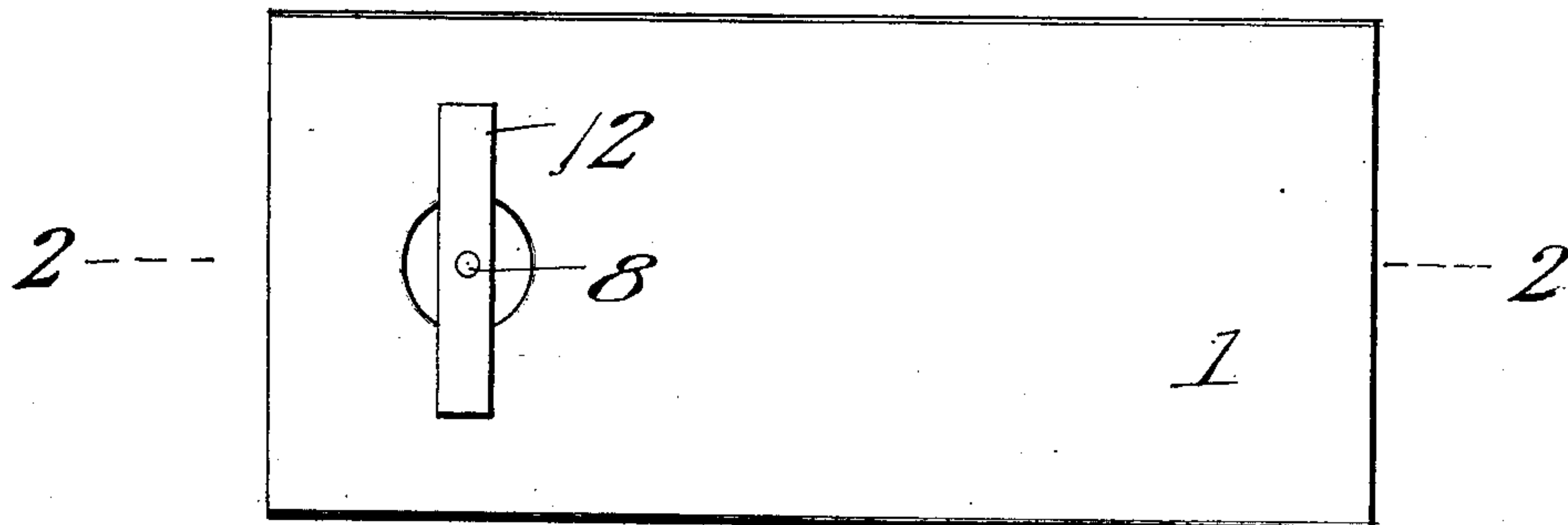


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VALVE FOR SELF PLAYING INSTRUMENTS.

