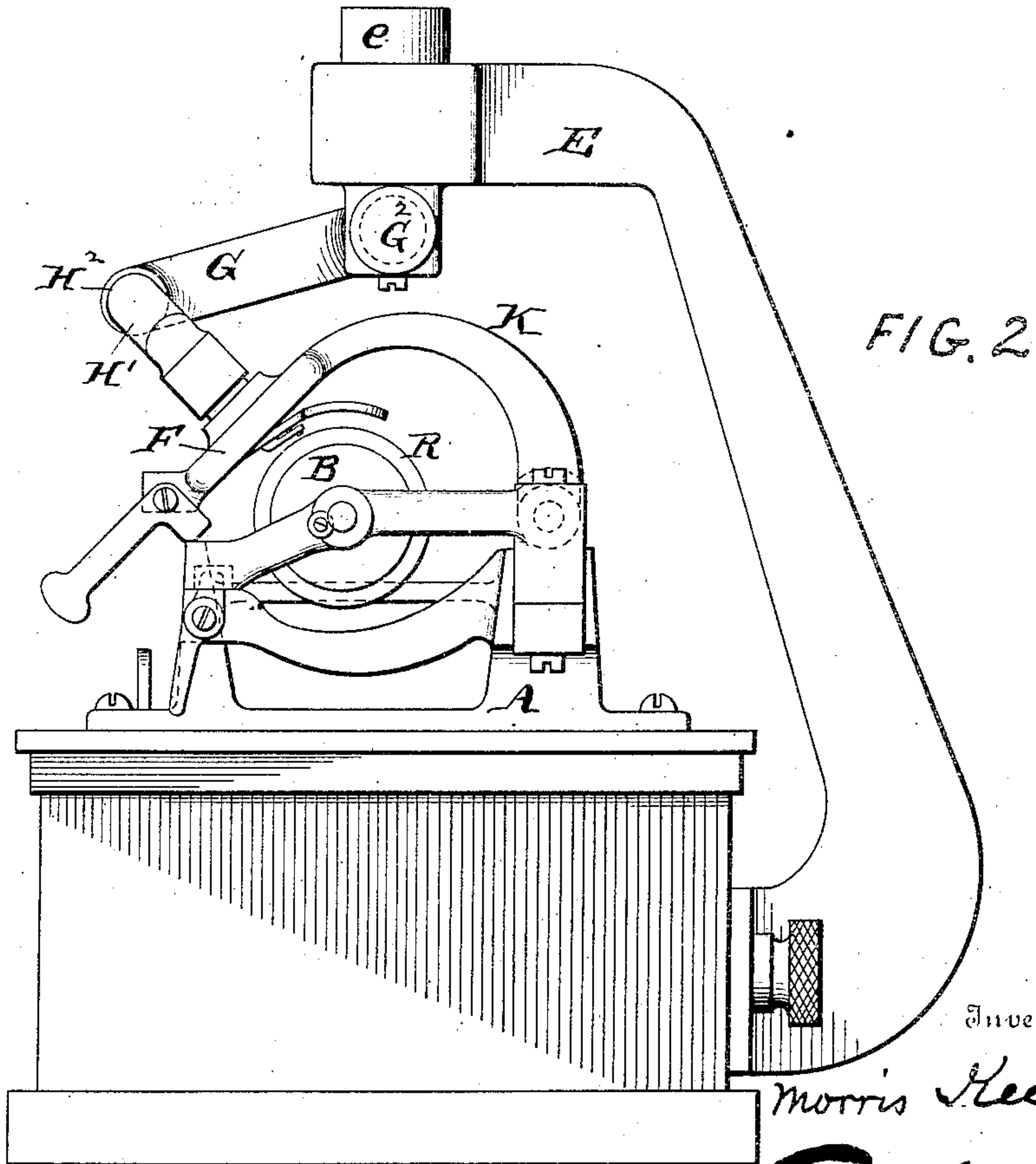
