

T. DANQUARD.
 TRACKER FOR MECHANICAL MUSICAL INSTRUMENTS.
 APPLICATION FILED FEB. 11, 1905.

FIG. 1.

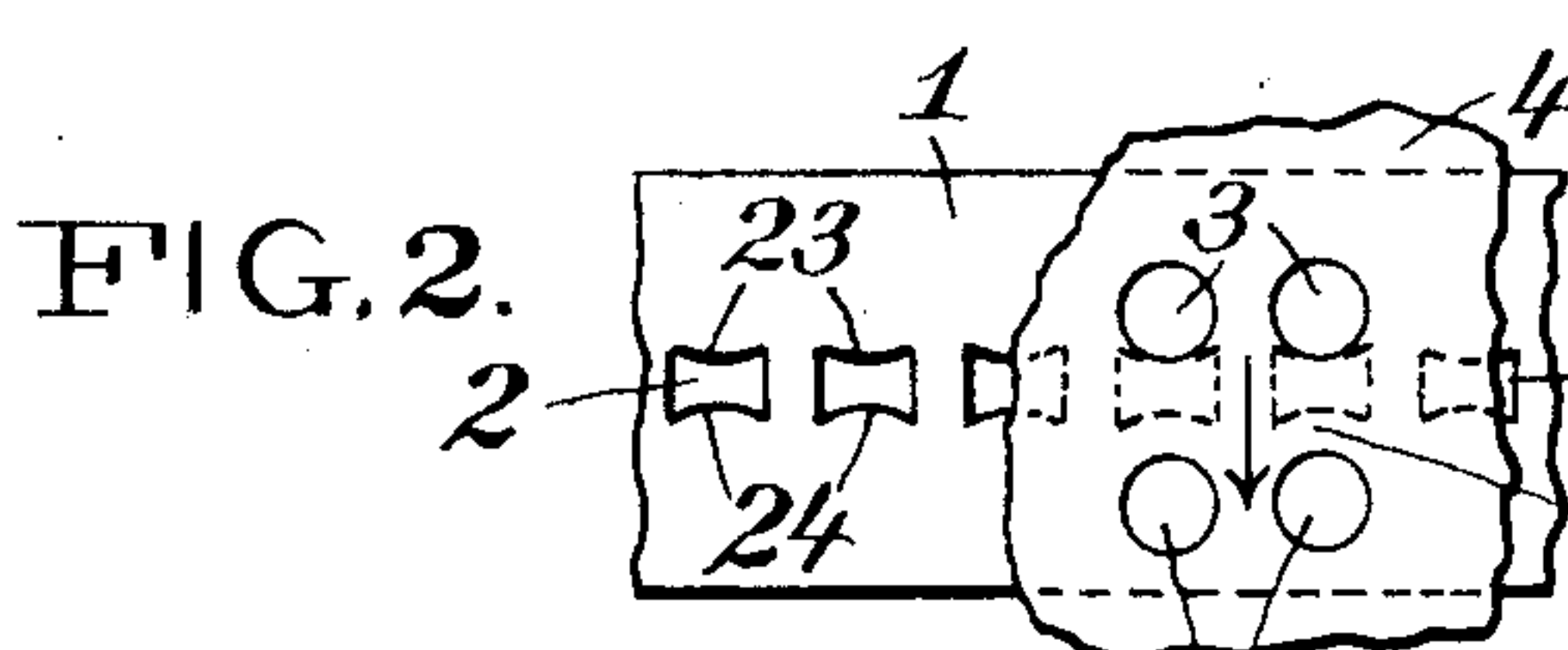
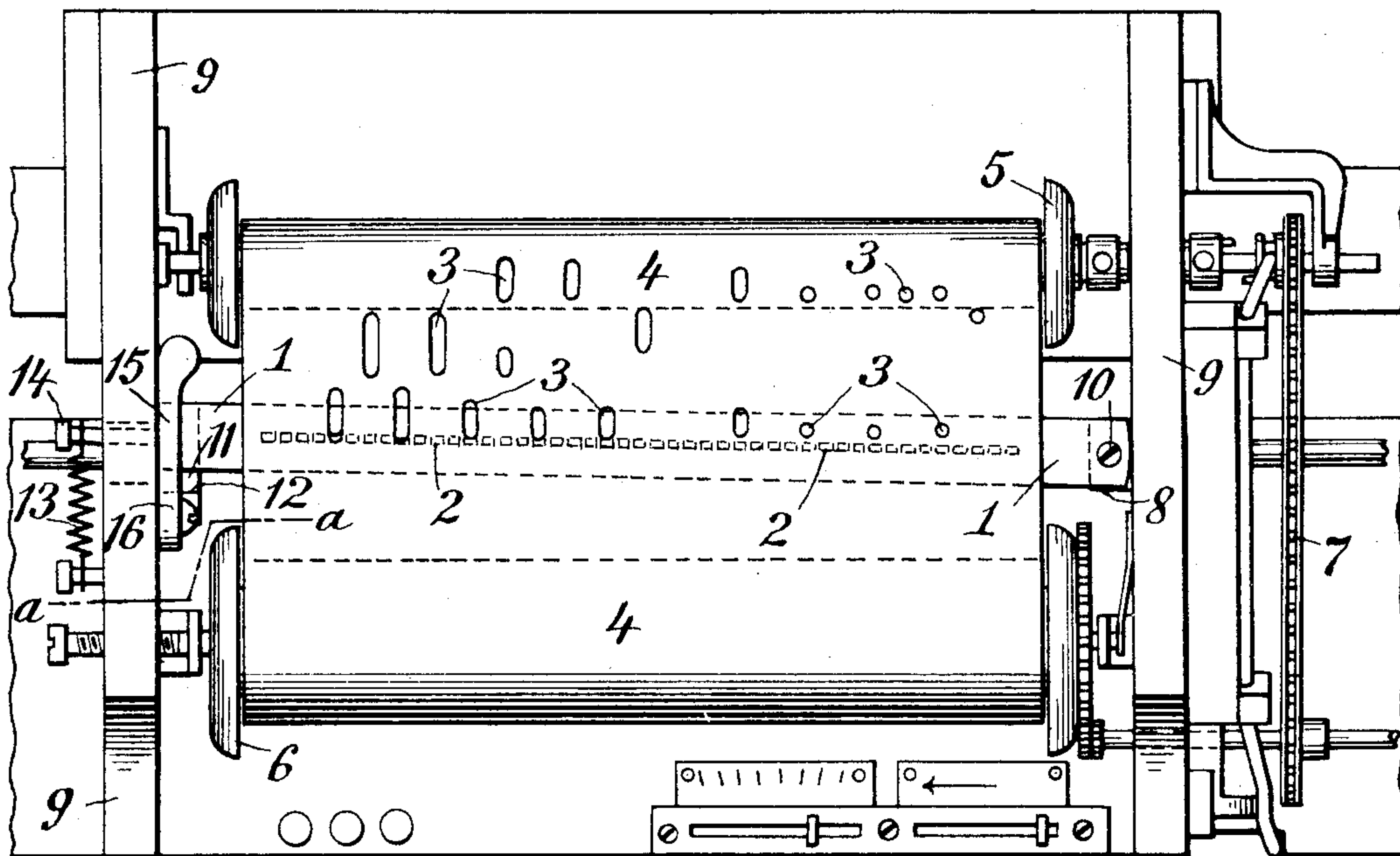