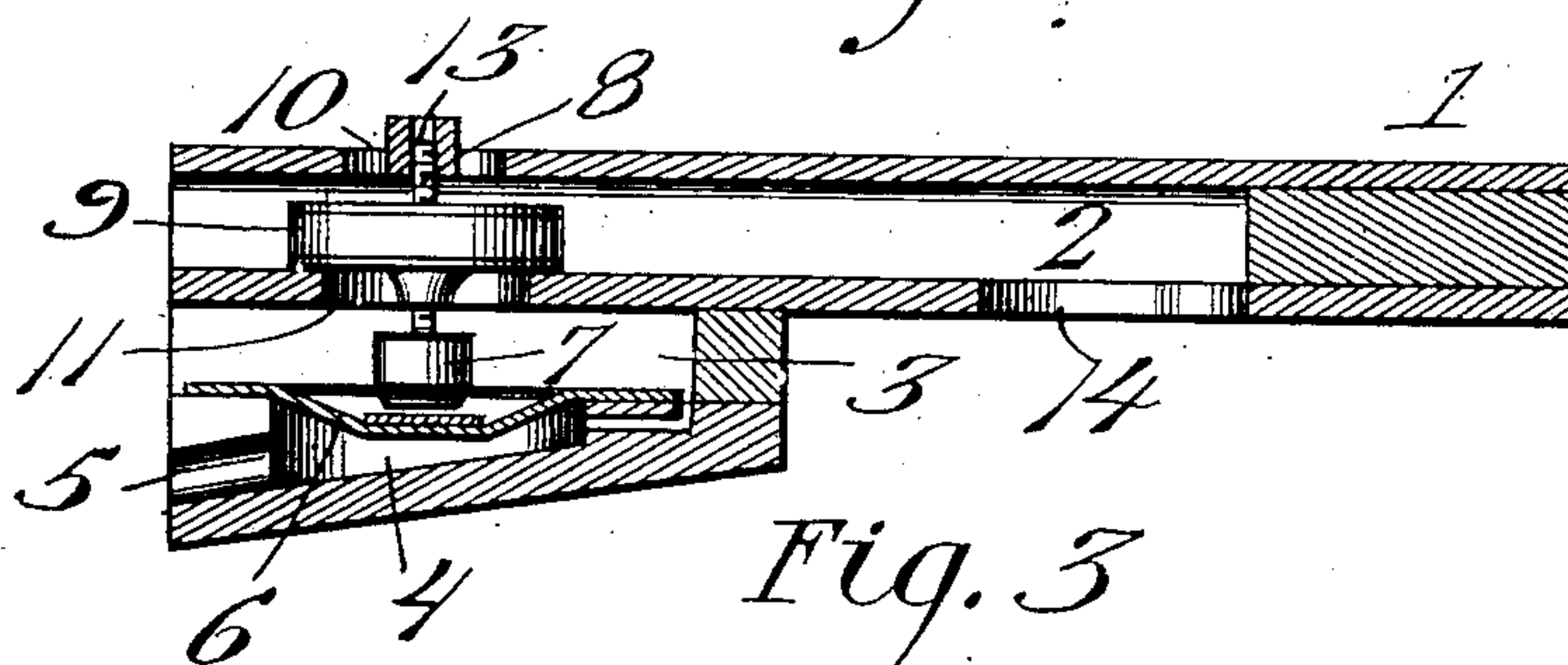
APPLICATION FILED JAN. 16, 1906.