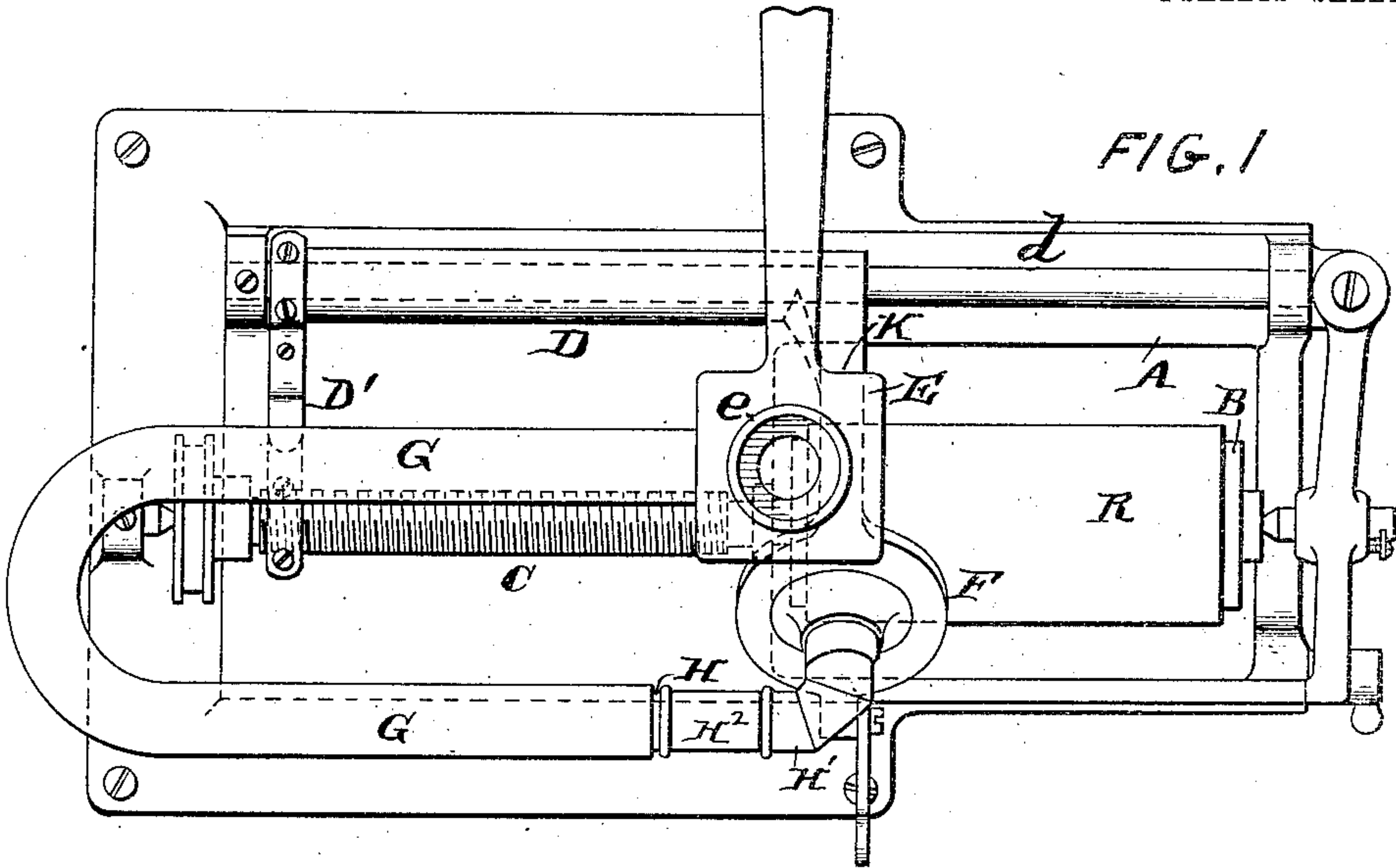


