

No. 633,226.

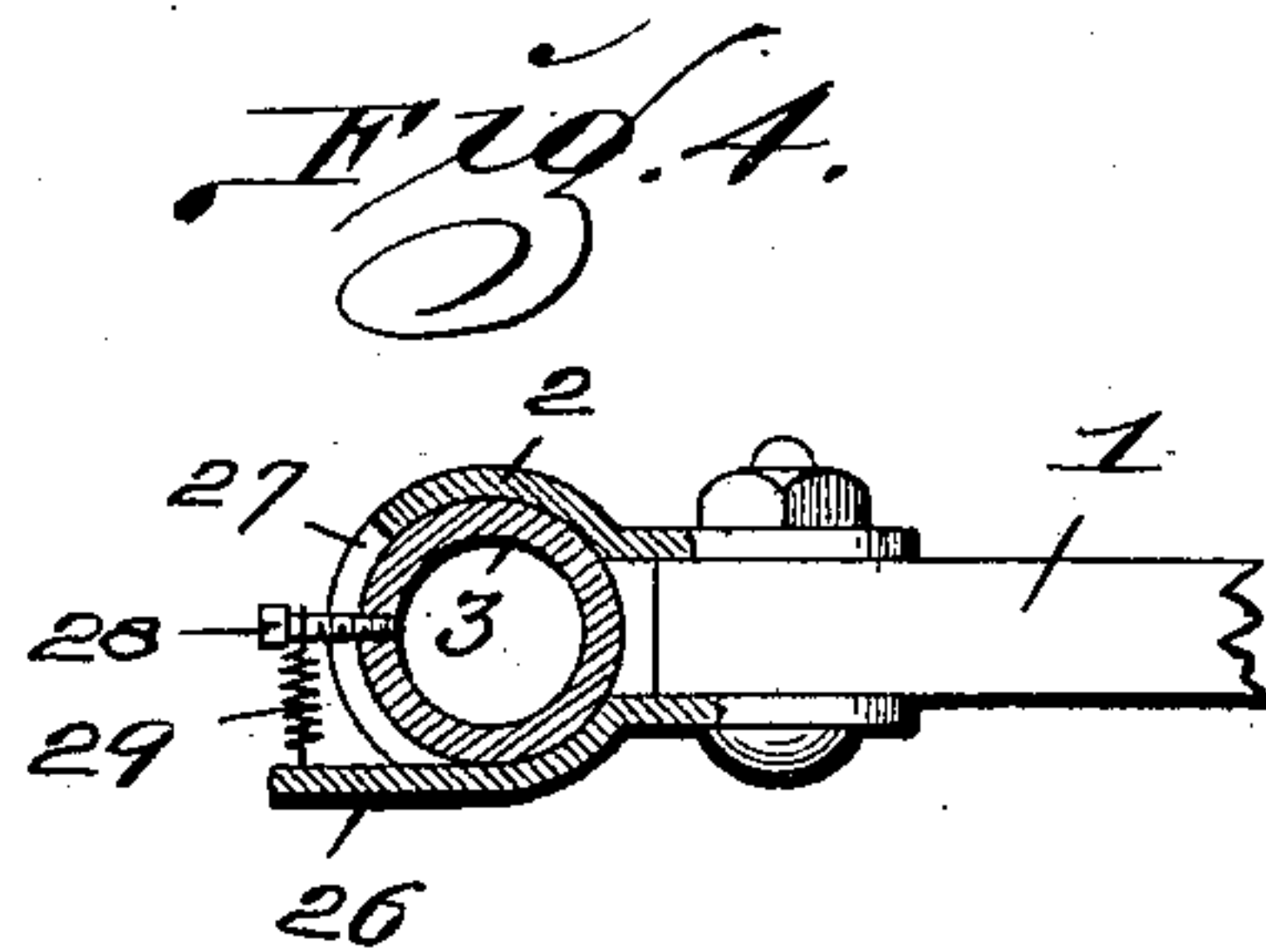