2 SHEETS—SHEET 1.

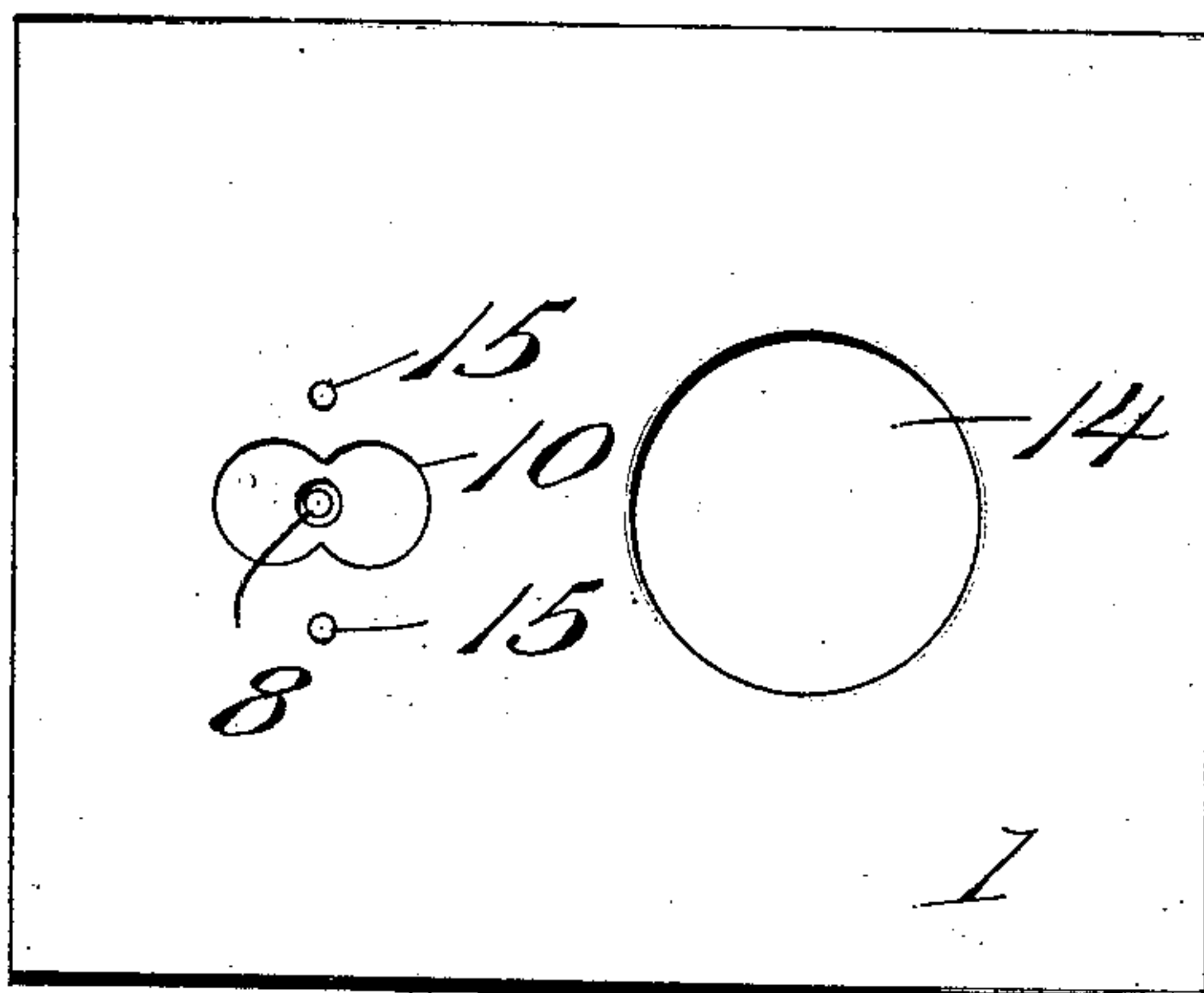
*Fig. 1.*



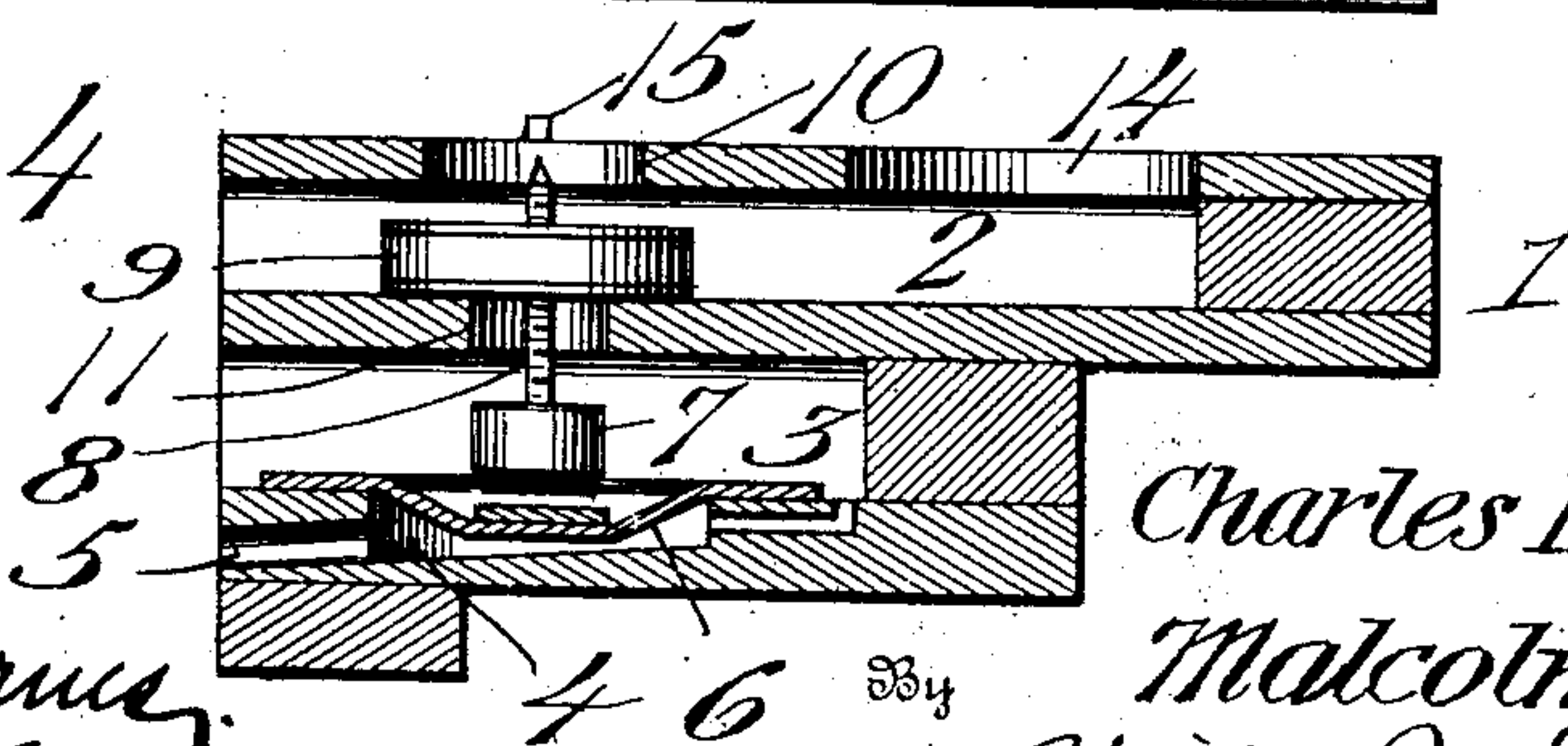
*Fig. 2.*



*Fig. 3.*



*Fig. 4.*



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No. 861,987.