M. KEEN.
SOUND REPRODUCING MACHINE.
APPLICATION FILED APR. 4, 1907.

929,859.

Patented Aug. 3, 1909.

2 SHEETS—SHEET 1.



Witnesses

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A. M. Kelly

By

Inventor

Morris Keen

Attorney

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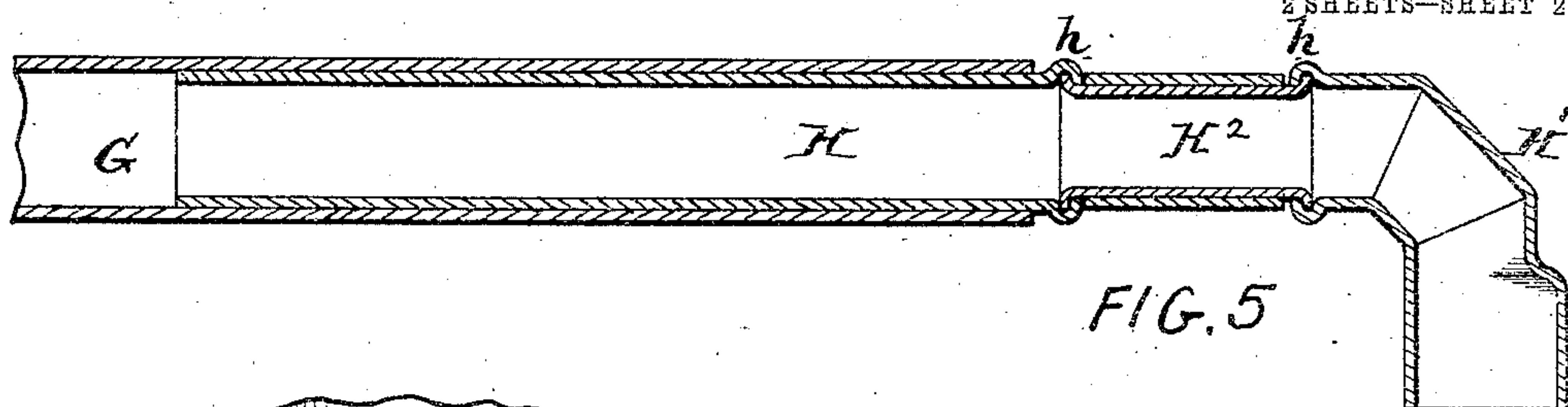


