

No. 773,028.

PATENTED OCT. 25, 1904.

P. A. RASMUSSEN.
MUSICAL INSTRUMENT.
APPLICATION FILED MAR. 26, 1904.

NO MODEL.

2 SHEETS—SHEET 1.

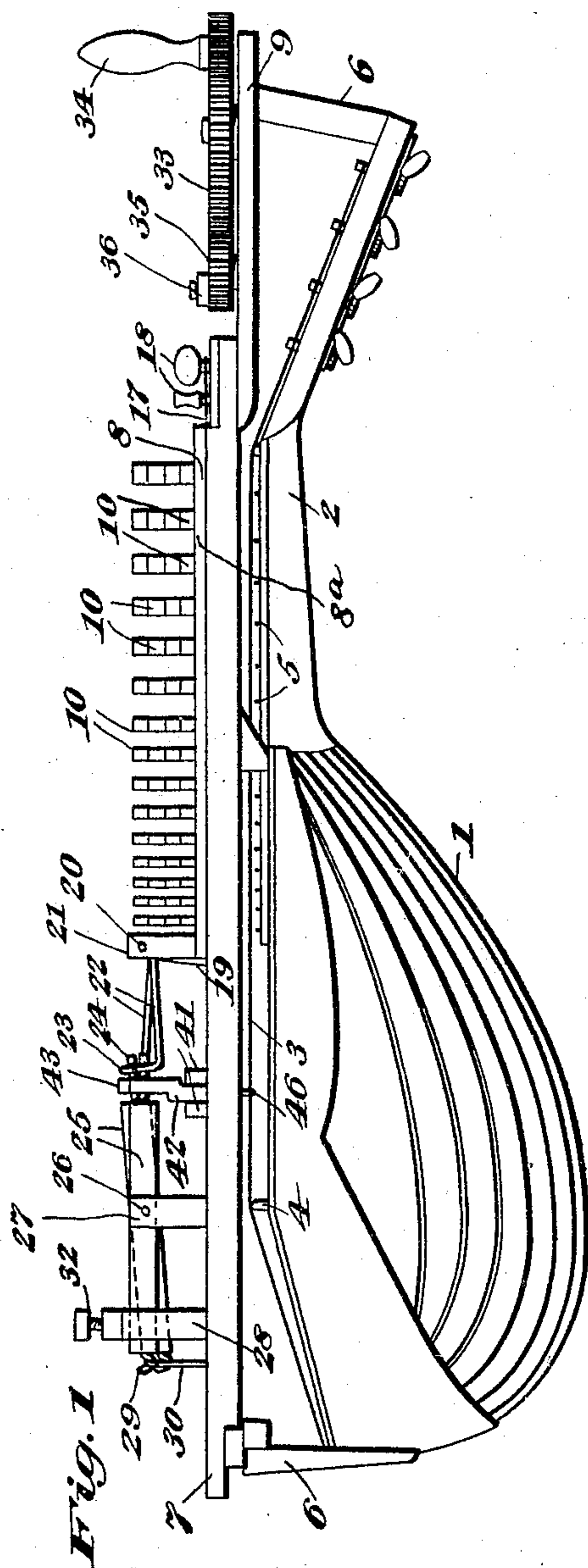


Fig. 1

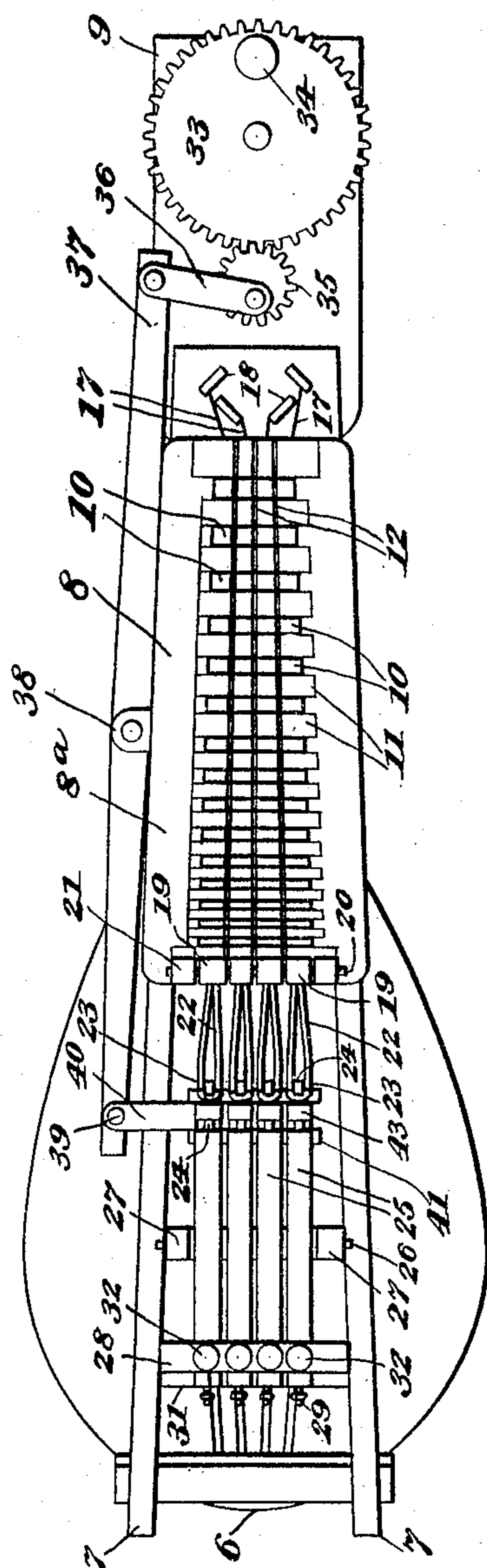


Fig. 2

Witnesses

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