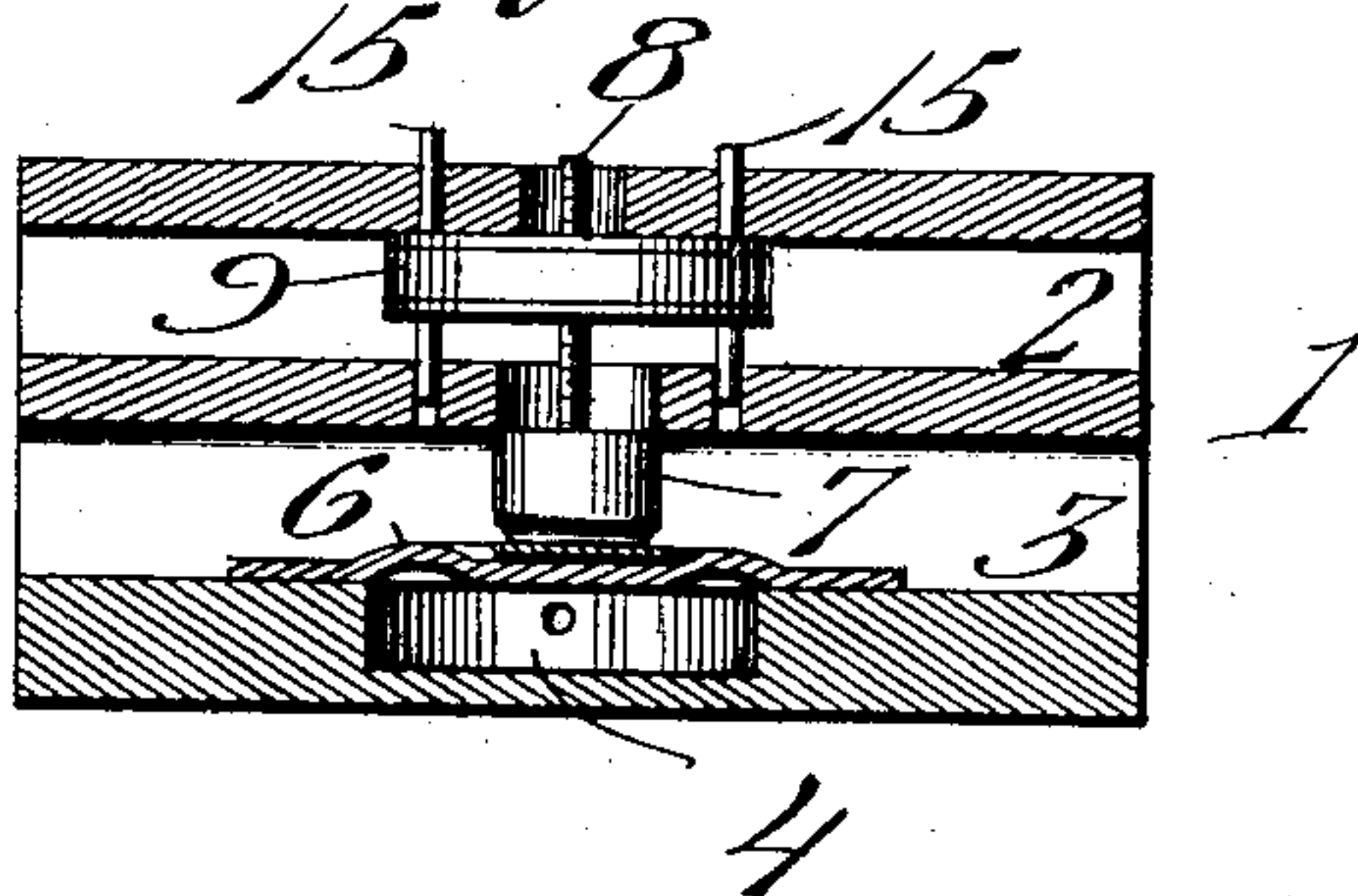
PATENTED JULY 30, 1907.

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