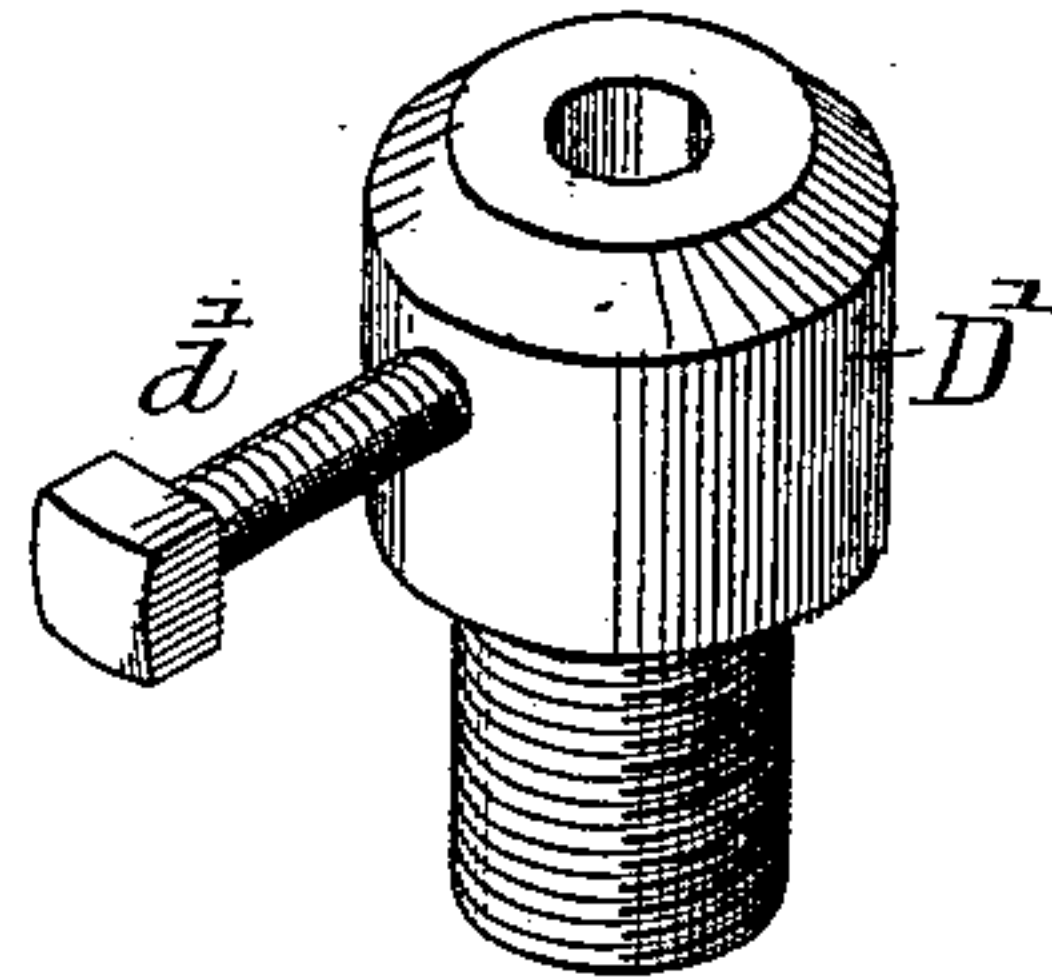