FIG. 2.

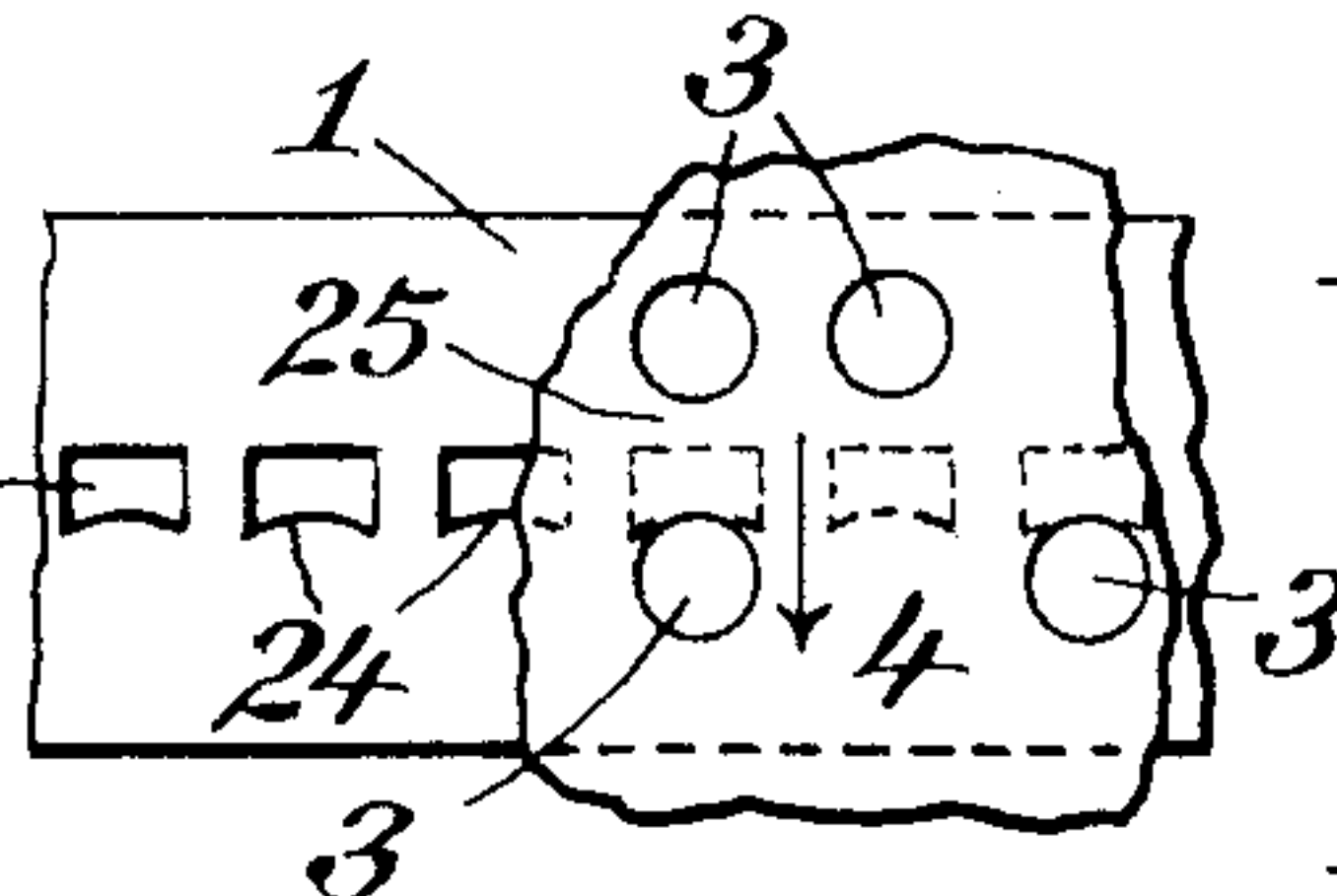


FIG. 3.