FIG. 5

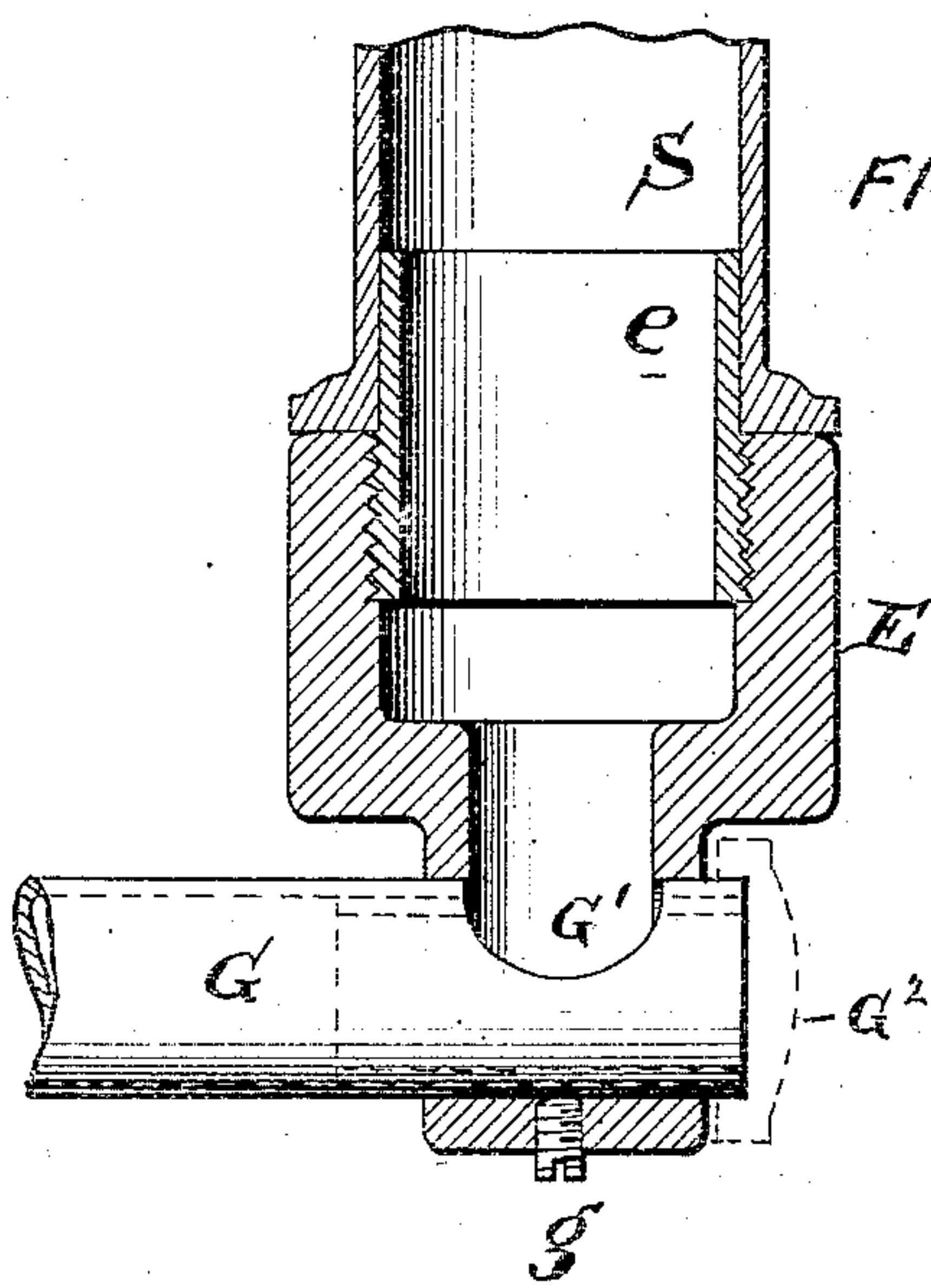


FIG. 4

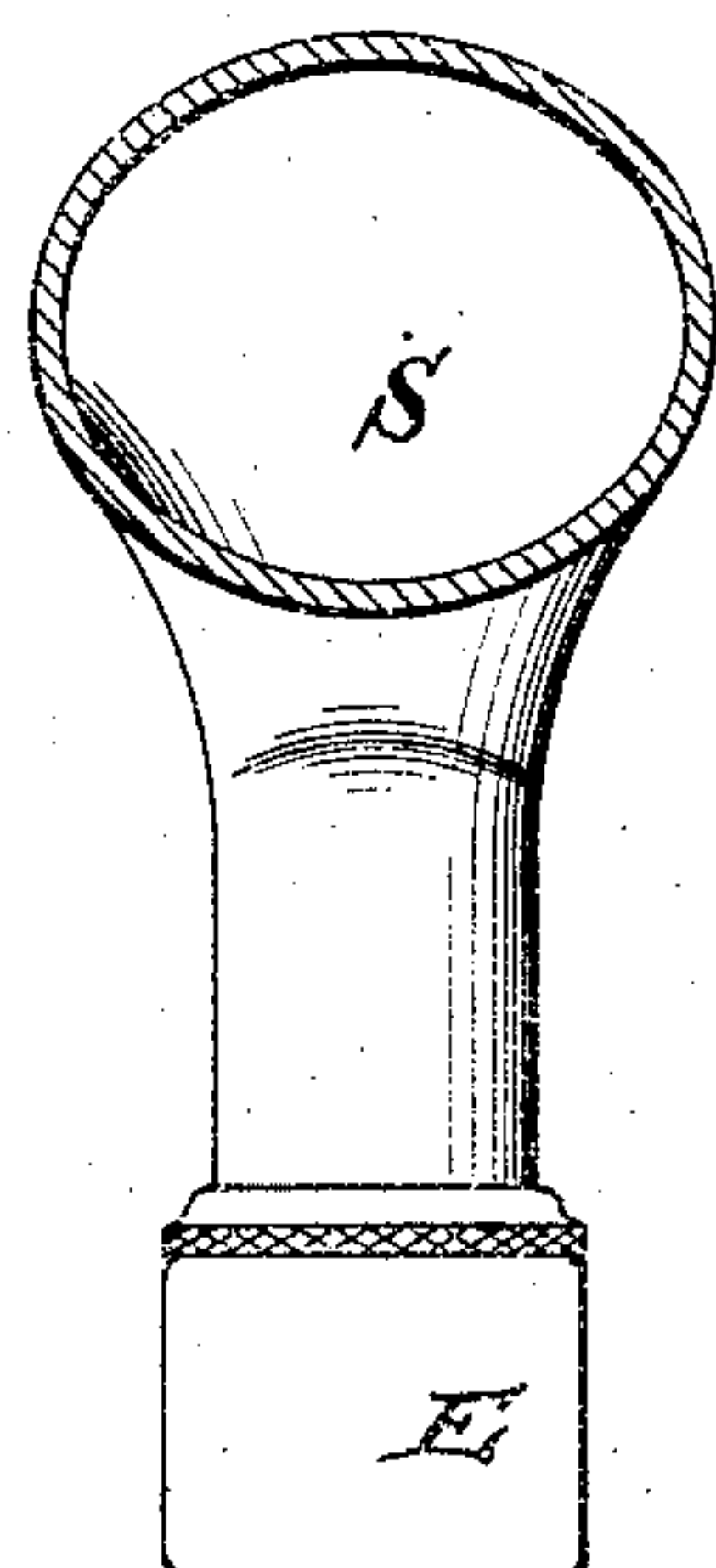


FIG. 6

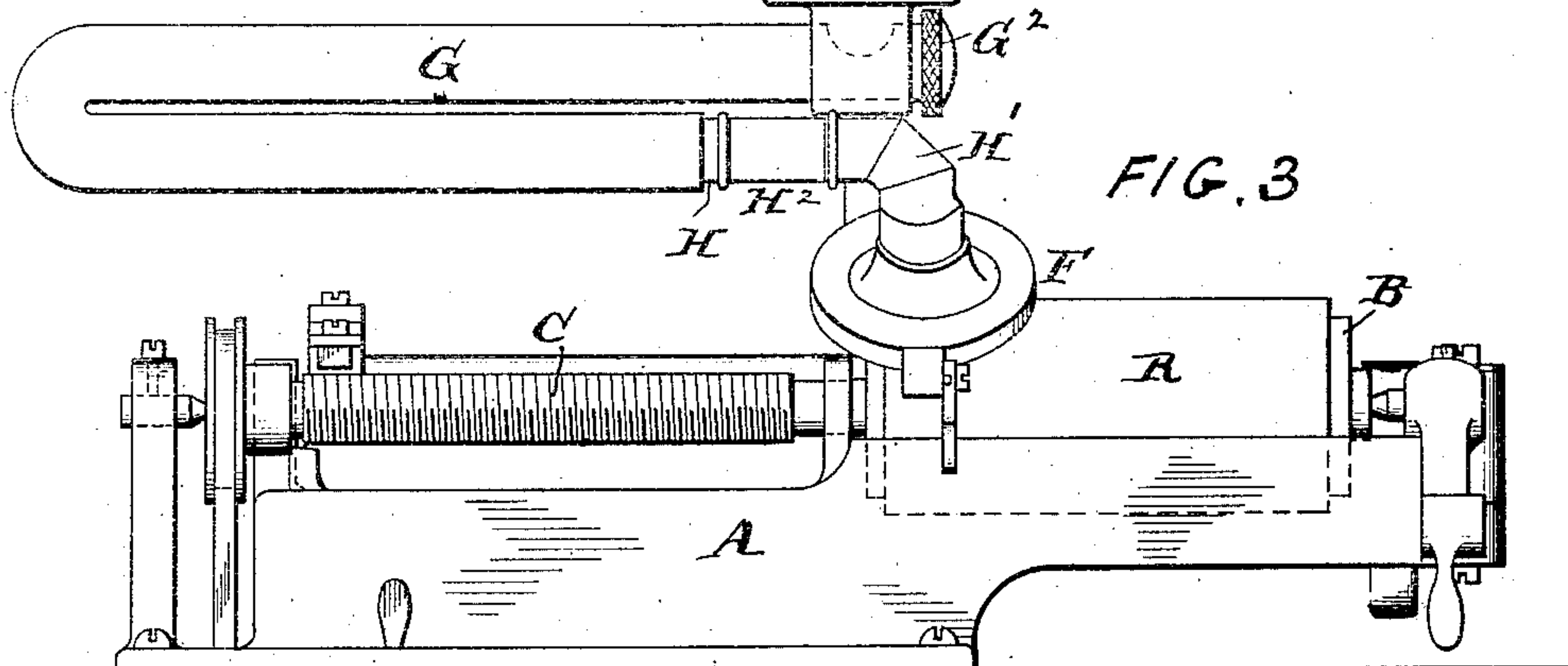
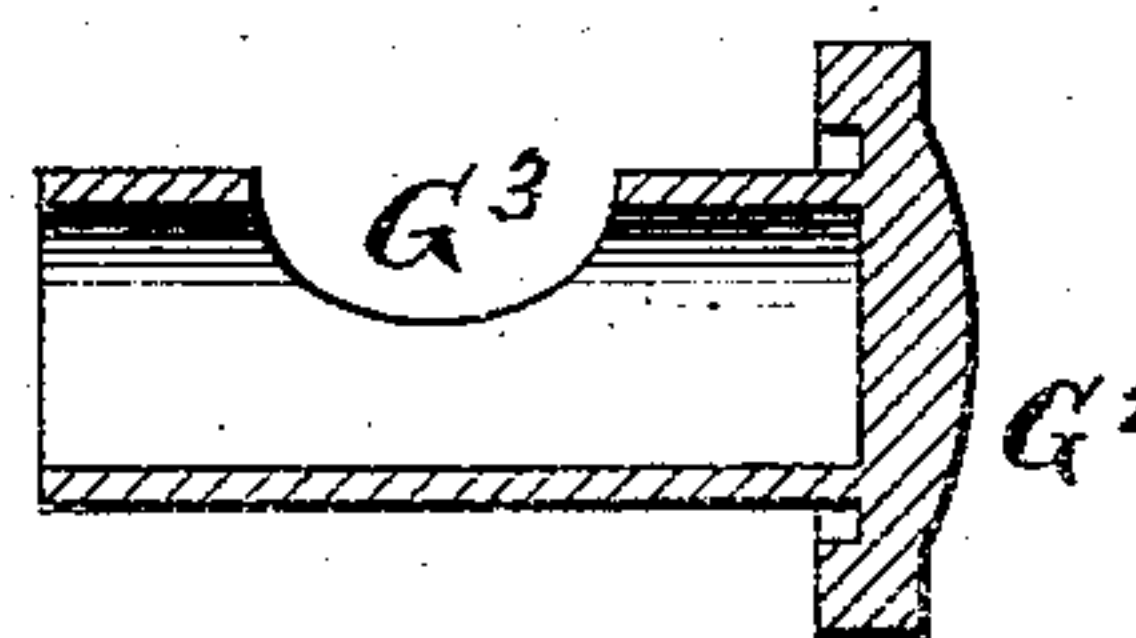


FIG. 3

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[Signature]

Attorney

UNITED STATES PATENT OFFICE.

MORRIS KEEN, OF PHILADELPHIA, PENNSYLVANIA.

SOUND-REPRODUCING MACHINE.

No. 926,360.

Specification of Letters Patent.

Patented Aug. 3, 1909.

Application filed April 4, 1907. Serial No. 366,243.

To all whom it may concern:

Be it known that I, MORRIS KEEN, of the city and county of Philadelphia and State of Pennsylvania, have invented an Improvement in Sound-Reproducing Machines, of which the following is a specification.