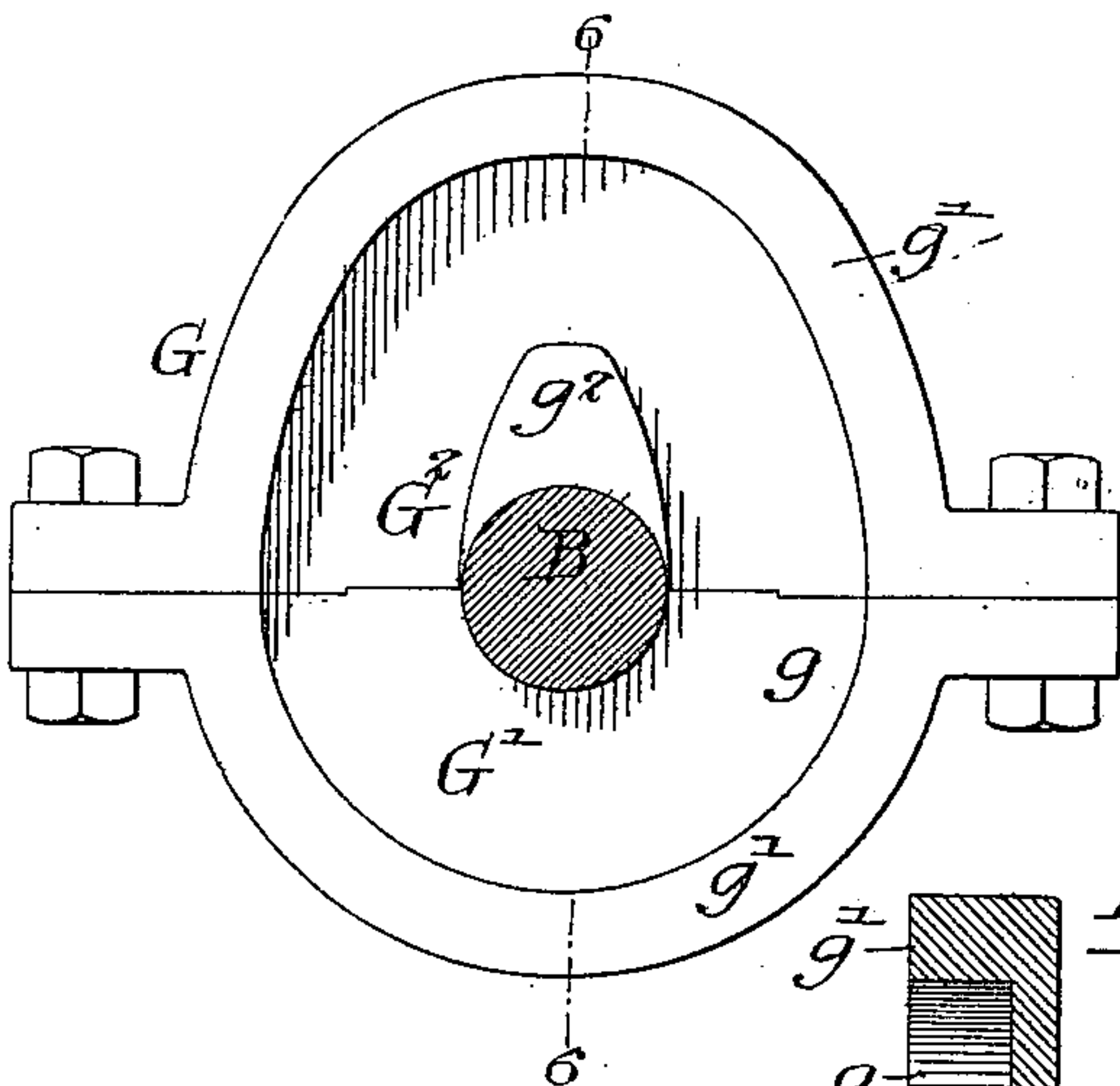