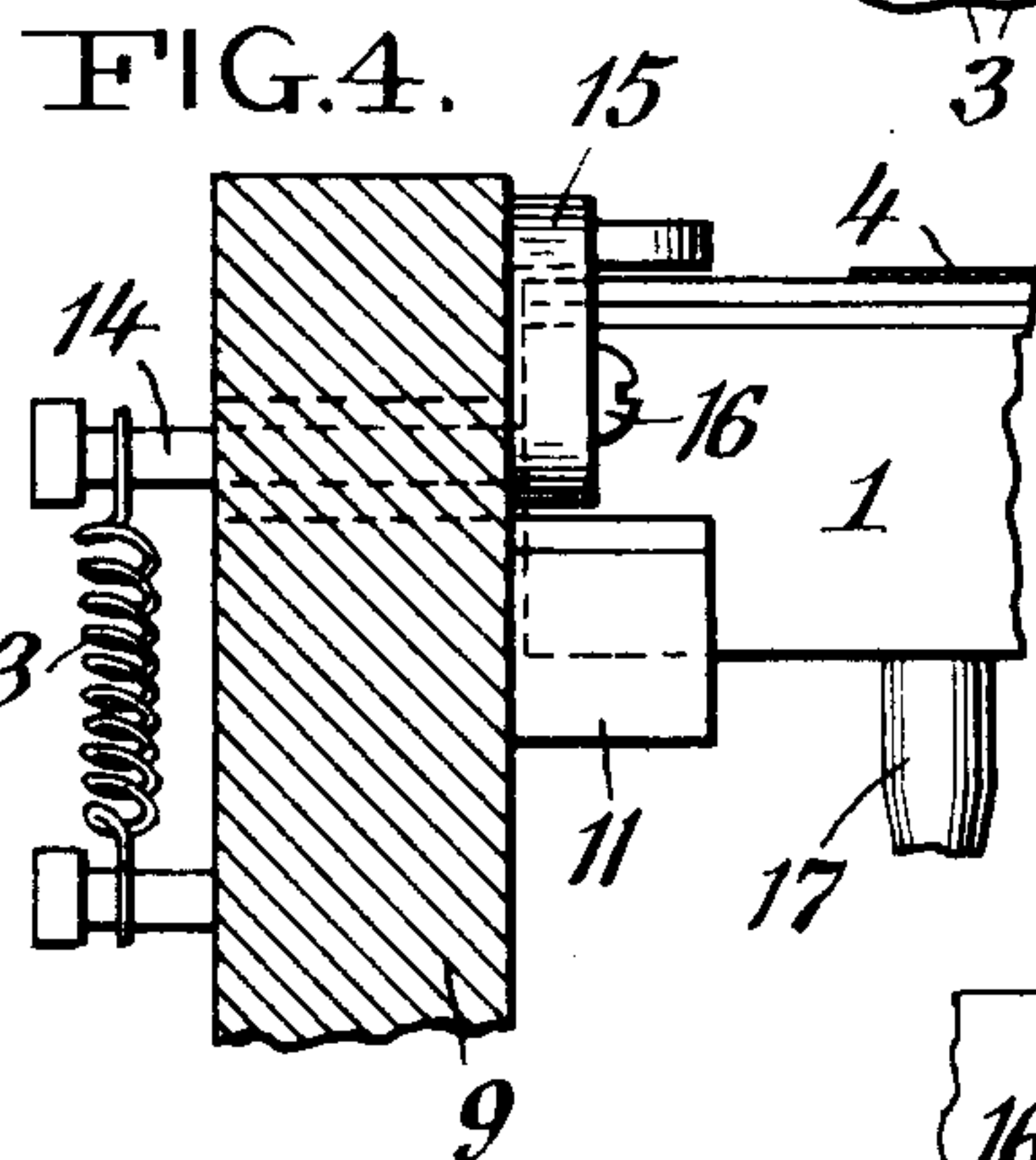


FIG. 4.