My invention has reference to sound reproducing machines and consists of certain improvements which are fully set forth in the following specification and shown in the accompanying drawings which form a part thereof.

The object of my invention is to provide a sound reproducing machine, of the phonograph and graphophone types, with means whereby the sound box or reproducing head may travel longitudinally over the length of the record cylinder and at the same time the distribution of the sound be made by a horn supported in a fixed position, the result being that the weight of the horn is not carried to any extent by the sound box carriage and does not interfere in any way with the operation of the reproducing apparatus. By supporting the horn separately in a machine of this class it may be adjusted at any angle or position. The weight of the horn being removed from the sound box carriage, the latter travels more smoothly and with less power. The adjustment of the machine is more easily effected and in general, the apparatus is more stable and easily manipulated.

My invention consists in providing the phonograph or graphophone instrument with a stationary bracket or arm wholly supporting the horn and combining therewith an adjustable tubular connection between the traveling sound box and the stationary bracket for transmitting the air vibrations to the fixed horn when embodying the general features of construction defined in the claims.

My invention also comprehends details of construction which, together with the features above specified, will be better understood by reference to the drawings, in which:—

Figure 1 is a plan view of a sound reproducing machine embodying my invention; Fig. 2 is an end elevation; Fig. 3 is a front elevation; Fig. 4 is a sectional view showing the connection of the adjustable tubular arm and bracket; Fig. 5 is a sectional view of the adjustable tubular connection or arm; and

Fig. 6 is a cross section of the plug for adjusting the sound opening to the horn.

A is the main frame of the instrument; B is the record tablet drum; C is the driving shaft and feed screw; D is the traveling carriage having the arm D' making engagement with the feed screw and by which the carriage is moved; *d* is the carriage guide; K is the sound box carrying arm extending from the carriage; and F is the sound box or reproducer head which may be of any suitable construction. R is the record cylinder carried by the drum B. These parts are such as are found embodied in phonograph and graphophone instruments now on the market.

Secured rigidly to the base of the machine is a bracket E which extends upward over the upper portion thereof. The upper end of the bracket E is formed with a tubular portion provided at the top with a bushing *e* upon which the base or small end of a horn S is fitted as shown in Figs. 3 and 4. The horn is thus supported in such a manner that its weight is carried wholly by the bracket E. It may also be adjusted about a vertical axis so as to direct the sounds away from the machine as may be desired, the horn having capacity for adjustment throughout 360 degrees.

Supported by the bracket E and communicating with the horn through the aperture in the head of the said bracket, is the goose neck tubular arm G, one arm of which is secured to the bracket and the other end free. The free end of this tubular arm is parallel to the axis of the shaft C and record drum B. Sliding in this tubular arm is a tube H which is connected with the sound box F by an elbow H' attached to the sound box case and a universal joint H² comprising a short tube having a loose flange and groove connection at A with said parts H and H', as clearly shown in Fig. 5. In this manner the movement of the sound box will cause the tube H to slide in the tubular arm G so that at all times in its movement the sound box will be in communication with the fixed horn. It is evident that the essential feature of the construction resides in providing an adjustable tubular connection for the air pulsations between a fixedly supported horn and a rectilinearly movable and positively fed sound box, and hence I do not restrict myself to the particular means herein shown,

it being evident to one skilled in the art that other suitable modified forms of such connections may be employed in lieu of those illustrated.

5 To vary the sound emitted from the horn, I provide a valve or plug G^2 which fits into the end of the tubular part G where it is secured to the head of the bracket. This valve G^2 is formed like a tube, closed at one
10 end and having a lateral opening G^3 adapted to come into alinement with a similar lateral opening G' in the tubular part G within the head of the bracket and below the horn. By rotating the valve or plug G^2 the orifice G'
15 may be more or less throttled to vary the freedom of passage of the air vibrations. In this way the music or sounds may be subdued when desired.

The tubular connection shown, comprising the parts G , H , form a telescopic joint, but other forms of joints or adjustable tubular connections may be employed if so desired.