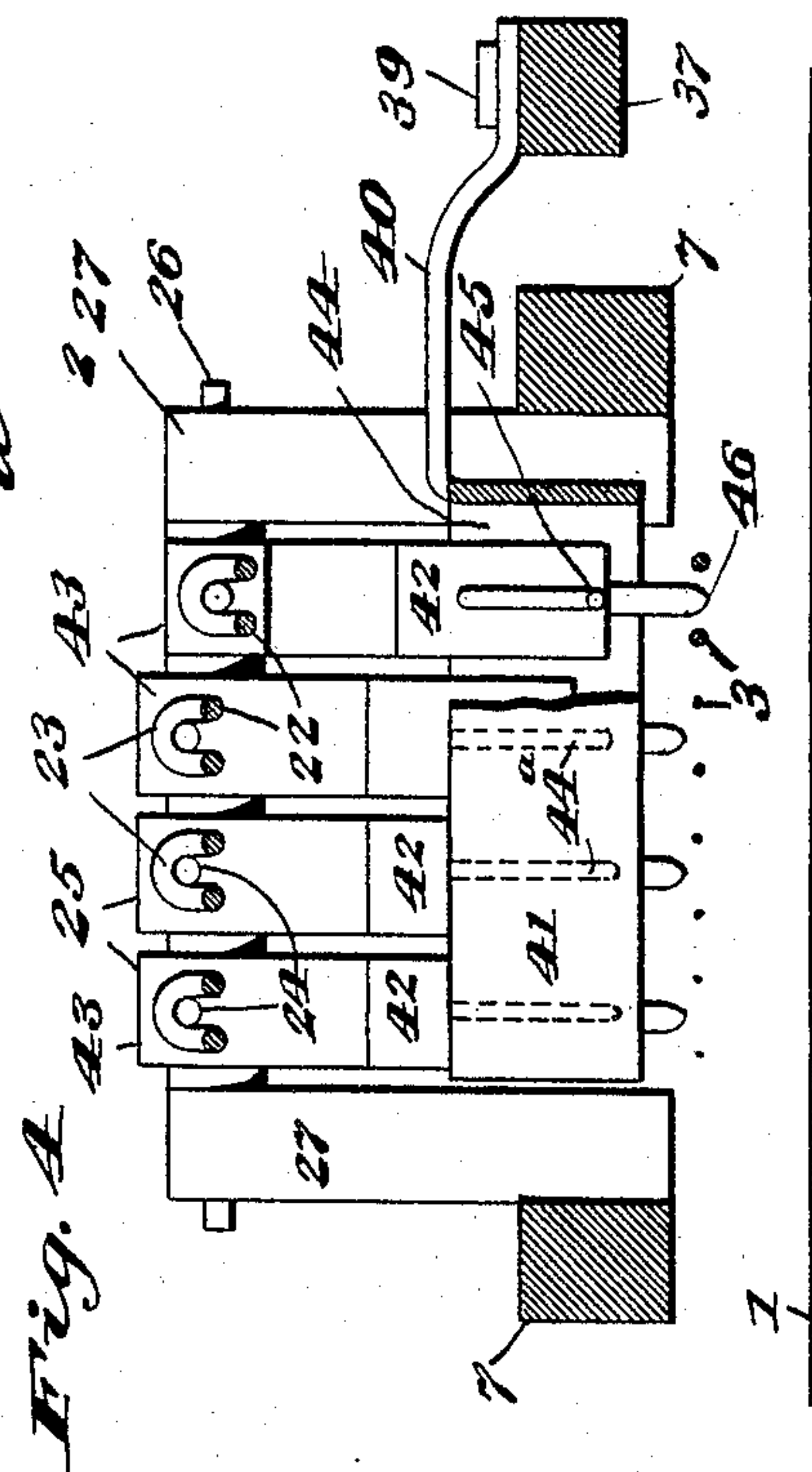
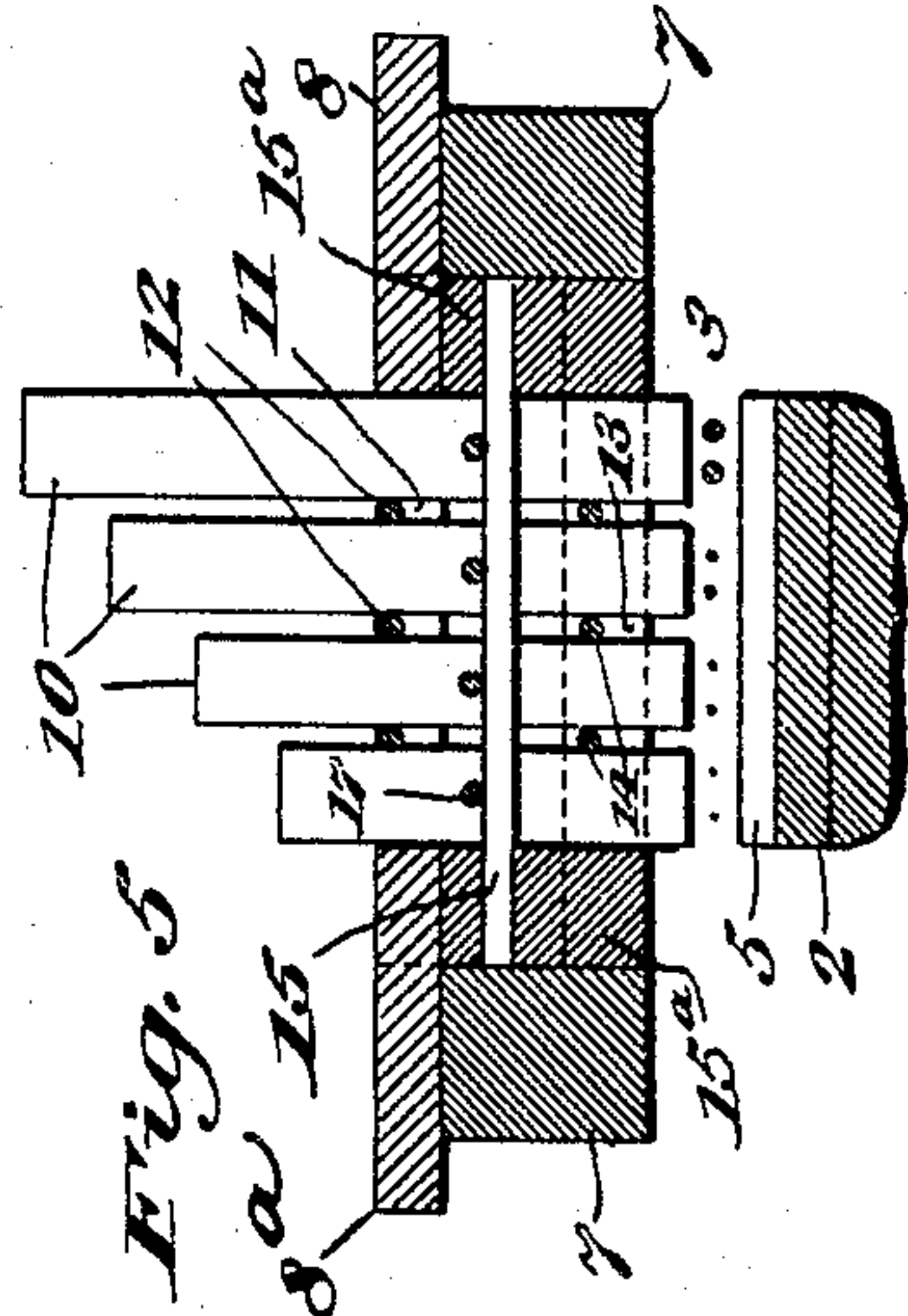
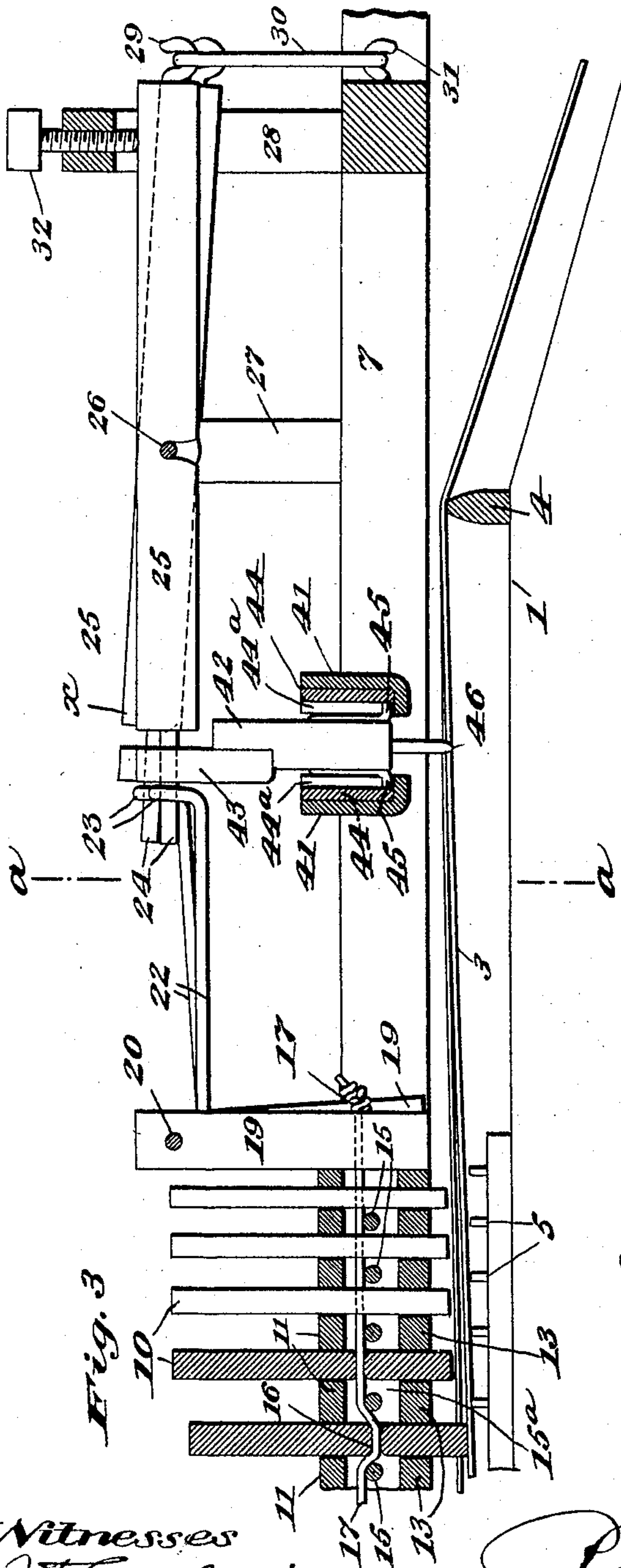
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Witnesses
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UNITED STATES PATENT OFFICE.

