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PATENTED MAR. 29, 1904.

L. HARRISS & W. H. KENDALL.

TOUCH REGULATING ATTACHMENT FOR PIANOS.

APPLICATION FILED MAR. 12, 1903.

NO MODEL.

3 SHEETS—SHEET 1.

Fig. 1.

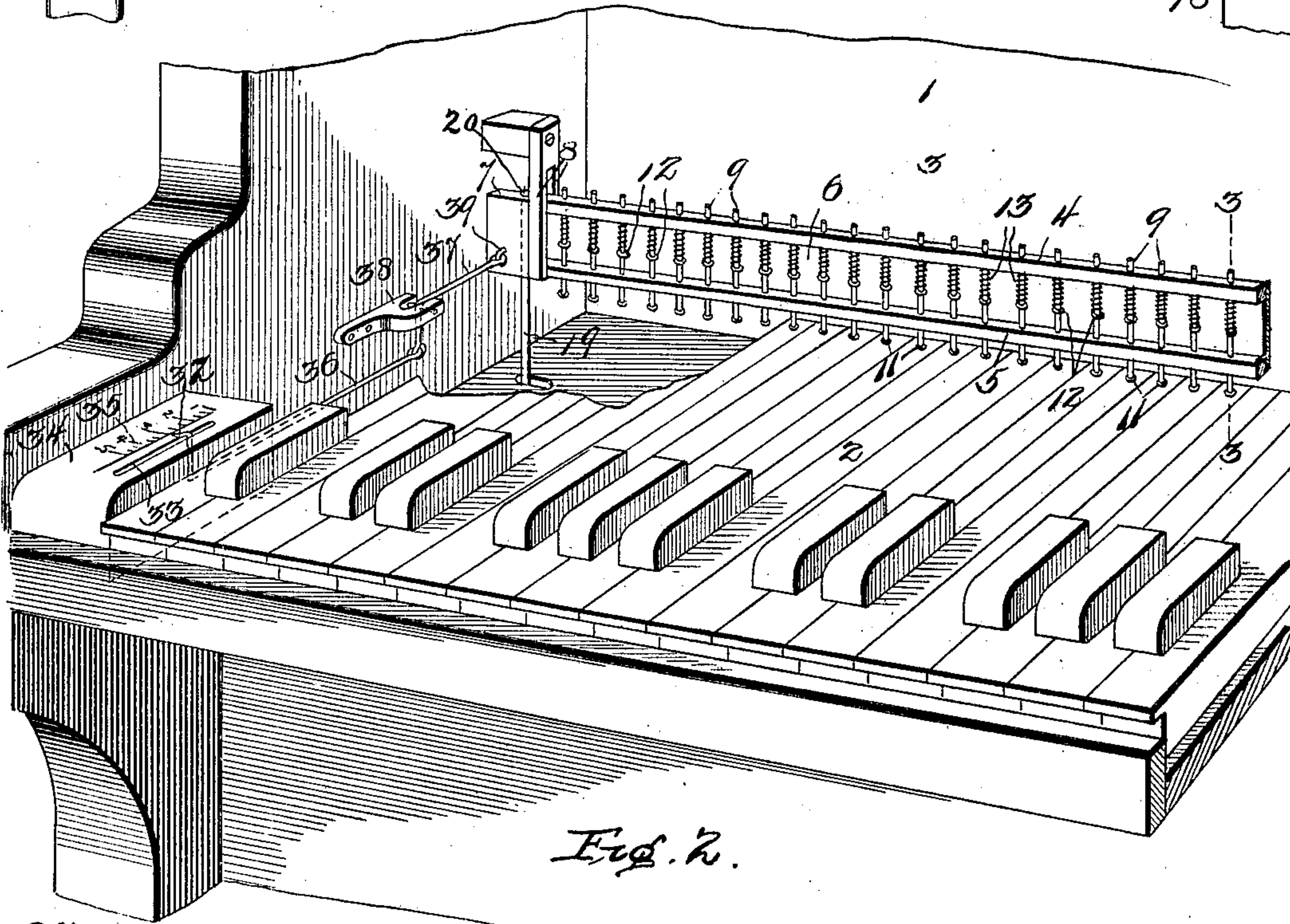
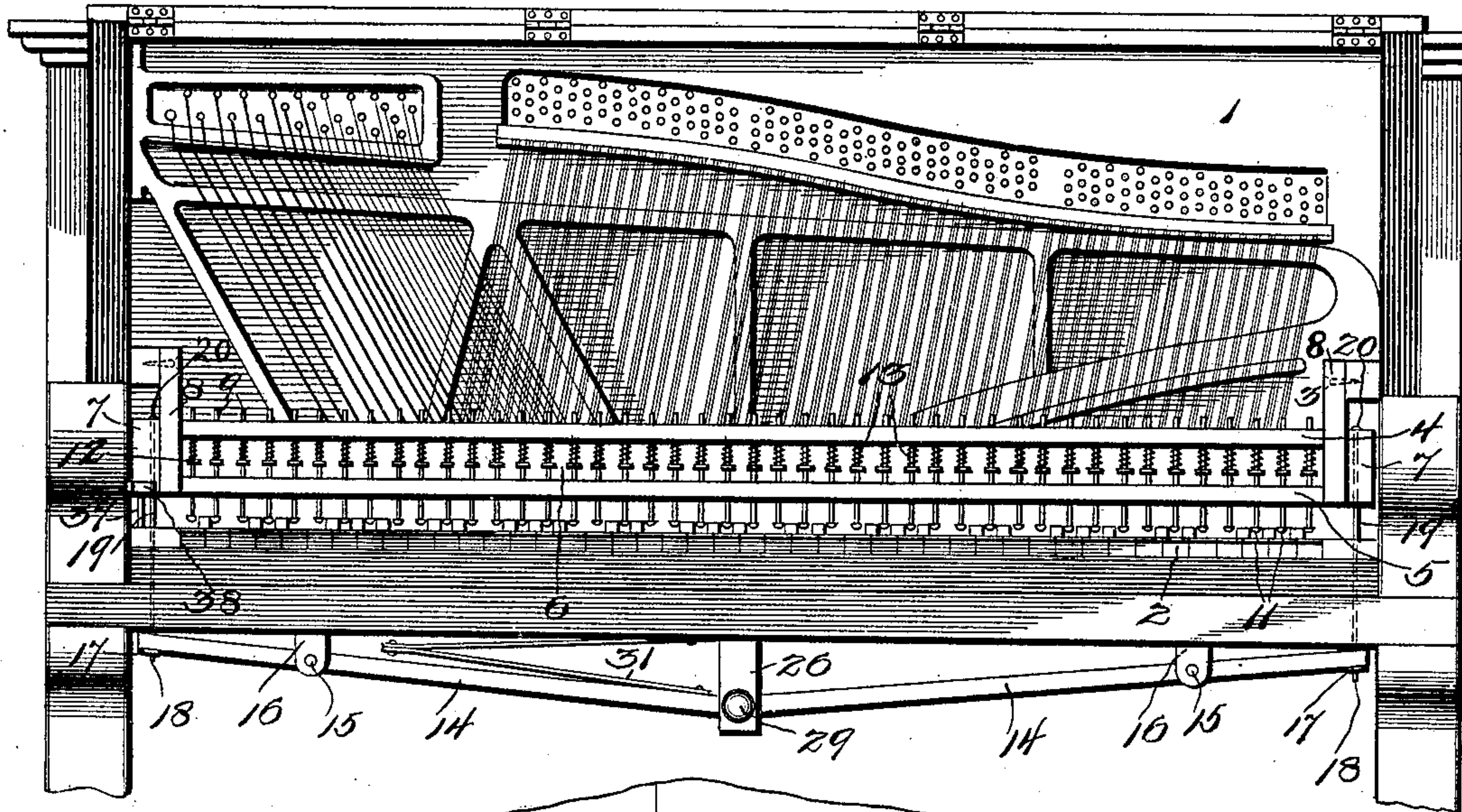