Fig. 7.

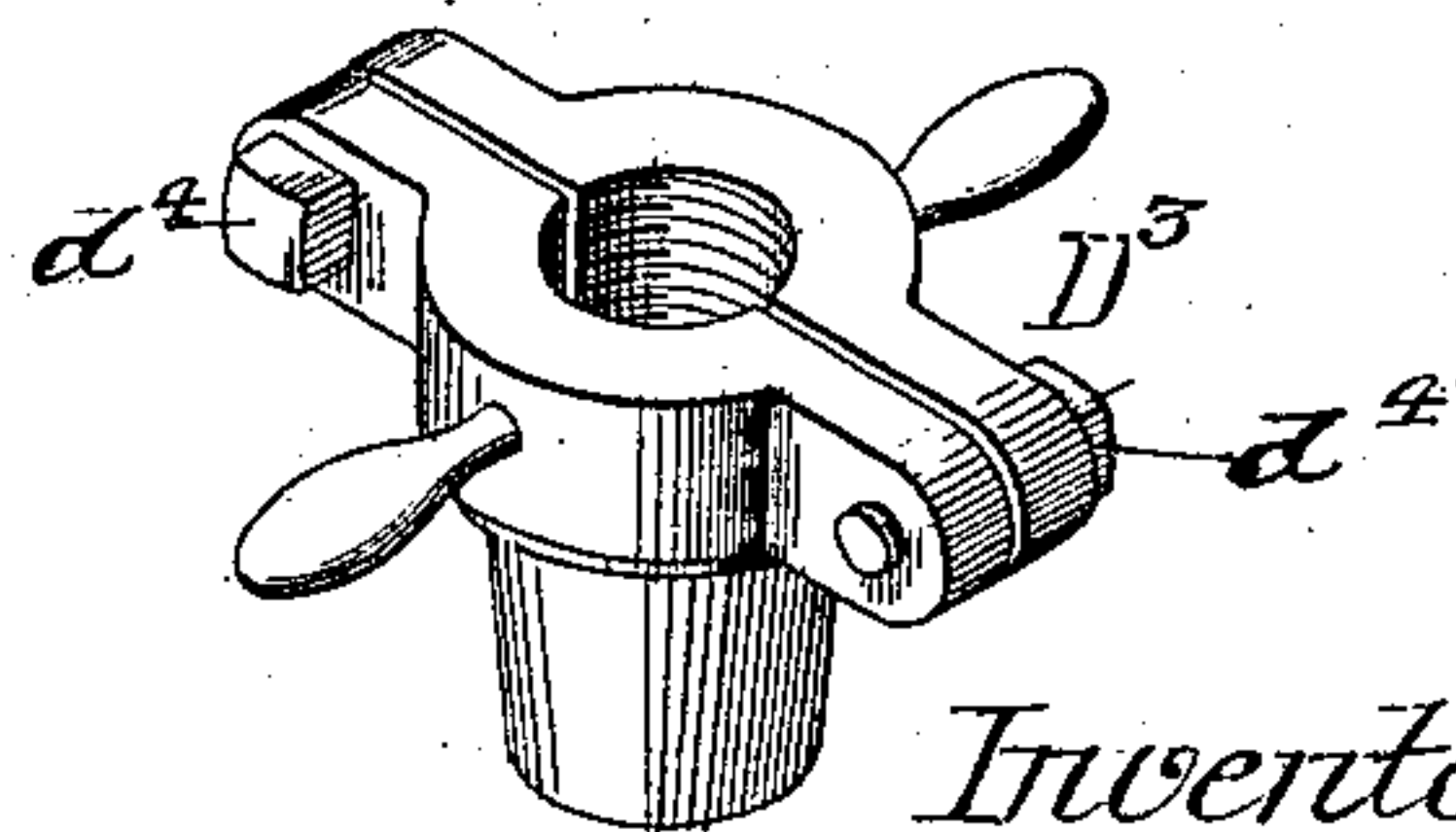