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MUSICAL INSTRUMENT.

SPECIFICATION forming part of Letters Patent No. 773,028, dated October 25, 1904.

Application filed March 26, 1904. Serial No. 200,095. (No model.)

To all whom it may concern:

Be it known that I, PETER A. RASMUSSEN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Musical Instruments, of which the following is a specification.

This invention relates to certain improvements in musical instruments, and more particularly in such stringed instruments as are commonly played by means of a pick—as mandolins, banjos, and the like; and the object of the invention is to provide an instrument of this character having mechanical means for playing it, such means being of a simple and inexpensive nature and of a strong and compact construction, such as will greatly facilitate the playing of the instrument, especially by unskilled persons.

The invention consists in certain novel features of the construction, combination, and arrangement of the several parts of the improved musical instrument whereby certain important advantages are attained and the device is rendered simpler, cheaper, and otherwise better adapted and more convenient for use, all as will be hereinafter fully set forth.

The novel features of the invention will be carefully defined in the claims.

In the accompanying drawings, which serve to illustrate my invention, Figure 1 is a side elevation showing a musical instrument provided with my improvements, and Fig. 2 is a top or plan view of the same. Fig. 3 is an enlarged partial section taken lengthwise along the central part of the improved instrument and showing certain features of the fingering and picking devices thereof, as will be hereinafter explained. Fig. 4 is a transverse section taken through the central portion of the instrument in the plane indicated by line *a a* in Fig. 3. Fig. 5 is a transverse section taken through the stem of the instrument and showing certain features of construction of the fingering devices.

In the views, 1 indicates the sounding or body portion of a mandolin to which I have shown my improvements applied herein, although it will be evident that the invention is not limited in its application to this class of

instruments exclusively, but may also be applied with good results to banjos and other similar stringed instruments, and for this reason I do not wish to be understood as limiting myself to the employment of my improvements in connection with mandolins alone.

2 indicates the stem of the instrument, and 3 indicates the strings strained along the stem and body portion 1 and passed over a bridge 4 in a well-known way, while 5 5 indicate the frets for shortening the strings in the ordinary manner for varying the pitch thereof.

At opposite ends of the instrument are erected supports 6 6 of any desired kind, and between these supports and across the top face of the instrument is extended a longitudinal frame comprising side bars 7 7, spaced apart and connected with the support 6 at the base of the body portion 1 of the instrument and connected by means of a casing 8 at the stem of the device, beyond which casing 8 is extended a plate or support 9 for certain actuating means to be hereinafter referred to.

At the casing 8 are arranged four series of fingering devices 10, there being such a series of devices 10 for each of the four pairs or sets of strings 3 and the devices for each pair or set of strings being extended lengthwise of such strings. The devices 10 are adapted for movement in directions at right angles toward the strings 3 and are located at points between the frets 5 5, as indicated in Figs. 1 and 3, so that when said devices are pushed downward toward the stem 2 of the instrument their lower ends will engage upon the underlying strings 3, as indicated in Fig. 3, and will serve to press said strings down upon the frets to shorten the portion of the strings which is free for vibration, and so to vary the pitch of the strings.