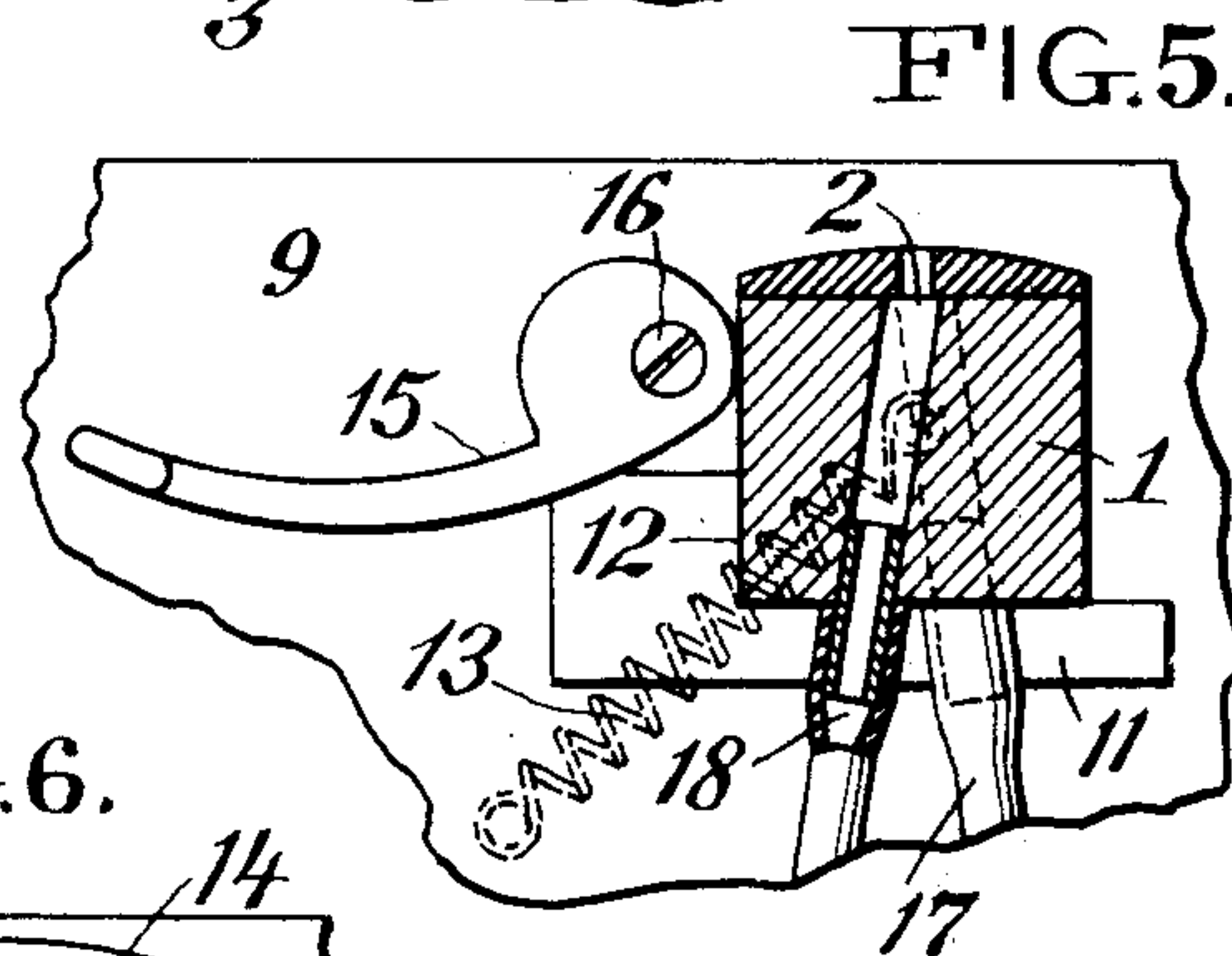


FIG. 5.