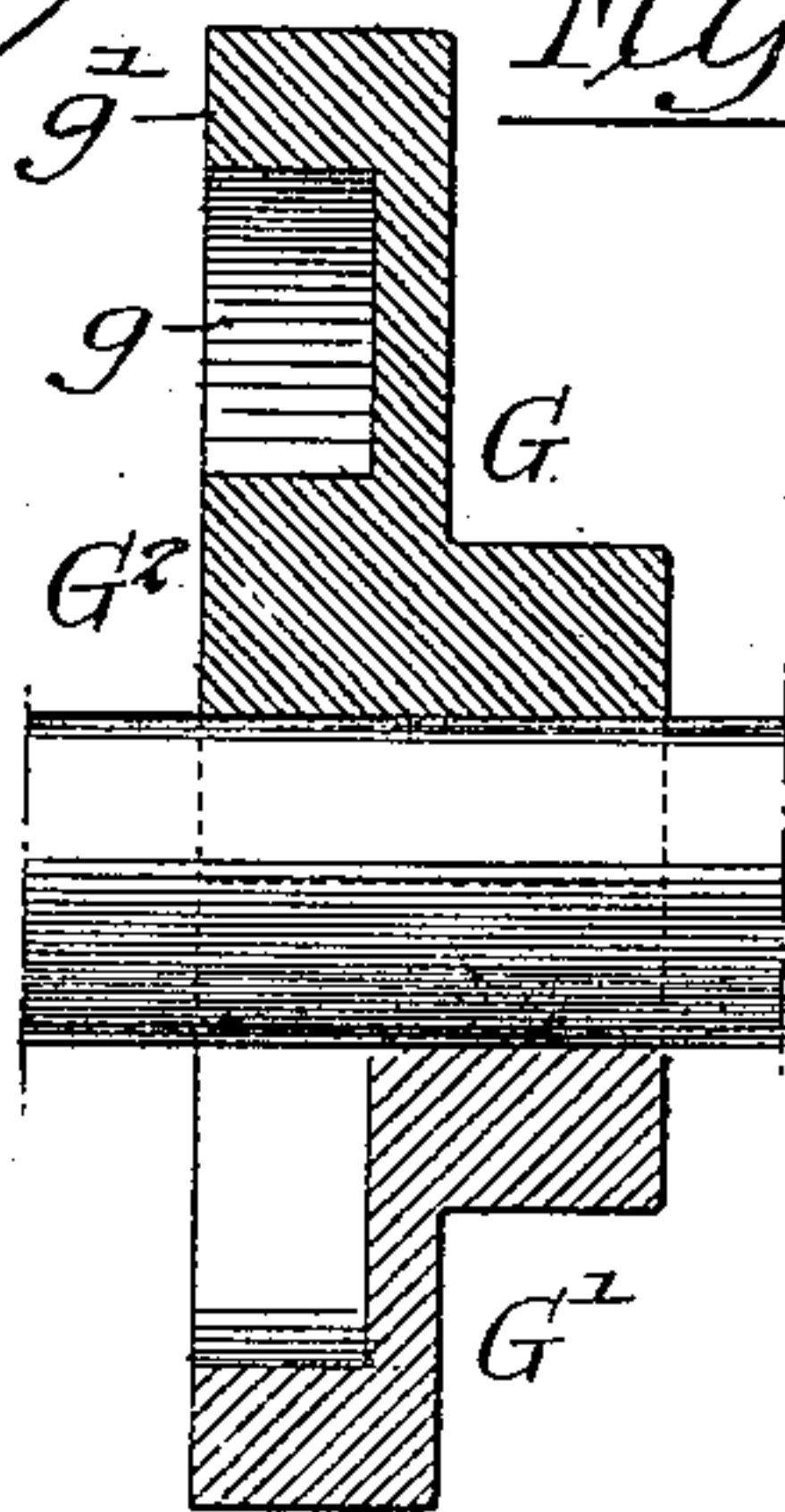