In the four series those devices 10 which act between each two adjacent frets 5 5 are alined transversely of the casing 8, as indicated in Figs. 1, 2, and 5, and the devices of the several series being side by side and closely adjacent have their upper ends extended at different levels above the top of the casing 8, each succeeding series of devices being higher above said casing, as indicated in Figs. 1 and 5, so as to render the devices capable of

more ready manipulation by the fingers of the player.

The casing 8 comprises a top plate or finger-board 8^a, which may be removably held in place, if desired, and which is provided with a central opening, across which are extended a plurality of narrow elongated strips or slats 11 11, which intervene in the assembled structure between the transversely-alined devices 10 of the several series and in the upper faces of which are formed alined slots or kerfs 12, wherein are seated wires or metal strips extended across the spaces intervening between the strips or slats 11 and adapted to separate the upper ends of the devices 10, which consist, as indicated on the drawings, of elongated bars or parts of rectangular cross-section, the upper sides of which are adapted to slide freely past the wires or strips in kerfs 12 in the operation of the said fingering devices. The casing 8 also comprises side rails 15^a 15^a, arranged adjacent to and inside of the respective bars 7 7, and between said rails 15^a 15^a, at the lower part of the casing, are extended other slats or strips 13 13 in alinement with the upper slats 11, but separated therefrom, as indicated in Figs. 3 and 5, by a space central in the casing. The slats 13 13 are spaced apart to permit the lower ends of the transversely-alined devices 10 to play between them when said devices are actuated, and in the upper surfaces of said slats 13 are provided slots or kerfs 14 14, similar to the kerfs 12 of the upper slats 11, in which kerfs 14 are also seated wires or metal strips similar to the upper strips in kerfs 12 and likewise extended across the space intervening between the lower slats, so as to separate the lower ends of the devices 10, which in operation play freely past said lower wires or strips.

Across the central space or chamber of casing 8 and between each two corresponding upper and lower slats 11 and 13 is extended, as seen in Figs. 3 and 5, a transverse rounded bar or wire 15, the ends of which are held in the lateral rails 15^a 15^a of the casing 8 of the device, and in the devices 10 of each longitudinal series are produced alined openings 16, through which is loosely passed or threaded a flexible connection 17, which may be a cord, wire, or other part and has one end passed outside of the casing 8 at the upper end of the stem of the instrument and connected with a straining-key 18, which when turned is designed to place said cord or connection 17 under tension.

The opposite end of each cord or connection 17 is joined, as seen in Fig. 3, with the lower end of one arm of an elbow or bell-crank lever 19, pivoted on a bar or wire 20, extended transversely across the space between brackets 21 21, erected at the corresponding end of casing 8, as indicated in Figs. 1, 2, and 3, there being, as seen in said figures, an elbow or bell-crank lever 19 for each series of de-

vices 10 coupled to the connection 17, which is passed through the devices of that particular series.

Each elbow-lever 19 comprises an extended arm 22, formed of a wire bail, as herein shown, the looped end or bight 23 of which is bent upward and engaged over a pin 24, extended from the adjacent end of a lever 25, pivoted on a wire or rod 26, which is extended transversely between brackets 27, erected on the side bars 7 7 of the frame of the device. There is a lever 25 corresponding to each elbow-lever 19, and said levers 25 and 19 are alined lengthwise of the instrument, and the end of each lever 25 opposite to the lever 19 is extended beneath a yoke 28, erected on the side bars 7 7 and has beyond said yoke a hook 29, over which is engaged the upper end of a rubber band 30 or other elastic device, the lower end of which is connected with a hook carried on a brace 31, extended between the side bars, as indicated in Figs. 2 and 3.

By means of the elastic device 30 it will be seen that the hooked end of each lever 25 is normally drawn downward, so that its opposite end is elevated, as indicated at *x* in Fig. 3, and the pin 24 on said elevated end of lever 25 being engaged beneath the bight 23 on the arm 22 of the corresponding lever 19 serves to tilt or rock said lever 19 pivotally, so as to draw its downwardly-extended arm forwardly away from the end of casing 8, whereby the corresponding flexible connection 17, coupled to said lever 19 and extended through the openings 16 in the corresponding series of fingering devices 10, is placed under tension and is maintained taut, so that the several fingering devices 10 are held in raised position. At the same time it will be understood that when pressure is applied upon either one of the fingering devices to press the same toward the stem of the instrument to shorten the corresponding strings 3 such movement is permitted, owing to the elastic nature of the rubber bands 30.