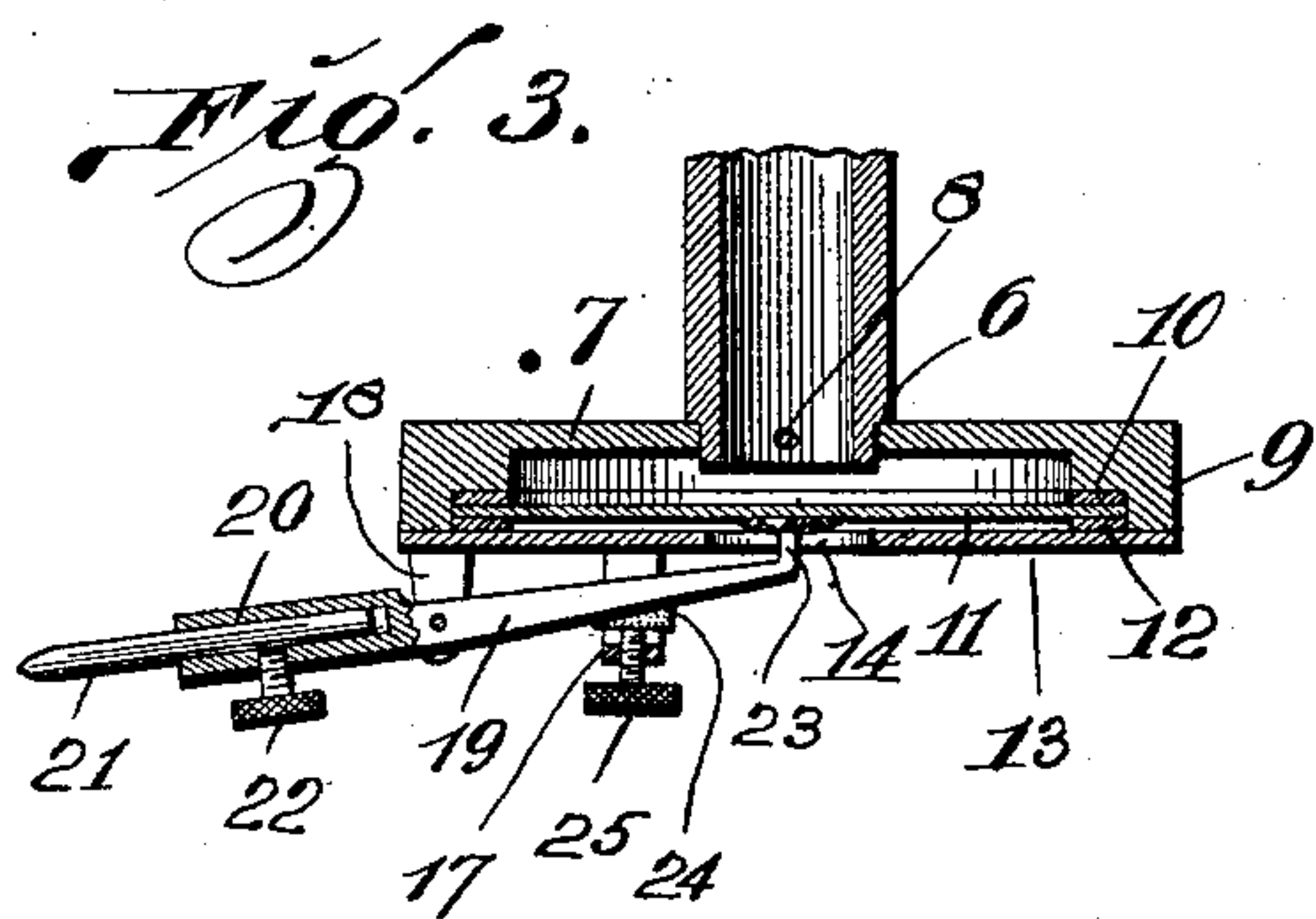
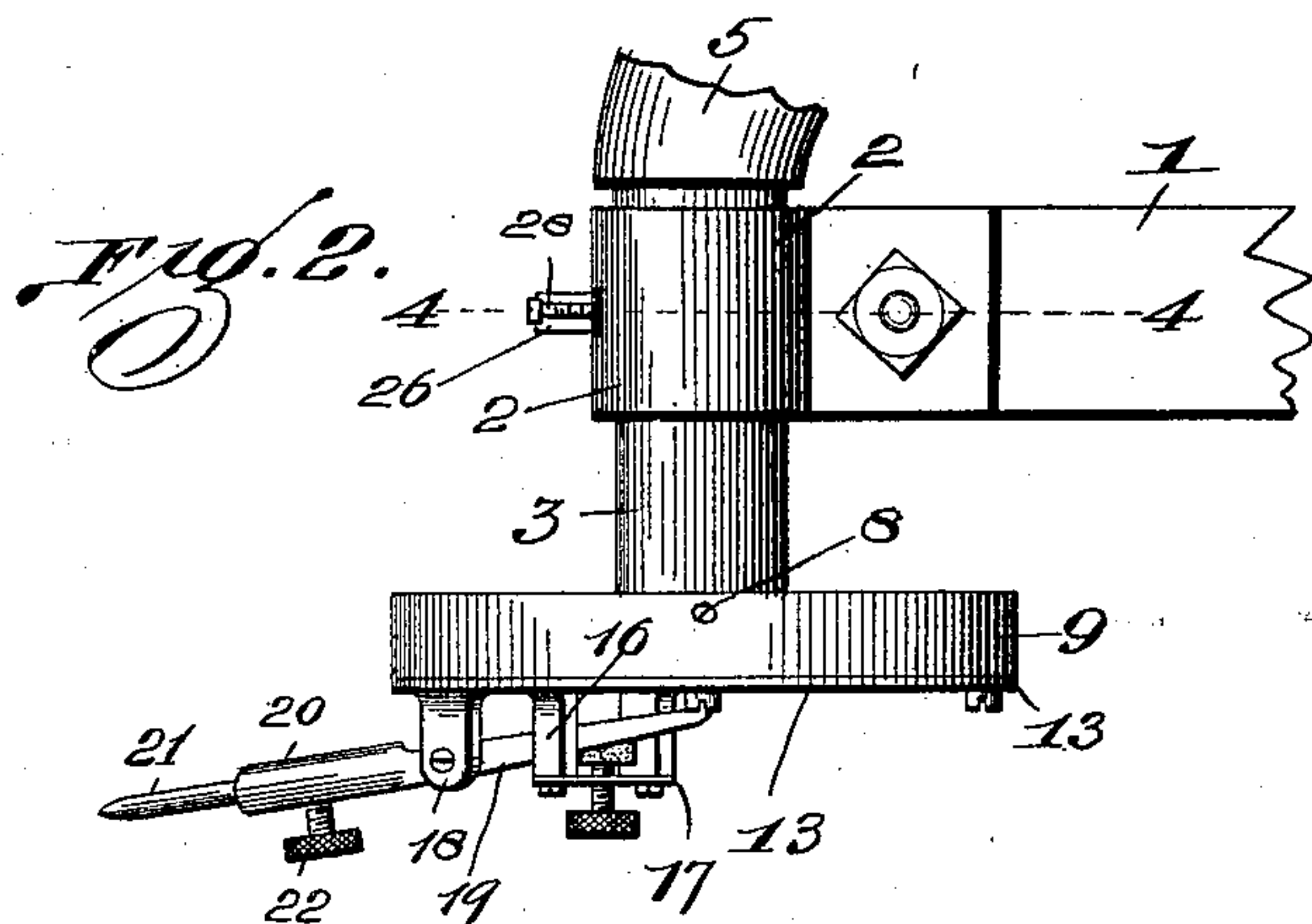