Fig. 2.

Witnesses

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3 SHEETS—SHEET 2.

Fig. 4.

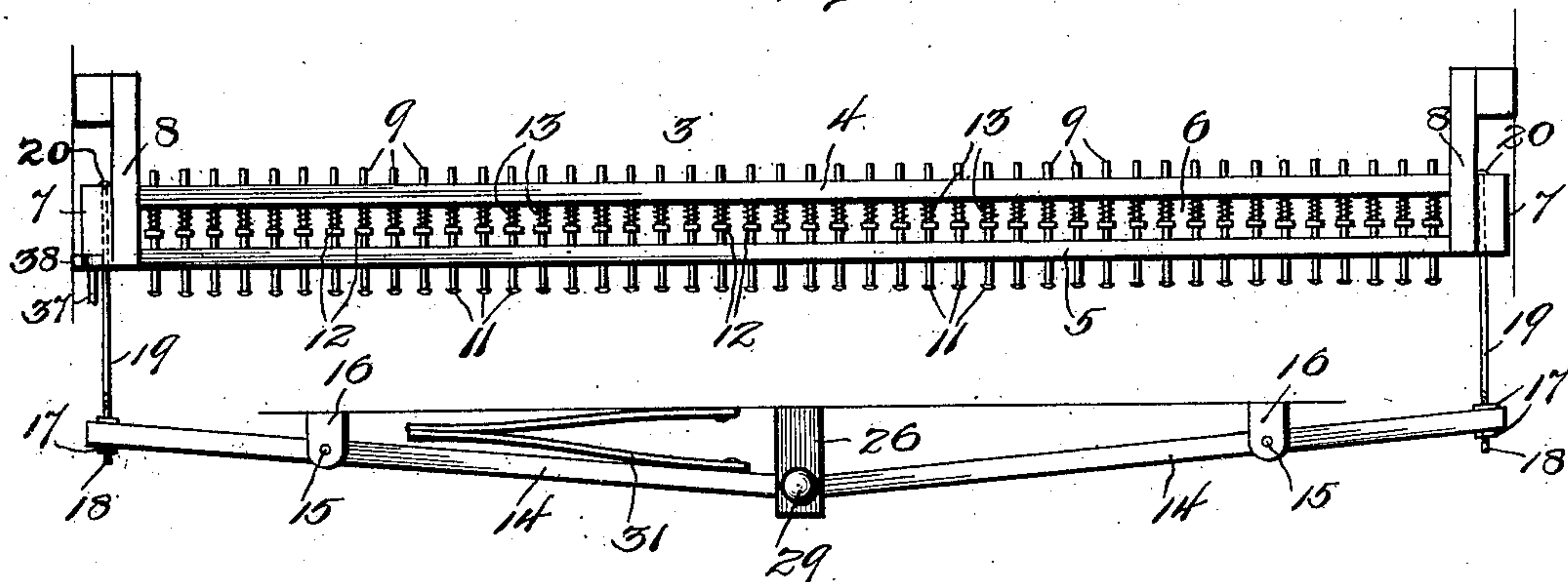


Fig. 5.