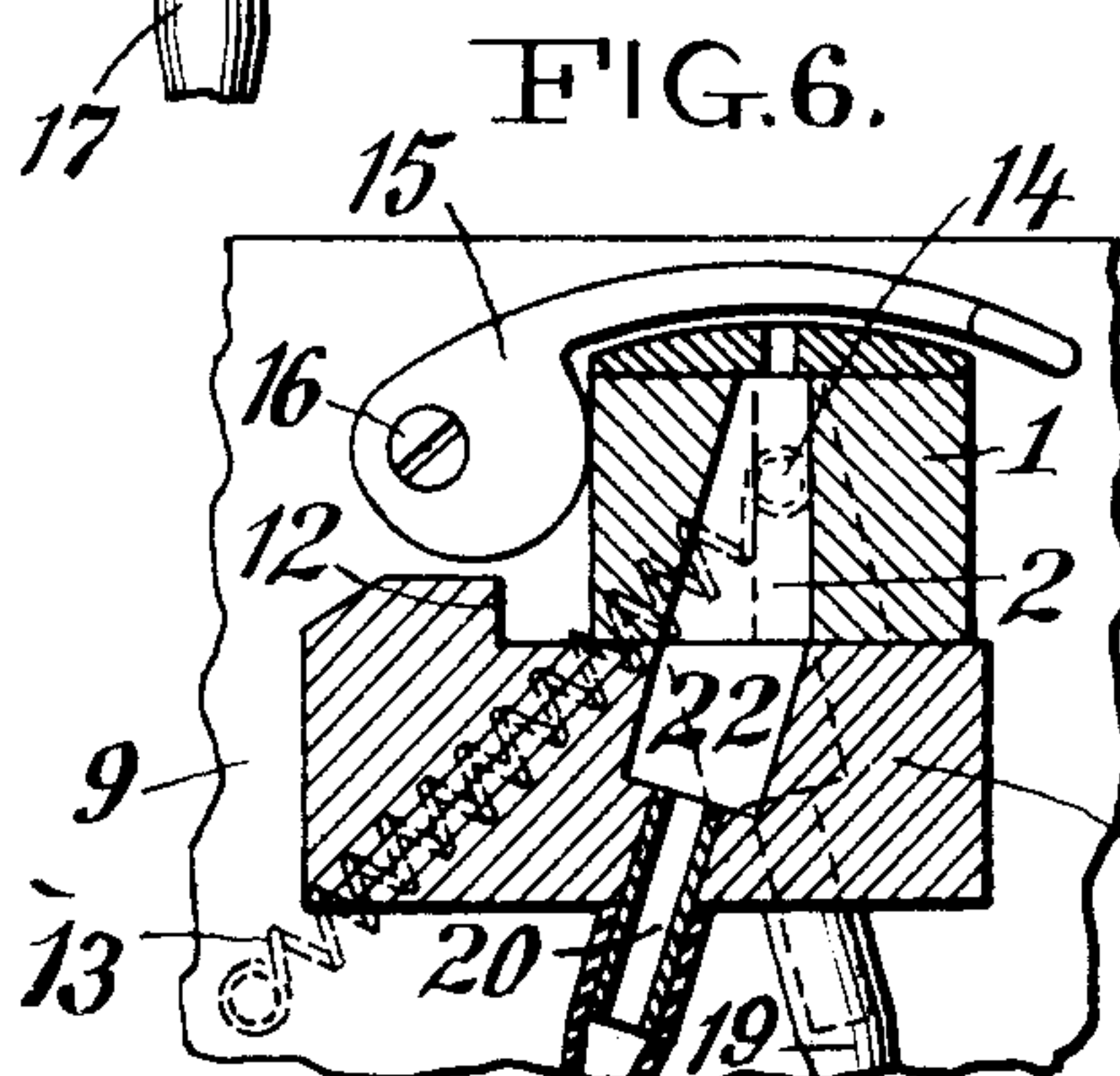


FIG. 6.

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UNITED STATES PATENT OFFICE.

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TRACKER FOR MECHANICAL MUSICAL INSTRUMENTS.

SPECIFICATION forming part of Letters Patent No. 791,441, dated May 30, 1905.

Original application filed October 8, 1904, Serial No. 227,625. Divided and this application filed February 11, 1905, Serial No. 245,175.