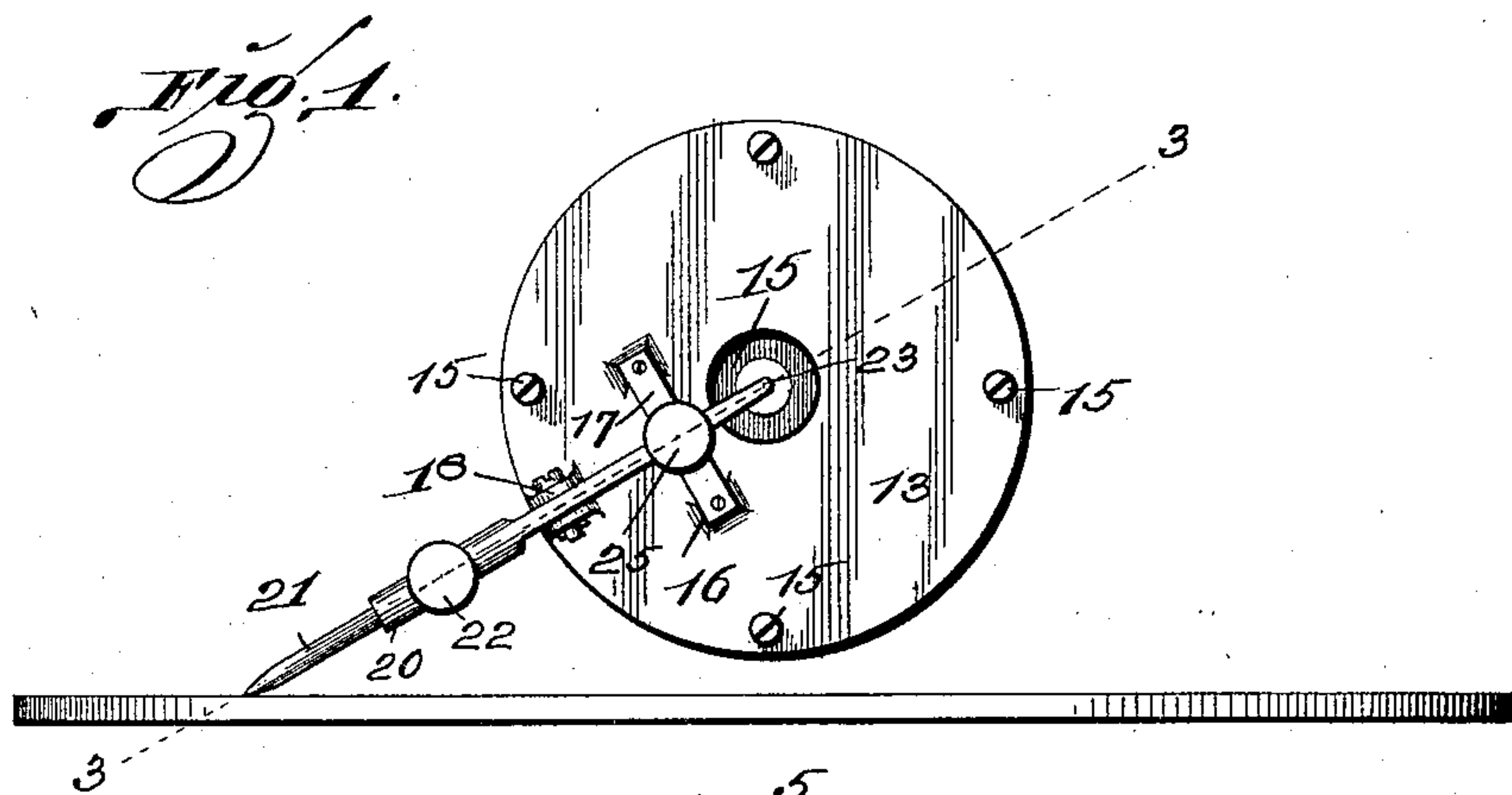
Patented Sept. 19, 1899.