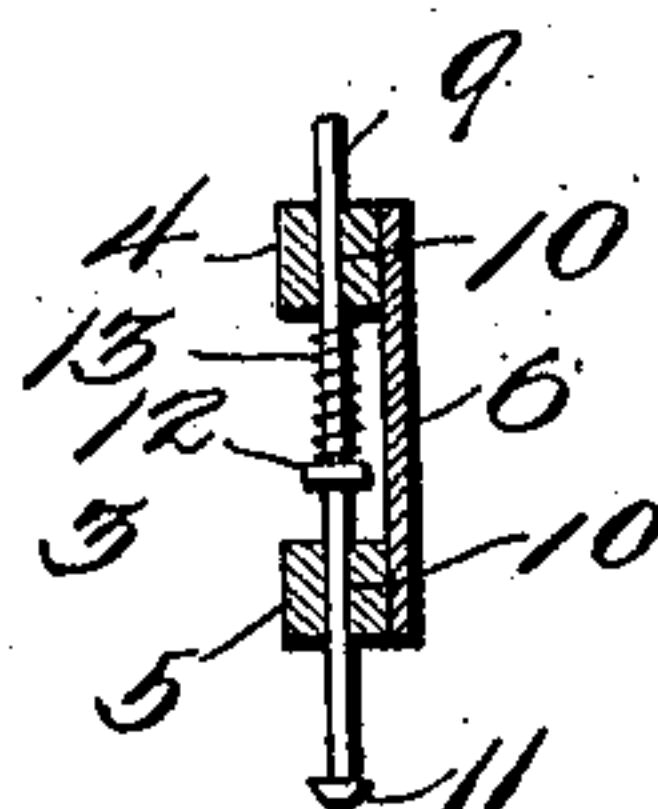
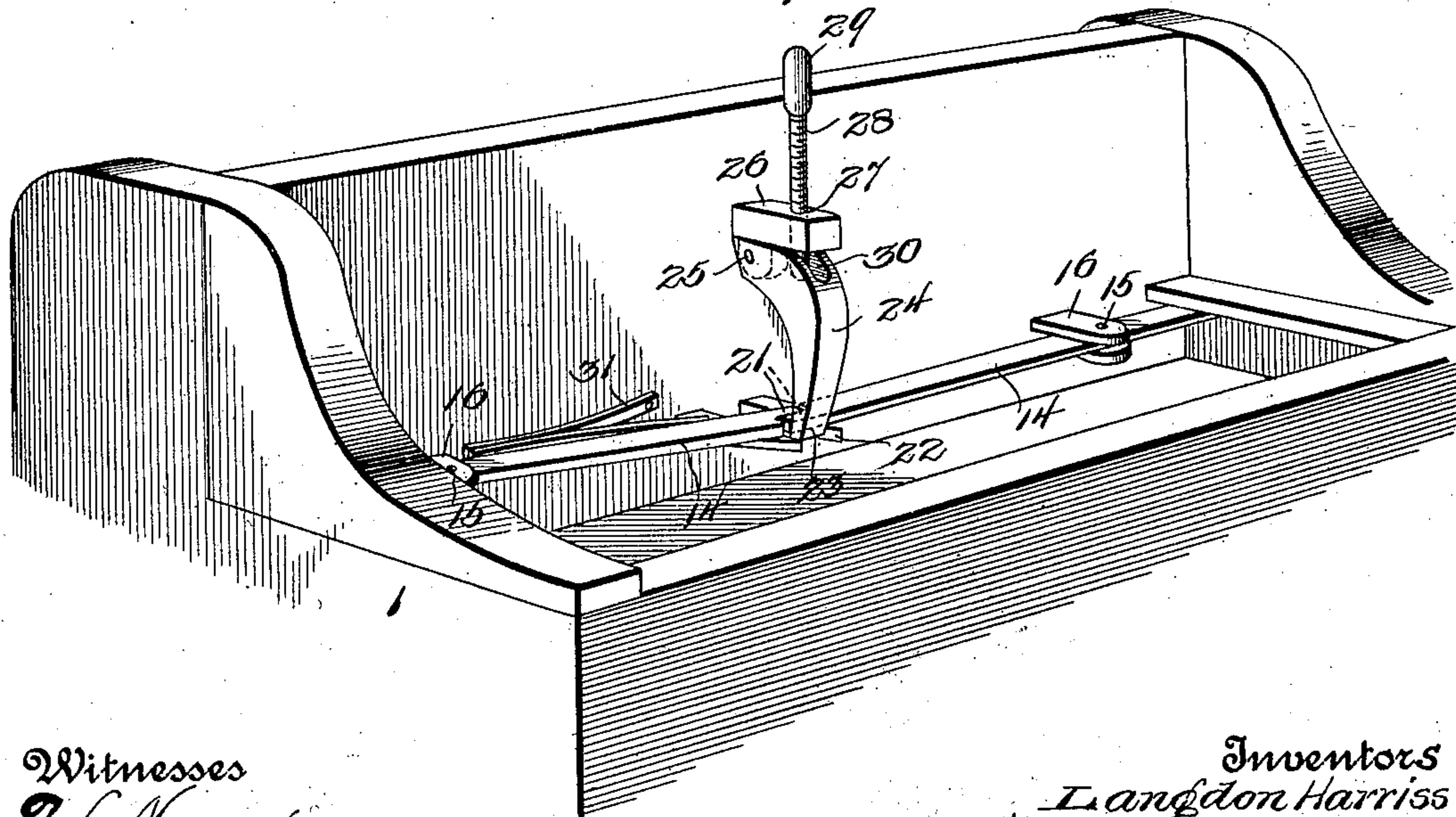


Fig. 6.