Since the flexible connections 17 are extended in the casing 8 above the rounded wires or bars 15, it will be seen that when pressure is applied upon one of the fingering devices 10 to depress the same, as indicated in Fig. 3, and move the strings beneath it into engagement with the corresponding fret 5 the flexibility of said connection 17 will permit of its being bent downward between and over the rounded faces of the wires or bars 15 on opposite sides of the device 10, which is depressed, and this downward bending of the connection 17 will serve to draw the downwardly-extended arm of lever 19 toward the casing 8, from which it is normally drawn away by reason of the tension of the band 30.

When one of the fingering devices 10 is depressed, the corresponding lever 19 will be

rocked, and at the same time the elevated end of the corresponding lever 25 will be depressed toward the strings 3 to a position substantially horizontal, as indicated in Fig. 3, although the extent of depression is immaterial to my invention, and to limit the depression of said lever 25 I provide on the yoke 28 a series of set or adjusting screws 32, the tip of each of which is adapted to engage with the underlying end of one of the levers 25 when such lever is rocked or pivotally moved by operation of one of the corresponding fingering devices. By this means it will be seen that the extent of depression of said levers 25 may be conveniently regulated.

In carrying out my invention I utilize the downward movement of levers 25 coincident with actuation of the fingering devices for automatically controlling the operation of the picking devices, and for said picking devices I provide actuating means adapted for continuous operation and comprising a toothed wheel 33, held to turn on the frame-plate 9 and having a handle 34, by means of which it may be actuated, and having teeth in engagement with those of a pinion 35, also held to turn on plate 9 and having on its upper side a crank or wrist pin coupled by a link 36 with one end of a lever 37, pivoted on a lug 38 at one side of casing 8, along which said lever 37 is extended, with its opposite end connected, as shown at 39, with an arm 40, extended laterally from one side or end of the carrier 41 for the picking devices, which carrier 41 is extended, as seen in Figs. 1, 2, 3, and 4, transversely between the frame-bars 7 7 beneath the normally elevated ends of the levers 25 and is adapted when the driving means above described is actuated to have imparted to it a rapid reciprocating movement in a direction above and transversely of the plane in which the several strings 3 of the instrument extend.

The carrier 41 is forked and has, as herein shown, a lining 44 extended along the inner surface of each of its bifurcations, and in said linings, at opposite sides of the carrier, are produced corresponding vertically-extended guide-groove 44^a, there being a pair of aligned grooves 44^a, corresponding with each of the levers 25, for coöperation with the picking device thereof, as will be explained.

42 42 indicate the picking devices, each of which has an upper perforated extension, which may, if desired, be produced from some yielding material, as indicated at 43, and which is engaged on the pin 24 at the depressible end of the corresponding lever 25. Each picking device 42 has its lower end extended between the forks of the carrier 41 and is provided at opposite sides of its lower extremity with outwardly-extended elastic pivots or projections 45, engaged with the corresponding grooves 44^a in opposite linings of the carrier in such a way as to permit pivotal move-

ment of the picking device upon the pin 24 as a center of oscillation when the carrier is reciprocated by actuation of its driving devices, as above described. Each picking device is also provided at its lower extremity with a downwardly-extended pick 46, adapted for engagement with the corresponding strings 3 of the instrument in a way similar to that of the ordinary mandolin-pick for sounding said strings on manipulation of the fingering devices and driving means above described.