A. BETZOLD.

SOUND REPRODUCER FOR TALKING MACHINES.

(Application filed May 18, 1898.)

(No Model.)



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# UNITED STATES PATENT OFFICE.

ADOLPH BETZOLD, OF ST. LOUIS, MISSOURI, ASSIGNOR OF TWO-THIRDS TO  
THEODORE THORWEGEN AND THEODORE FLACK, OF SAME PLACE.

## SOUND-REPRODUCER FOR TALKING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 633,226, dated September 19, 1899.

Application filed May 18, 1898. Serial No. 681,040. (No model.)

*To all whom it may concern:*

Be it known that I, ADOLPH BETZOLD, of the city of St. Louis, State of Missouri, have invented certain new and useful Improvements in  
5 Sound-Reproducers for Talking-Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

My invention relates to sound-reproducers  
10 for talking-machines; and it consists of the novel construction, combination, and arrangement of parts hereinafter shown, described, and claimed.

Figure 1 is a front elevation of my improved  
15 sound-reproducer, the same being shown in position relative to one of the record-disks. Fig. 2 is a plan view of the reproducer seen in Fig. 1. Fig. 3 is a horizontal sectional view taken approximately on the line 3 3 of Fig. 1. Fig.  
20 4 is a detail sectional view taken approximately on the line 4 4 of Fig. 2 and showing a modified form of the connection between the reproducer and the arm that carries the same.

25 My improved sound-reproducer is especially applicable for machines using flat record-disks, though the same principle, with slight variation in construction, may be used in reproducers for machines using record-cyl-  
30 inders.