Fig. 6.



Witnesses:-

Frank L. Graham
Louis H. Whithead

Inventor:-

Edward V. Pechin.
by His Attorneys:-
Horn & Horn

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4 Sheets—Sheet 4.

Fig. 8.

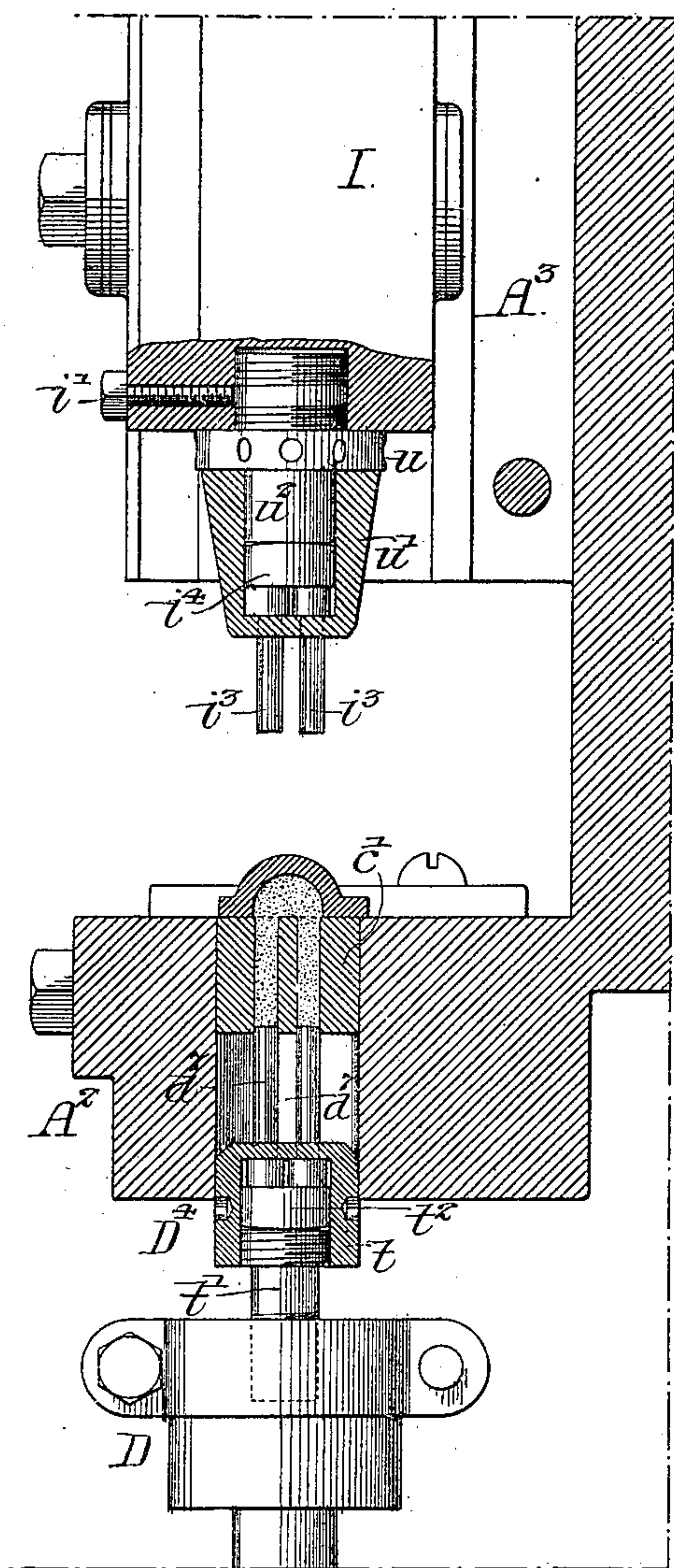


Fig. 9.

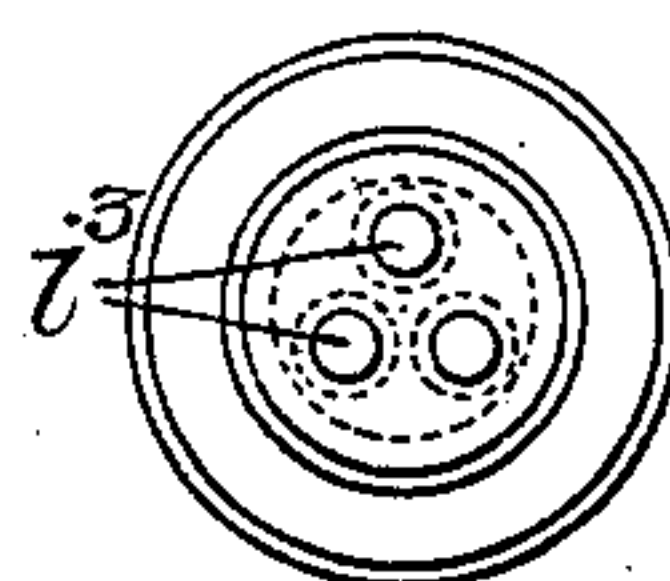
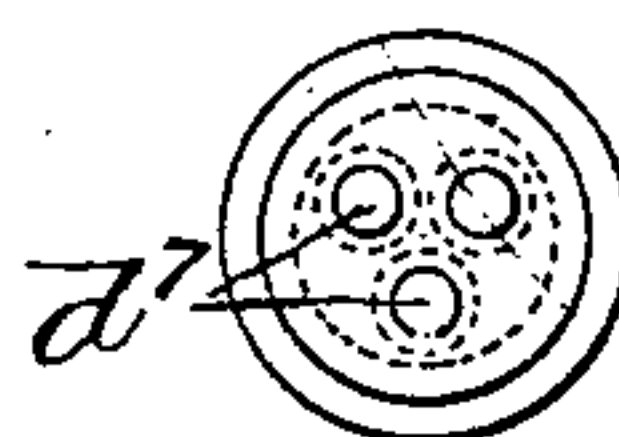