To all whom it may concern:

Be it known that I, THOMAS DANQUARD, a citizen of the United States of America, residing at the city of New York, State of New York, have invented certain new and useful Improvements in Trackers for Mechanical Musical Instruments, of which the following is a specification.

This application is a division of my pending application for a patent for "Mechanical musical instruments," filed October 8, 1904, and having Serial No. 227,625.

The herein-described invention relates to that class of devices known as "trackers," over which travels a perforated music sheet or plate to control operation of valve systems or parts influencing the sound-producing devices of a mechanical musical instrument, such as an autopneumatic piano-player or a self-playing piano.

The invention has for its more special object to produce "arpeggio" or broken-chord tone effects at the will of the performer, while providing for coupling the tracker to the controlled valve systems or parts by either rubber or lead tubing commonly used for making such connections. The arpeggio-tone effects are obtainable in a preferred manner by making the tracker movable to permit skewing of its lateral row of air-passages relatively to the line of approach and departure of the slots or perforations of the traveling music sheet or plate.

Another object of the invention is to facilitate quick, sharp, repetition of notes or tones when the slots or perforations of the music sheet or plate have the preferred rounded or convexed ends which promote easy travel of the music-sheet around its delivery and take-up rolls and enhance durability of the sheet. This quick note repetition is obtained by peculiar rounded or concaved formations of the air-passages of the tracker cooperating with the rounded ends of the music-sheet slots or perforations and practically lengthening the bridges between closely-following perforations of the music sheet or plate.

The invention will first be described and

then will be particularly defined in claims hereinafter set forth.

Reference is made to the accompanying drawings, forming part of this specification, and in which—

Figure 1 is a plan view of the improved tracker with music-sheet rolls and roll-driving mechanism adapted more particularly for a piano-player and showing the tracker at skewed adjustment to produce arpeggio-tone effects. Fig. 2 is an enlarged detail plan view of portions of the tracker and music-sheet, showing the improved tracker-passages. Fig. 3 is a plan view showing another form of said passages. Fig. 4 is an enlarged detail vertical sectional view taken on the line *aa* in Fig. 1. Fig. 5 is a vertical sectional view of a one-piece tracker having rubber tube connections and adjusted for usual playing, not including arpeggio-tone effects; and Fig. 6 is a detail vertical sectional view showing a two-part tracker with lead or other inelastic tube connections at its fixed base portion and with its movable outer portion or the tracker proper adjusted to produce arpeggio-tone effects.

First referring more especially to Figs. 1, 4, and 5 of the drawings, it will appear that the tracker 1 is provided with a lateral row of passages 2, admitting air to valve or other mechanism controlling striking-pneumatics or other pneumatically-operated parts actuating sound-producing devices when the slots or perforations 3 of the music-sheet 4 register with the tracker-passages. The sheet 4 is unwound from a delivery-roll 5 and is wound upon a take-up roll 6 by suitable gearing including a chain belt 7 and clutch mechanism not requiring further description. Arpeggio-tone effects are assured by moving or adjusting the tracker to arrange its lateral row of air-passages 2 at an angle with the line of travel of the music-sheet slots 3, or, in other words, by moving the tracker to skew its lateral row of air-passages 2 relatively to the line of approach and departure of the music-sheet slots 3. The tracker thus may be made movable in various ways—as, for instance, it may be supported at one end by a lug 8 on the music-roll

frame 9 and a screw or pin 10, passed inward through the tracker into said lug, pivots the tracker thereto. The other bodily-movable end of the tracker is supported on a lug or block 11, held to the music-roll frame 9. Said lug 11 has a shoulder 12, forming a stop to which the tracker is drawn into normal adjustment with its row of passages 2 at right angles to the line of travel of the music-sheet slots 3 by any suitable yielding device. There is shown for this purpose a normally contracting spiral spring 13, held at one end to the music-roll frame 9 and connected at its other end to a pin 14, extending laterally from the end of the tracker through a slot in the frame 9, permitting necessary motion of the pin. The spring 13 is set at an angle, so that it also draws the tracker down snugly to its seat-lug 11. Any approved devices may be used to adjust the tracker 1 to the skewed position. A simple and efficient device for the purpose is a cam 15, fulcrumed by a screw or pin 16 to the roll-frame 9. When this cam is swung forward, as shown in Fig. 5 of the drawings, the spring 13 draws the connected end of the tracker 1 rearward to the stop-shoulder 12 on the lug 11, and the lateral row of tracker-passages 2 then range at right angles to the line of travel of the music-sheet slots 3 to produce the usual tone effects. When the cam 15 is thrown over rearward, as shown in Figs. 1 and 4 of the drawings, its eccentric head will force that end of the tracker 1 over to skew the tracker, as more clearly shown in Fig. 1 of the drawings, and thereby cause the music-sheet slots 3 to operate relatively to the tracker-passages 2 to assure arpeggio-tone effects ranging from the bass to the treble. The tracker may be pivoted at the other end to have the arpeggio-tone effects range from treble to bass, or the tracker may be pivoted at any point between its ends, permitting it to assume a skewed position. Practice has demonstrated that skewing the tracker does not seriously interfere with the safe and proper travel of the music-sheet over it from one roll to the other.