In the construction herein shown the wooden arm 1 is provided on its outer end with a collar 2, in which is horizontally arranged a short tube 3, with the outer end of  
35 which connects the horn or trumpet 5, that discharges the sounds reproduced by my improved device. The opposite end of the tube 3 from the end on which the trumpet connects is reduced in diameter to form a shoulder 6, and upon this reduced end is removably lo-  
40 cated a disk 7 of any suitable material, there being a pin or screw 8 passed vertically through said disk and through the reduced end of the tube 3. Formed integral with the  
45 front face and edge of this disk 7 is a flange 9, in the inner edge of which is formed a continuous recess 10. Within this recess is located a diaphragm 11, of mica, glass, parch-  
50 ment, or analogous material, the edges thereof being held between two packing-rings 12, and said packing-rings and said diaphragm are

held in the recess 10 by means of a disk 13, equal in circumference to that of the disk 7, said disk 13 being held upon the face of the flange 9 by means of screws 15 or in any suit- 55  
able manner. Formed through the center of this disk 13 is an aperture 14, and located upon the face of said disk, at a slight distance from said aperture 14 on opposite sides there-  
60 of, are the integral lugs 16, there being a plate 17 located upon the outer ends of said lugs and held thereto in any suitable manner.

Formed integral with the outer edge of the disk 13 at a point in alinement with the center of said disk and between the lugs 16 is a 65  
second pair of lugs 18, between the outer ends of which is fulcrumed an arm 19, the outer end of which is formed into a tube 20, which carries the reproducing-needle 21, said needle being held in said tube 20 by means of the set- 70  
screw 22. The inner end of this arm 19 is extended inwardly through the aperture 14, said inwardly-turned end 23 being located upon the outer face of the diaphragm 11 and held thereto by means of wax or in any suitable 75  
manner. At the point where the arm 19 passes beneath the plate 17 it is provided with a section of rubber 24 or analogous material, and a set-screw 25 passes through the center of the plate 17 and engages against this section 80  
of rubber, this set-screw providing means for accurately adjusting and regulating the vibrations of the needle, arm, and reproducing-diaphragm.

Extending outwardly from the under side 85  
of the collar 2 is an arm 26, there being a slot 27 formed in the collar immediately above said arm, and extending through this slot 27 into the tube 3 is a pin or screw 28, and a retractile coil-spring 29 connects said pin or screw 90  
with the arm 26. The tendency of this coil-spring is to hold the point of the needle 21 upon the surface of the record-disk. In some instances the disk 7 may be formed integral with the outer end of the tube 3; but much 95  
better results are obtained where said disk and tube are constructed separately and held together by the pin or screw 8.

In the operation of my improved sound-re-  
100 producer the needle is located in the tubular end of the arm 19, and after the disk has been set in motion the point of said needle is placed



upon the surface of said disk, and as said needle travels in the indentations in said disk the sound corresponding to said indentations will be reproduced in the usual manner by the vibrations of the diaphragm 11, and the sound thus reproduced will travel through the tube 3 and be discharged through the trumpet 5, which acts as an amplifier. The cushion 24, of rubber, being loosened or depressed upon the arm 19 by means of the set-screw 25 will readily and accurately adjust and regulate the vibrations of said arm, and consequently the diaphragm 11, and the reproduced sound will therefore be regulated. By thus locating the rubber cushion in position a soft even tone may be produced instead of a hard metallic tone, as heretofore, and all the grating and scratching noises unpleasant to the ear will be eliminated from the reproduced sounds. By properly manipulating the thumb-screw tones ranging from loud to very soft may be produced, even though the record upon the disk be the reverse of the tone desired.

It is preferable that the sound-box comprising the disk 7 and flange 9 be of metal, and it is also desirable that the packing-rings

12 be of some soft material, such as blotting-paper or felt.

A sound-reproducer of my improved construction is simple, will not readily get out of order, can be accurately adjusted, and is applicable for all styles of talking-machines.

I claim—

The improved sound-reproducer for talking-machines, comprising the sound-box, the diaphragm, the disk 13 having the central aperture 14, two lugs or projections 16 extending at right angles from the outer face of said disk, the plate 17 fixed upon the outer ends of said lugs or projections, the needle-carrying arm, the inner end of which is secured to the diaphragm, the rubber cushion 24 seated upon said needle-carrying arm, and the set-screw 25 threaded through said plate 17 and bearing upon said rubber cushion 24, substantially as specified.

In testimony whereof I affix my signature in presence of two witnesses.

ADOLPH BETZOLD.

Witnesses:

EDWARD E. LONGAN,

M. P. SMITH.