Fig. 10.



Witnesses:

Frank L. A. Graham.
Louis H. Wohlschlag.

Inventor:

Edward V. Pechin.

by his Attorneys:

Humm & Humm

UNITED STATES PATENT OFFICE.

EDWARD V. PECHIN, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO
THE H. K. MULFORD COMPANY, OF SAME PLACE.

TABLET-MAKING MACHINE.

SPECIFICATION forming part of Letters Patent No. 667,569, dated February 5, 1901.

Application filed December 7, 1899. Serial No. 739,537. (No model.)

To all whom it may concern:

Be it known that I, EDWARD V. PECHIN, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain
5 Improvements in Tablet-Making Machines, of which the following is a specification.

My invention relates to certain improvements in the tablet-making machine for which Letters Patent were granted to Henry K. Mulford, as assignee of Abraham R. Morris, on
10 the 3d day of January, 1899, No. 617,255.

The object of my invention is to improve the construction of the machine and adapt it for heavy work. This object I attain in the
15 following manner, reference being had to the accompanying drawings, in which—

Figure 1 is a front view of my improved tablet-making machine. Fig. 2 is a sectional view on the line 2 2, Fig. 1. Fig. 3 is a face
20 view of the eccentric with the cover-plate removed, illustrating the means of adjusting the upper plunger. Fig. 4 is a section on the line 4 4, Fig. 3. Fig. 5 is a view of the cam for operating the lower plunger. Fig. 6 is a
25 section on the line 6 6, Fig. 5. Fig. 7 is a detached perspective view of portions of the carrying mechanism of the lower plunger. Fig. 8 is a sectional view showing the construction when a group of punches is used.
30 Fig. 9 is an inverted plan view of the upper plunger, showing a group of three punches; and Fig. 10 is a plan view of the lower plunger, showing the three ejectors.

A is the frame of the machine, and adapted
35 to bearings a on this frame and to bearings a' on a bracket A' is the operating-shaft B. This shaft has a fly-wheel B' and belt-pulleys b b' , one being fast to the shaft and the other loose. Projecting from the front of the frame
40 is a table A^2 , in which is mounted the die c . This die is clamped to the table in the manner shown in the above-mentioned patent.

D is the lower plunger or ejector having a punch d , adapted to work in the die c . This
45 punch is detachably secured to the upper portion of the plunger D by means of a set-screw d' .

F is a rod adapted to a bearing a^2 on the frame of the machine. The lower portion of
50 this rod is threaded, and mounted on this portion of the rod is an arm E. The arm is