When rubber or other elastic or flexible air-tubes 17 are used to connect the tracker-passages 2 with the usual or any approved pneumatic devices influencing the sound-producing devices, said tubes are preferably fitted to nipples 18, fixed in the tracker itself, as shown in Figs. 4 and 5 of the drawings. Such tube connections readily yield as the tracker 1 is moved to give it the skewed position or to return it to normal position. When lead or other inelastic tubes 19 are used, they will be fitted to nipples 20, fixed in a stationary tracker-base 21, having the stop-shoulder 12 and on which base-plate the tracker 1 closely rests and moves. The tracker 1 is here made thinner, and its air-passages 2 are flared downward, so as always to register with all the passages 22 in the tracker-base 21, to which

the tubes 19 are coupled, and as sufficiently shown in Fig. 6 of the drawings. Whether the air-tubes be connected directly to the tracker 1 or to its relatively stationary base 21, it is obvious that the tracker may almost instantly be adjusted to skewed position and may as quickly be readjusted to normal position by simply operating the cam 15. Hence short or long passages of music for which arpeggio-tone effects are desired may be so rendered at any time without puzzling or inconveniencing the performer. Fig. 1 of the drawings clearly indicates that arpeggio or broken-chord tone effects are produced by the gradual advance of all the slots or perforations 3 in the same lateral line of the music-sheet to successively open the tracker-passages 2 from left to right or from the bass toward the treble during rolling out of the tones.

Figs. 2 and 3 of the drawings more clearly show that the tracker-passages 2 may be concaved at 23 at the edge toward which the music-sheet slots 3 approach or may be concaved at 24 at the opposite edge from which these slots depart. The tracker-passages may be concaved at one edge only or at both edges, as may be desired. The advantage of concaving the tracker-passage at 23 is that the advancing music-sheet slot 3 in presenting its rounded forward end to the passage 2 will assure more prompt full entrance of air through the sheet-slot 3 and passage 2, and thus will more promptly operate the communicating valves and striking-pneumatics than would be possible if the rear edge of the tracker-passage were straight, as shown in Fig. 3 of the drawings. A more decided advantage is obtained by concaving the front edges of the tracker-passages at 24, as shown in both Figs. 2 and 3 of the drawings, because the departing rounded end of the sheet-music slot 3 will very quickly leave the entire area of the tracker-passage 2, and therefore will promptly cut off air-supply to the valves to permit the striking-pneumatics to very quickly recover themselves after each collapsing or effective stroke operating a sound-producing device. In the drawings the tracker-passages are shown wider than normal for convenience of illustration, but in practice the passages, having either one or both edges concaved, will have an area no larger than the rectangular or parallel-edged passages of ordinary trackers. Concaving the tracker-passages, as above described, by assuring very prompt action of the striking-pneumatics serves practically to lengthen the bridge at 25 between successive closely-arranged slots or perforations 3 of the music-sheet, and therefore facilitates and much improves repetition of the produced tones, especially during quick tempo of the music.

Trackers have heretofore been made with rectangular air-passages cooperating with rectangular slots or perforations of a music-sheet and permitting quick note repetition, and

music-sheets having slots or perforations formed with rounded or concaved ends have heretofore been used with trackers having rectangular air-passages not permitting quick
 5 note repetition. This invention is therefore limited in this respect to the use of a tracker having concaved air-passages cooperating with rounded or convexed ends of the music-sheet slots or perforations for assuring quick
 10 note repetition while facilitating easy travel of the music-sheet over the tracker, and also assuring that the rounded ends of the music-sheet slots always act properly or accurately with the concaved tracker-passages to obtain quick
 15 note repetition when the tracker-passages range at right angles with the line of travel of the music-sheet slots during ordinary playing or when the tracker is skewed to obtain the above-described arpeggio-tone effects.

20 Various modifications of this invention may be made by the skilled mechanic within the scope of the appended claims—as, for instance, instead of making the tracker movable, so as to skew its lateral row of air-passages relatively to the line of travel of the
 25 music-sheet slots, the arpeggio-tone effects may be produced in a more complex and less desirable manner by using a relatively fixed tracker and making both music-rolls movable
 30 to parallel inclined positions, so as to have the lateral row of air-passages of the tracker skewed relatively to the line of travel of the slots or perforations of a music-sheet passing over the tracker from one music-roll to the
 35 other.