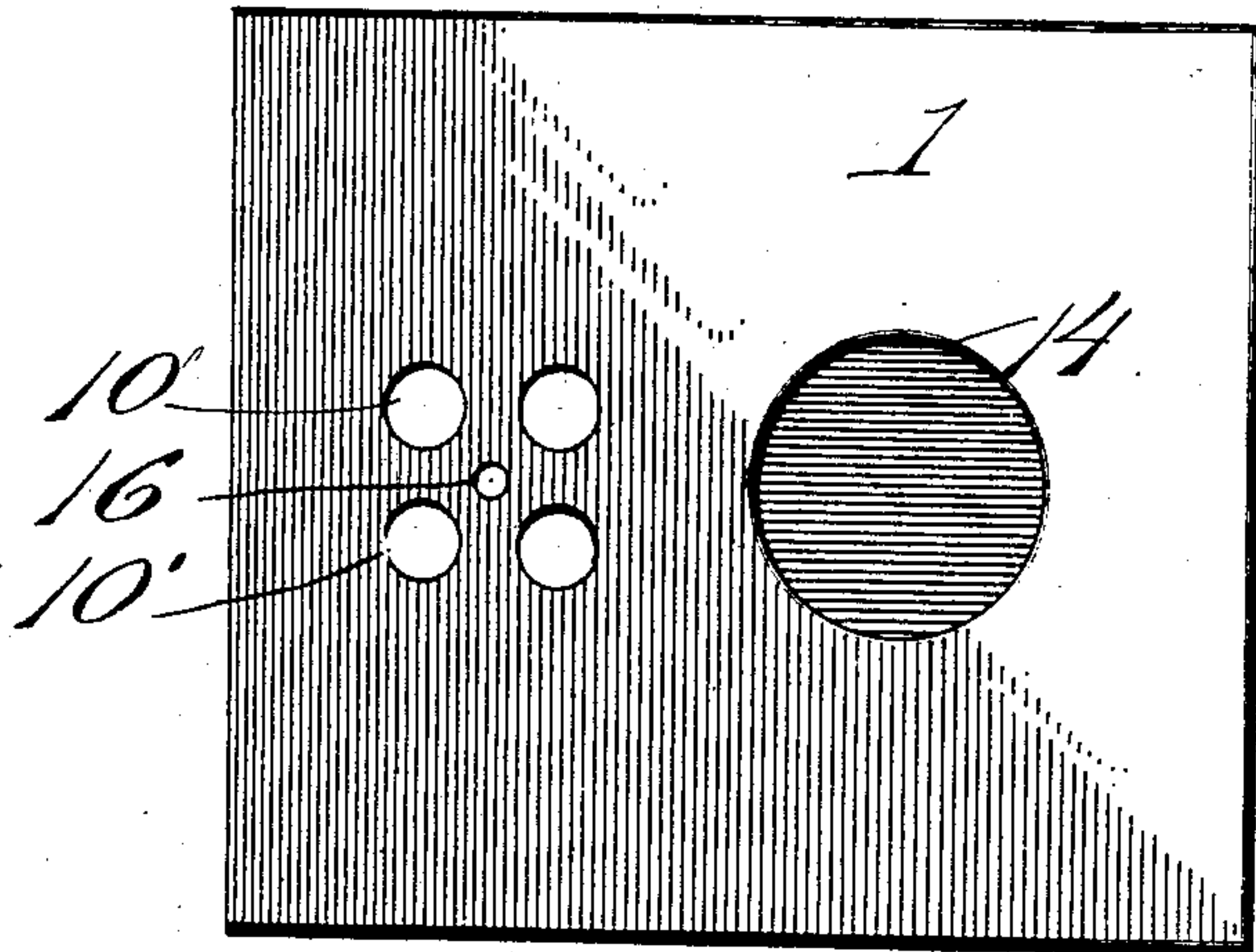
APPLICATION FILED JAN. 16, 1906.