clamped to the rod by means of bolts e e or other fastenings. The upper end of the rod F has a head F' , and projecting from this head is a pin f , carrying a friction-roller adapted to a groove g in the cam G, Figs. 5 and 6.
55 This cam is secured to the shaft B. The arm E is slotted at e' , and the lower plunger D is adapted to the slotted portion of the arm. The lower plunger D is made in three sections—a head-section D' , a body-section D^2 , and a base-section D^3 . (Shown clearly in detail in Fig. 7.) The upper portion of the body-section D^2 is split and has a screw-threaded opening, to which is adapted the shank d^2 of
60 the head-section D' , and this head-section can be locked to the body-section after adjustment by means of the screw-bolts d^3 . The lower portion of the body-section D^2 is threaded, and this threaded end is adapted to a threaded
65 opening in the base-section D^3 . The upper portion of this base-section is split similar to the body-section, and the two parts can be locked together after adjustment by means of the bolts d^4 . The lower portion of the base-section is tapered, as shown in Figs. 2 and 7,
70 and this tapered portion is adapted to an orifice a^3 in the base of the machine. The object of making this tapered is that the lower plunger D will center itself in line with the
80 die and will prevent the snapping or bending of the punch. It will be seen that when the arm is in its lowest position the base-section of the plunger snugly fits the orifice a^3 , and the head-section D' fits the opening in
85 the table a^2 , and consequently the plunger is centered. The upper portion of the body-section is threaded, and adapted to this threaded portion is a ring d^5 , which is locked in position by a set-screw d^6 . This threaded ring
90 can be adjusted so as to raise the head of the body-section to enable it to come up flush with the under side of the table. This adjustment is necessary when the portion g^2 of the cam G wears away.

e^2 is a washer inserted between the upper end of the body portion D^2 and the arm E when it is desired to make a small grade of tablets; but in making large tablets the washer is removed and the plunger can then have its
100 full throw.

I is the upper plunger, adapted to guide-

ways A^3 on the frame A directly above the table A^2 . The upper punch i is screwed into the plunger, as shown in Fig. 2, and is locked in the adjusted position by means of a set-screw i' .

On the end of the shaft B is an eccentric J. This eccentric is made in two sections J' J^2 , and adapted to the eccentric is a strap K, having a rod K' pivoted to the upper plunger I by means of a pivot-pin k . The plunger I is hollow and is shaped to form an oil-reservoir i^2 , whereby the pivot is lubricated. The oil can be discharged from the reservoir through a petcock i^3 when it is desired to draw off the oil.

In order to alter the throw of the plunger I, I make the eccentric J in two parts, as above mentioned, and the portion J^2 is mounted on the portion J' . This portion J' is eccentric to the shaft B and has a pinion j , provided with a head j' , by which it can be turned, and on the portion J^2 is a rack j^2 , with which the teeth of the pinion engage. This portion J^2 is eccentric to the portion J' , so that by turning the pinion more or less throw can be given to the plunger which is connected to the eccentric. As shown in Fig. 3, the eccentric is adjusted to give the greatest throw to the plunger. The cap J^3 rests in the recess in the section J^2 and is secured to the section J' by bolts j^4 .

The cam G is made in two sections G' G^2 , clamped to the shaft B. Each section has an annular rim g' , and the section G^2 has a projecting portion g^2 of such a height as to give the throw desired. By this construction I can make a series of sections G^2 , having portions g^2 of different heights, and the sections can be readily clamped to the shaft and to the section G' , so that the rod F can be reciprocated to a greater or less extent, according to the shape of the section G^2 .

The feeding mechanism of this machine is similar to that described in the above-mentioned patent, and therefore need not be described and illustrated in detail in this application.

M is a hopper to receive the material. This hopper is connected to the reciprocating plate N, having a tubular projection n , and this projection is connected to the hopper by means of the flexible tube M' . The flexible tube can be coupled to the hopper in any suitable manner, preferably so that it can be readily removed when necessary. The hopper is supported on a bracket M^2 , secured to the frame of the machine. The plate N is reciprocated and agitated over the die by a cam P on the shaft B, and adapted to the groove in this cam is a pin s , carried by the arm s' of a lever S. The other arm s^2 of this lever is connected to the plate N. By this means the plate N is moved over the opening in the die, and while in this position it is agitated so as to allow the material to pack evenly in the die and then return so as to allow the plungers to compress the material.

As the plate moves away from the die the upper plunger compresses the material in the die and the lower plunger is raised so as to eject the compressed tablet. As the plate moves to recharge the die it removes the tablet from the table to a chute L, secured at the side of the table.