I claim as my invention—

1. A tracker for mechanical musical instruments, having its lateral row of air-passages skewed relatively to the line of travel of the
 40 music-sheet slots.

2. A tracker for mechanical musical instruments, made movable or adjustable to set its lateral row of air-passages normally at right angles to the line of travel of the music-sheet
 45 slots, or to skew its row of air-passages relatively to the line of travel of said slots.

3. A tracker for mechanical musical instruments, made movable or adjustable to set its lateral row of air-passages normally at right angles to the line of travel of the music-sheet
 50 slots, or to skew its row of air-passages relatively to the line of travel of said slots, combined with a stop assuring normal adjustment of the tracker.

55 4. A tracker for mechanical musical instruments, made movable or adjustable to set its lateral row of air-passages normally at right angles to the line of travel of the music-sheet slots, or to skew its row of air-passages relatively to the line of travel of said slots, combined with a stop assuring normal adjustment of the tracker, and means effecting skewed
 60 adjustment of the tracker.

5. A tracker for mechanical musical instruments, made movable or adjustable to set its

lateral row of air-passages normally at right angles to the line of travel of the music-sheet slots, or to skew its row of air-passages relatively to the line of travel of said slots, combined with a stop assuring normal adjustment
 70 of the tracker, and means yieldingly holding the tracker to said stop.

6. A tracker for mechanical musical instruments, made movable or adjustable to set its lateral row of air-passages normally at right
 75 angles to the line of travel of the music-sheet slots, or to skew its row of air-passages relatively to the line of travel of said slots, combined with a stop assuring normal adjustment of the tracker, means yieldingly holding the
 80 tracker to said stop, and means effecting skewed adjustment of the tracker.

7. A mechanical musical instrument having a tracker pivoted for the purposes herein set forth.

8. A mechanical musical instrument having a tracker pivoted at one end, for the purposes herein set forth.

9. A mechanical musical instrument having a pivoted tracker, and a stop to which the
 90 tracker is movable on its pivot for holding its lateral row of air-passages normally at right angles to the line of travel of the music-sheet slots.

10. A mechanical musical instrument having
 95 a pivoted tracker, a stop to which the tracker is movable on its pivot for holding its lateral row of air-passages normally in the line of travel of the music-sheet slots, and means yieldingly holding the tracker to said
 100 stop.

11. A mechanical musical instrument having a pivoted tracker, means holding the tracker normally and yieldingly with its lateral row of air-passages at right angles to the
 105 line of travel of the music-sheet slots, and means adjusting the tracker on its pivot to skew its row of air-passages relatively to the line of travel of the music-sheet slots.

12. A tracker for mechanical musical instruments, made in two relatively movable
 110 parts having registering air-passages, one part being adapted to receive inelastic tube connections to the playing mechanism, and the other part being movable to skew the lateral
 115 row of air-passages relatively to the line of travel of the music-sheet slots, or to hold said row of air-passages at right angles to the line of travel of said slots, while maintaining windway through the tracker-passages.

13. A tracker for mechanical musical instruments, having its air-passages concaved at the edges next the approaching ends of the music-sheet slots.

14. A tracker for mechanical musical instruments, having its air-passages concaved at the edges next the departing ends of the music-sheet slots.

15. A tracker for mechanical musical in- 130

struments, having its air-passages concaved at opposite edges next the approaching and departing ends of the music-sheet slots.

16. In a mechanical musical instrument, 5 the combination with the rolls 5, 6, and means operating them, of a slotted music-sheet 4, and a tracker 1 interposed between the rolls 5, 6, and pivoted at one end at 10, a support 11 for the tracker having a stop 12, and a 10 spring 13 normally holding the tracker to said support and stop.

17. In a mechanical musical instrument, the combination with the rolls 5, 6, and means operating them, of a slotted music-sheet 4, a 15 tracker 1 interposed between the rolls 5, 6, and pivoted at one end at 10, a support 11 for the tracker having a stop 12, a spring 13 normally holding the tracker to said support and stop, and a cam-lever 15 adapted to move the

tracker from the stop 12 and hold the row of 20 tracker-passages in skewed relation to the line of travel of the music-sheet slots.

18. In a mechanical musical instrument, the tracker made in two parts 1, 21; said part 21 being relatively stationary and adapted for 25 attachment of inelastic air-conduits 19 leading to the playing mechanism, and the part 1 being movable on the part 21 to skew the row of tracker-passages 2 relatively to the line of travel of the music-sheet slots; said parts 1, 30 21, having passages 2, 22, maintaining wind-way through the tracker and conduits 19 to the playing mechanism.

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Witnesses:

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