2 SHEETS--SHEET 2.

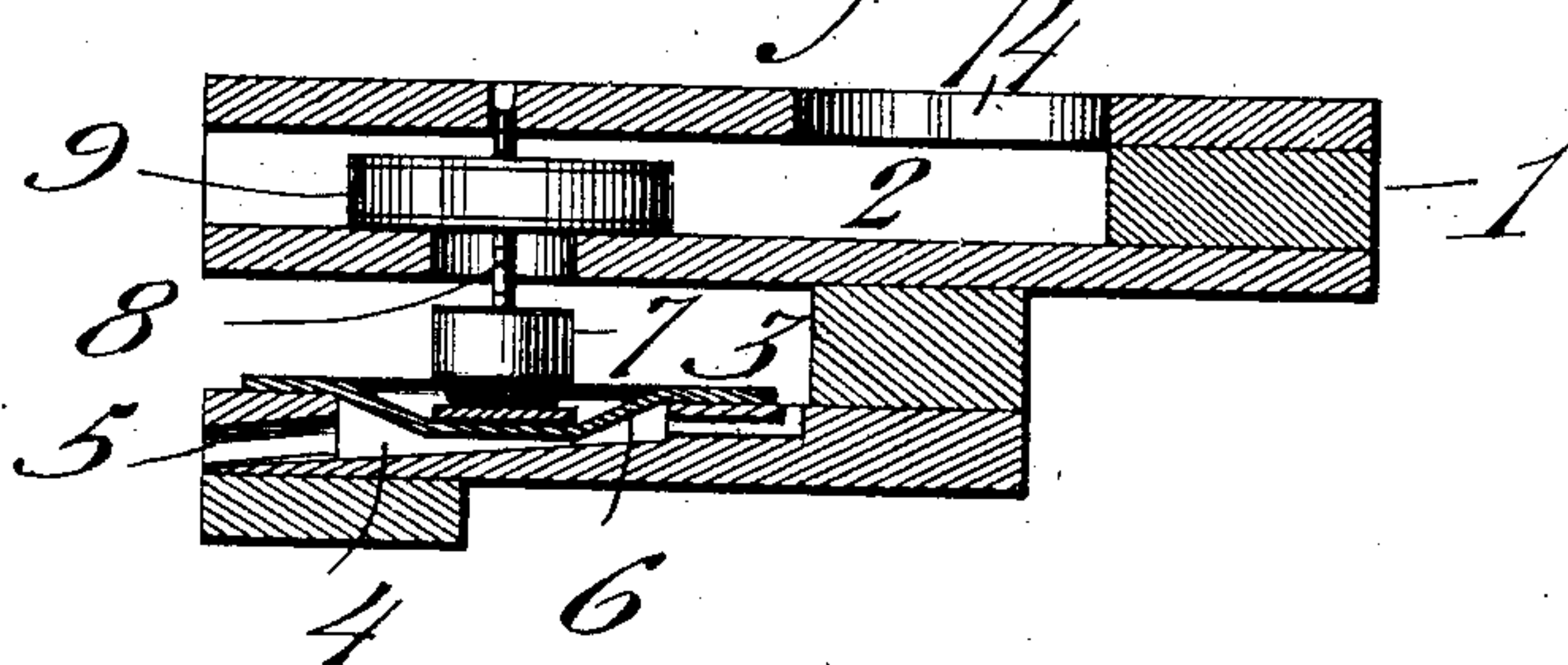
*Fig. 5*



*Fig. 6.*



*Fig. 7*



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# UNITED STATES PATENT OFFICE.

CHARLES H. JOHNSON AND MALCOLM BLANCH, OF WORCESTER, MASSACHUSETTS.

## VALVE FOR SELF-PLAYING INSTRUMENTS.

No. 861,987.

Specification of Letters Patent.

Patented July 30, 1907.

Application filed January 16, 1906. Serial No. 296,356.

*To all whom it may concern:*

Be it known that we, CHARLES H. JOHNSON and MALCOLM BLANCH, citizens of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented new and useful Improvements in Valves for Self-Playing Instruments, of which the following is a specification.

This invention relates to self-playing musical instruments, the object of the invention being to provide a simple, cheap and effective puppet valve controlling the passages leading into the opposite sides of the valve chamber, the invention relating particularly to new and useful means for guiding and steadying said valve in its movements, so as to insure a perfect and reliable seating of the valve at the opposite ends of its throw; a further object of the invention being to provide means whereby the valve may be adjusted on its stem for regulating the limits of movement of the valve to secure a quick and perfect operation of the same.

With the above and other objects in view, the invention consists in the novel construction, combination and arrangement, hereinafter more fully described, illustrated and claimed.

In the accompanying drawings, Figure 1 is a plan view of a sufficient portion of the framework of the musical instrument to illustrate the present invention. Fig. 2 is a vertical longitudinal section through the same. Figs. 3 and 4 are respectively plan and vertical sectional views of a slightly modified arrangement. Fig. 5 is a vertical section taken at right angles to Fig. 4. Figs. 6 and 7 are respectively, plan and vertical sectional views showing another slightly modified arrangement of the same mechanism.

Referring to the drawings, 1 represents a portion of the framework of a musical instrument containing the valve chamber 2, the vacuum chamber 3 shown as arranged beneath the valve chamber, and the primary pneumatic chamber 4, arranged beneath the valve chamber 3.

The chamber 4 is provided with an opening 5, to which is connected the air supply which leads thereto from the usual tracker rail (not shown), over which the perforated sheet music passes, the air being admitted through the perforations of the sheet music in the usual manner, and conveyed to the chamber 4. The chamber 4 is otherwise closed and covered by a flexible diaphragm 6 which constitutes the primary pneumatic. Arranged close to the primary pneumatic 6 is a contact head 7 on one end of the valve stem 8, which carries the puppet valve 9.