In Figs. 1 and 2 I have shown the machine set to make a single tablet at each operation, and in Figs. 8, 9, and 10 I have shown the means for making three tablets at each operation. The working parts are the same as shown in Fig. 2; but in place of the single punches illustrated I use a triple set of punches, as clearly shown in Fig. 8. In this instance the lower plunger D has a head D^4 , which is made in two parts t t' , one screwed into the other, and above the head of the portion t' is a cylindrical block t^2 , on which rests the heads of the punches d^7 . The under side of the block t^2 is rounded, so that it will accommodate itself to the punches. The upper ends of the punches are guided in the die c' , which has in the present instance three orifices, into which the material is charged and in which the tablets are formed. The upper punch-carrier is made in two parts u u' . The portion u is screwed into the upper plunger i and secured thereto by a set-screw i' , and this portion has an extension u^2 , and between this extension and the heads of the punches i^3 is a block i^4 , rounded on its upper surface, so that it will have a slight rocking motion on the extension u^2 of the portion u . The punches are adapted to holes in the portion u' and are guided by this portion so as to properly aline with the orifices in the die. Thus if there is a slight inequality in the length of the heads of the punches the rocking block will accommodate itself to this inequality, holding the punches rigid and preventing the breaking of the punches or other parts of the machine.

It will be understood that while I have shown a group of three punches two or more punches can be used without departing from my invention.

I claim as my invention—

1. The combination in a tablet-machine, of a frame, a lower plunger, an arm carrying the said plunger, a rod on which said arm is mounted, a shaft, a cam on said shaft for operating the said rod, said cam being made in two sections whereby the movement of the rod can be altered by substituting different-shaped sections, substantially as described.

2. The combination in a tablet-machine, of a driving-shaft, a rod, means for actuating the rod, an arm on the rod, a die mounted in the table, a lower plunger, a punch carried by the said plunger, the lower portion of the plunger being tapered and adapted to an orifice in the base of the machine, whereby the plunger will center itself in respect to the die, substantially as described.

3. The combination of the frame of a tablet-machine, a rod, means for operating the

rod, an arm on the rod, a plunger made in three sections, the base-section being adapted to the screw-threaded end of the body-section having its lower portion tapered, said
 5 portion being constructed to enter an orifice in the base of the machine, and means for locking said base-section to the body-section, substantially as described.

4. The combination of a base-frame, a rod,
 10 means for operating the rod, an arm on the rod, said arm being grooved, a lower plunger adapted to the groove, said plunger being made in three sections, the body or central section being screw-threaded, a threaded ring
 15 on the screw-threaded section, and a washer mounted between the head of the body-section and the arm, substantially as and for the purpose set forth.

5. The combination in a tablet-machine, of
 20 a frame, an upper plunger adapted to guides in the frame, a punch carried by the upper plunger, a shaft, an eccentric mounted on said shaft, a strap on the eccentric and connected to the plunger, said eccentric made
 25 up of two sections, one mounted upon the other in the same plane, a pinion on the inner section, and a rack on the outer section with which the pinion engages, and means for turning said pinion so as to alter the throw
 30 of the eccentric, substantially as described.

6. The combination in a tablet-machine, of
 a frame, an upper plunger adapted to slide on the frame, a shaft, an eccentric on the shaft, an eccentric-strap mounted on the ec-
 35 centric and having an arm, a pivot-pin con-

necting the arm to the plunger, said plunger being hollow forming a reservoir for oil around the pivot-pin, substantially as described.

7. The combination in a tablet-machine, of
 a punch-carrier made in two sections, two or
 40 more punches projecting through one of said sections, heads on the punches, and a block mounted between the heads of the punches and the other section, substantially as described.
 45

8. The combination in a tablet-machine, of
 a die, two or more orifices therein, a punch-
 carrier, two or more punches adapted to the orifices in the die, a block back of the punches
 50 and having a rounded bearing so that it will accommodate itself to any unevenness of the heads of the punches, substantially as described.

9. The combination in a tablet-machine, of
 a die, two or more orifices therein, a punch-
 carrier made up of two sections, two or more
 55 headed punches, said punches adapted to extend through openings in one of said sections, a block mounted between the heads of the punches and the other section, said block be-
 60 ing rounded at its back so as to allow a limited motion to the punches, substantially as described.

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

EDWARD V. PECHIN.

Witnesses:

WILL. A. BARR,
 JOS. H. KLEIN.