In the operation of the device when one of the fingering devices 10 is depressed the connection 17 thereof will be drawn upon so as to swing the levers 19 and 25 pivotally against the tension of the elastic devices 30, and owing to the connection of the picking devices 42 with the pins 24 it will be understood that the picking devices 42 corresponding to and connected with the lever 25, which has been rocked by depression of said fingering device 10, will be pressed downward, its pivot projections 45 traversing the grooves 44^a in the carrier-lining until the pick 46 has been sufficiently lowered to engage and sound the corresponding strings 3 of the instrument. In this way it will be seen that, owing to the rapid reciprocation of the carrier 41 across the plane of the strings 3 of the instrument, the correct tremolo sound will be afforded, so that each note will be correctly sounded upon depression of the corresponding fingering device 10, the picking devices not in use remaining elevated, with their picks 46 out of position for engagement with the strings, but with their pivotal projections 45 still seated within the grooves 44^a of the lining 44 of the carrier in position for ready downward movement when their corresponding strings are to be sounded.

From the above description it will be seen that the improved instrument is of an extremely simple and inexpensive nature and is especially well adapted for use, since it permits of being played by persons not sufficiently familiar with the instrument for playing in the ordinary way and also permits of being readily adjusted so that the proper engagement of the picks 46 with the strings may be insured, this being conveniently effected by movement of the screws 32, which limit the rocking of levers 25, and consequently limit the downward movements of the picking devices 42. Further, the device is of an extremely simple and inexpensive nature and is capable of being readily taken apart when desired for repair or other purpose and is of a strong and compact construction, and it will also be obvious from the above description of my invention that the device is susceptible of considerable modification without material departure from the principles and spirit of the invention, and for this reason I do not wish to be understood as limiting

myself to the precise form and arrangement of the several parts of the device as herein shown in carrying out my invention in practice. For example, I do not wish to be
 5 understood as limiting myself to the employment of the manually-operated driving means for the picking-device carrier, since it will be evident that driving means of other kinds may be effectively substituted therefor in many
 10 cases, and such driving means may be spring or other motors.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

15 1. A musical instrument having a string, a series of fingering devices extended along the string for engagement therewith at different points, a sounding device movable in and out of position to engage the string and
 20 having actuating means and a mechanical device extended along the series of fingering devices and having connection with each of said devices and also having connection with the sounding device for moving the same in
 25 position to engage the string.

2. A musical instrument having a string, a series of fingering devices extended along the string for engagement therewith at different points, a sounding device movable in
 30 and out of position to engage the string and having actuating means and a mechanical connection between said sounding device and the fingering devices and comprising a flexible connection extended along and having en-
 35 gagement with each of the series of fingering devices, said connection being adapted, when one of the fingering devices is moved, to move the sounding device in position for engagement with the string.

40 3. A stringed musical instrument having fingering devices, sounding devices having actuating means and movable in and out of position to engage the strings, elastic means to hold the sounding devices out of position
 45 to engage the strings and mechanical means

actuated from the fingering devices and controlling the movement of the sounding devices toward and away from the strings.

4. A musical instrument having a string, fingering devices, a pivotally-mounted lever, 50 a sounding device having actuating means and connected with the lever for movement toward and from the string when the lever is pivotally moved and mechanical means for pivotally moving the lever from the fingering 55 devices when actuated.

5. A musical instrument having a string, fingering devices, a pivotally-mounted lever having a pin at one end, a sounding device having actuating means and having a per- 60 forated end held on said pin, said sounding device being adapted to move in unison with said lever toward and from the string, an elbow-lever pivotally mounted and having one arm engaged with the pin of the first- 65 named lever to move the same toward the string, means to move said first-named lever away from the string and a flexible connection coupled to the other arm of the elbow-lever and having engagement with said finger- 70 ing devices.

6. A musical instrument having strings, a frame extended above the instrument and having a casing provided with transversely-extended slats having aligned kerfs, wires ex- 75 tended in the kerfs and across the spaces between the slats, fingering devices movable toward and from the strings in the spaces intervening between the slats and wires, sounding devices having actuating means and flexible 80 connections extended along the fingering devices and engaged therewith and connected with the sounding devices and adapted when the fingering devices are actuated, to move the sounding devices toward the strings.

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