The puppet valve 9 operates within the valve chamber 2 and is adapted to alternately close an opening 10, leading to the outer air and another opening or air passage 11 affording communication between the vacuum

chamber 3 and the valve chamber 2. The stem 8 is threaded and the puppet valve 9 is internally threaded and mounted on said stem, thus providing for adjusting the valve 9 lengthwise of the stem 8, to bring the contact head 7 into the desired proximity and relation to the primary pneumatic 6. A fixed cross-bar 12 extends across the opening 10 and is provided with a guide opening 13 in which the outer end of the stem 8 is received and guided in its sliding movement.

14 designates the port which leads to a motor pneumatic (not shown).

It will be understood that by reason of the vacuum in the chamber 3, the valve 9 is held normally closed. Where the perforation in the sheet music passes over the tracker rail, air is admitted to the chamber 4 and acts upon the primary pneumatic, causing the latter to act upon the contact head 7 and move the valve 9, so as to close the opening 10 and open the air passage 11. This creates a partial vacuum in the valve chamber 2 and causes the air to rush from the motor pneumatic through the port 14 and valve chamber 2 into the vacuum chamber 3, suitable means being provided for allowing the air to pass to the outer atmosphere. As soon as the perforation in the sheet music passes beyond the tracker rail, the air is again exhausted from the vacuum chamber, which causes the valve 9 to seat itself again over the passage 11.

It will be understood that the air is exhausted by a treadle operated bellows (not shown), the same being of the usual construction and arrangement.

In order to effectively guide the valve 9 in its sliding movement, said valve may be provided at opposite places with laterally projecting guide pins 15 which move in guide openings 16 in the frame 1, as shown in Figs. 3 and 5, the guide openings being arranged at opposite sides of the opening 10, as best illustrated in Fig. 3, the shape of the opening 10 being made to correspond, and shown as somewhat resembling a dumb-bell in shape.

Another plan of providing the opening 10 is shown in Fig. 6, in which a plurality of openings 10' are employed instead of a single opening, thereby leaving space for a small central hole 16 in which the stem of the valve 9 is received and guided, as best shown in Fig. 7.

By the construction and arrangement above described, in any of the forms shown and referred to, it will be seen that the puppet valve is effectively guided in its sliding movement, and thereby caused to effectively seat itself at either end of its throw for closing the openings or air passages 10 and 11; also, that the valve is adjustable on its stem to bring the same into proper relation to the seats at opposite sides thereof.

Under the arrangement shown in Figs. 3, 4 and 5,

the guide pins 15 are extended on both sides of the valve 9, additional guide openings being formed in the wall between the valve chamber 2 and vacuum chamber 3 to receive said pins, thus insuring the guidance 5 of the valve and avoiding any possibility of the valve wobbling and improperly seating itself.

I claim:

1. In a self-playing musical instrument, the combination 10 with the frame of the instrument and a shallow valve chamber with oppositely arranged air passages in the top and bottom thereof, of a disk shaped puppet valve movable between said openings and having opposite flat faces co-operating with the adjacent top and bottom walls of the valve chamber to alternately open and close the air pas- 15 sages therein, a threaded valve stem connected to said valve and extending through one of the air passages in said valve chamber, a contact head adjustable on said threaded stem, a primary pneumatic operating on said head but separate therefrom, and one or more guide pins carried by 20 said valve and working in guide openings in the upper and lower walls of the valve chamber.

2. In a self-playing musical instrument, the combination with the frame of the instrument and a shallow valve chamber provided with oppositely arranged air passages in the top and bottom walls thereof, of a disk-shaped puppet 25 valve movable between said openings and having opposite flat faces coöperating with the adjacent top and bottom walls of the valve chamber to alternately open and close the air passages therein, a valve stem, a contact head thereon, a primary pneumatic operating on said valve but 30 separate therefrom, and a plurality of guidepins projecting upward and downward from the opposite faces of said valve and located at opposite sides of the valve center, said pins being received in guide openings in the oppo- 35 site walls of the valve chamber.

In testimony whereof, we affix our signatures in presence of two witnesses.

CHARLES H. JOHNSON.  
MALCOLM BLANCH.

Witnesses:

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EDWARD A. THOMPSON.