Having now described my invention, what I claim as new and desire to secure by Letters Patent, is:—

25 1. In a sound reproducing machine, the combination of a rectilinearly movable sound box or reproducer, means for guiding and supporting the said sound box, a bracket
30 having a tubular end, a horn having its weight supported by the bracket but adjustable circumferentially thereon, mechanical devices for positively feeding the sound box relatively to the horn, and an adjustable
35 tubular connection between the sound box and the tubular end of the bracket and formed of a plurality of telescoping members arranged parallel to the line of travel of the sound box, part of said members
40 being secured to the bracket independently of the horn and part of said members being secured to the sound box.

2. In a sound reproducing machine, the combination of a rectilinearly movable
45 sound box or reproducer, means for guiding and supporting the said sound box, a bracket having a tubular end, a horn having its weight supported by the bracket but adjustable circumferentially thereon, and an
50 adjustable tubular connection between the sound box and the tubular end of the bracket consisting of telescoping parts of rigid material, one of which is connected with and supported by the bracket by a
55 goose neck independently of the horn and the other with the sound box and extending therefrom parallel to the line of travel of the sound box.

3. In a sound reproducing machine, the
60 combination of a rectilinearly movable sound box or reproducer, means for guiding and supporting the said sound box, mechanical devices for positively feeding the sound box relatively to the horn, a bracket
65 having a tubular end, a horn having its

weight supported by the bracket but adjustable circumferentially thereon, and an adjustable tubular connection between the sound box and the horn consisting of a fixed tubular part supported by the bracket
70 and having a long tubular part parallel to the travel of the sound box and a sliding straight tubular part telescoping with the fixed tubular part and connected to and moving with the sound box through the
75 medium of a flexible joint.

4. In a sound reproducing machine, the combination of a rectilinearly movable sound box or reproducer, means for guiding and supporting the said sound box, a bracket
80 having a tubular end, a horn having its weight supported by the bracket but adjustable circumferentially thereon, an adjustable tubular connection between the sound box and bracket, and a valve for
85 throttling the sound vibrations arranged in the tubular end of the bracket so as to be fixedly supported during the travel of the sound box.

5. In a sound reproducing machine, the
90 combination of a rectilinearly movable sound box, means to rotate a sound record, means for guiding and supporting said sound box, a fixed support independent of the sound box and also of the horn and
95 having a tubular part, a horn having its weight wholly supported by the fixed support and having its smaller end detachably connected to one end of the tubular part of the said support, and a tubular connection
100 between the sound box and the other end of the tubular part of the support consisting of telescopic sections of rigid material one of which sections is connected with the tubular part of the fixed support and in-
105 dependent of the horn and held in fixed position relatively to the means for rotating the sound record, and the other section connected with the sound box and sliding on the first mentioned fixedly supported section.

6. In a sound reproducing machine, the combination of a fixed horn supporting bracket, a horn wholly supported by and adjustable thereon, a mechanically pro-
110 pelled sound box, and an adjustable tubular connection between the bracket and the sound box consisting of two telescoping parts one of which is stationary and supported by the bracket and the other connected with the sound box and having a long tubular part extending parallel to the direction of travel of the sound box and united to the sound box by a flexible joint to compensate for irregularities in the aline-
115 ment of the parts in operation.

7. In a sound reproducing machine, the combination of a rectilinearly movable sound box or reproducer, means for guiding and supporting the said sound box, a fixed

support having a tubular bearing, a horn
having its weight supported by the bearing
but adjustable circumferentially thereon,
and an adjustable tubular connection be-
5 tween the sound box and the bearing con-
sisting of telescoping parts one of which is
connected with and supported by the bear-
ing independently of the horn and having
a tubular portion fixedly arranged parallel
10 to the line of travel of the sound box and

the other of said parts connected with the
sound box and having a sliding connection
with the tubular portion of the first men-
tioned part.

In testimony of which invention, I have 15
hereunto set my hand.

MORRIS KEEN.

Witnesses:

R. M. HUNTER,

R. M. KELLY.