Witnesses

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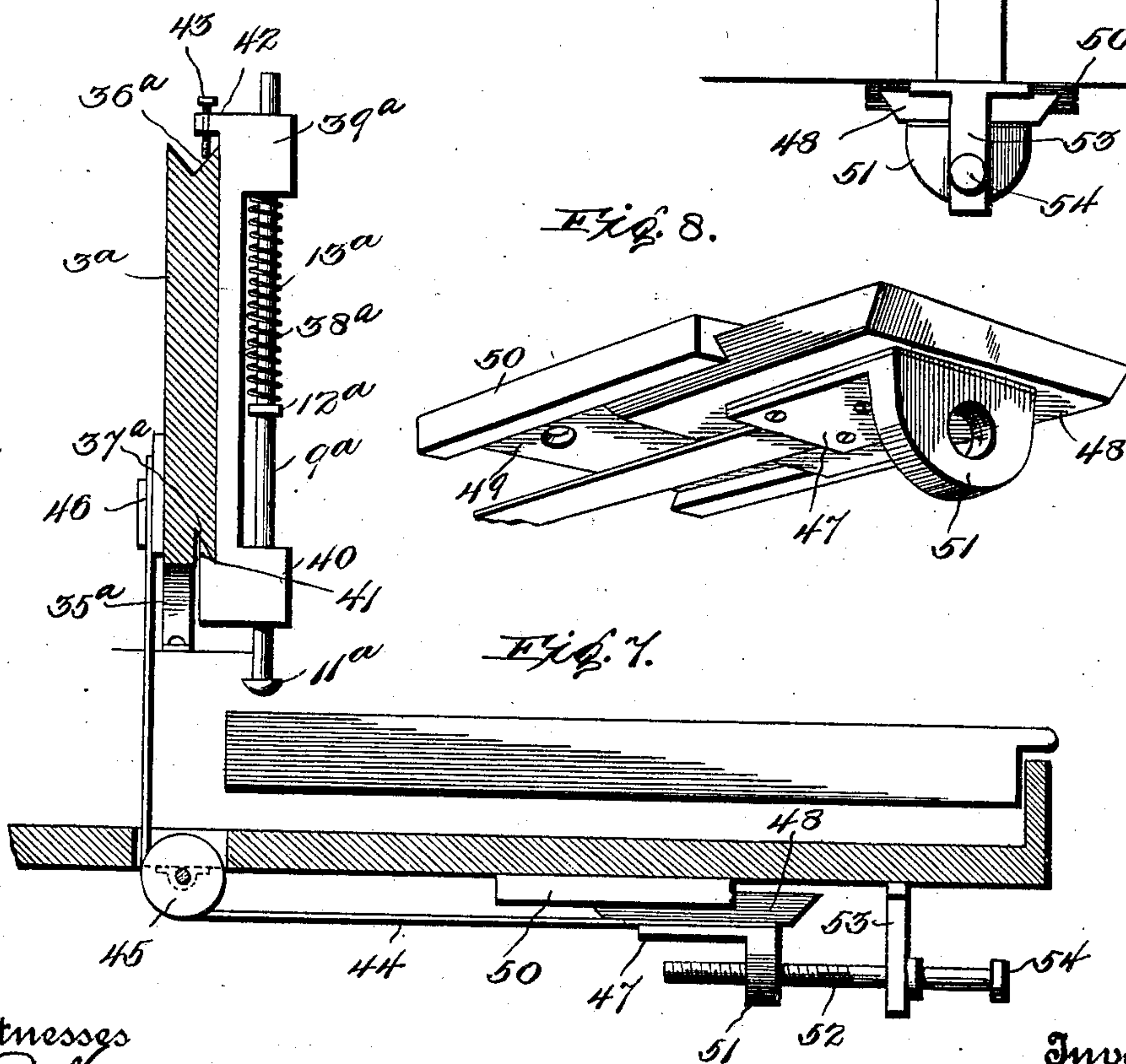
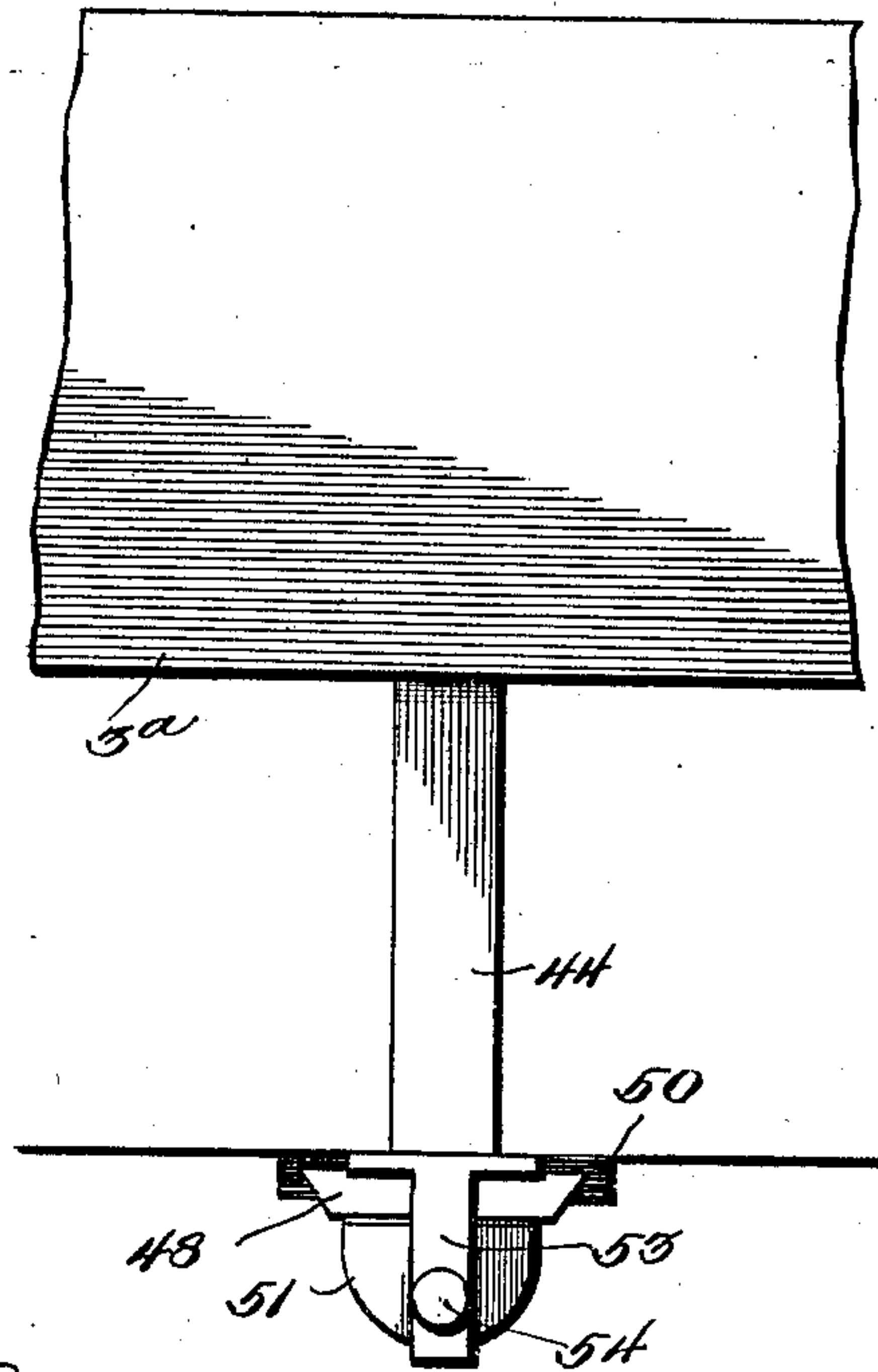
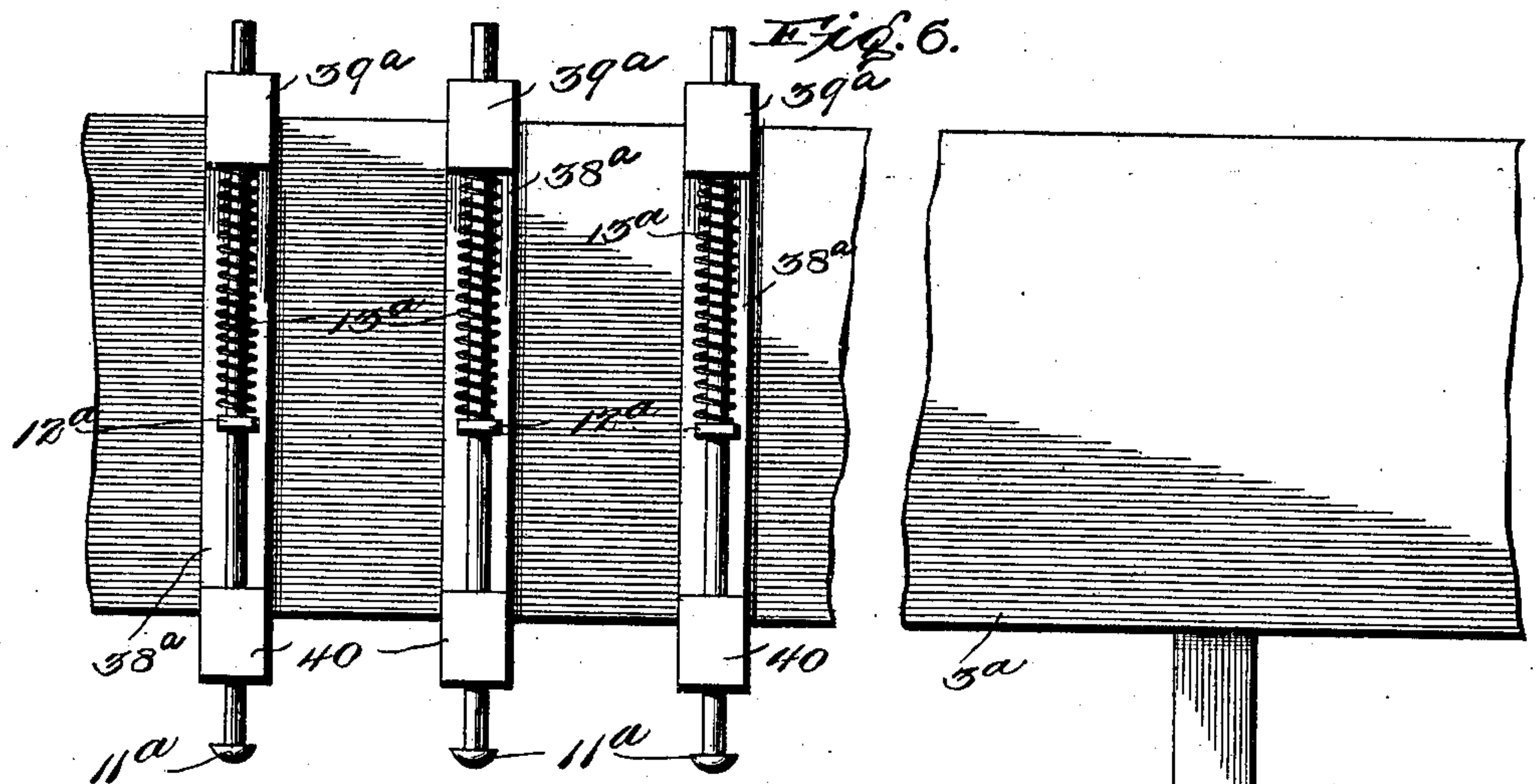
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3 SHEETS—SHEET 3.



Witnesses

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UNITED STATES PATENT OFFICE.

LANGDON HARRISS AND WILLIAM H. KENDALL, OF WACO, TEXAS.

TOUCH-REGULATING ATTACHMENT FOR PIANOS.

SPECIFICATION forming part of Letters Patent No. 756,016, dated March 29, 1904.

Application filed March 12, 1903. Serial No. 147,522. (No model.)

To all whom it may concern:

Be it known that we, LANGDON HARRISS and WILLIAM H. KENDALL, citizens of the United States, residing at Waco, in the county of McLennan and State of Texas, have invented certain new and useful Improvements in Touch-Regulating Attachments for Pianos, of which the following is a specification.

This invention relates to piano attachments of the type designed for regulating the touch of the instrument, whereby any desired degree of tension or stiffness of the keys may be afforded.

To this end the invention contemplates a simple and practical type of touch-regulating mechanism applicable to any of the ordinary makes of upright pianos and providing effectual means for regulating the stiffness or resistance of the keys at the desire of the performer.

The invention also provides a construction wherein the regulation of the key-action is uniform throughout the entire keyboard, while at the same time the mechanism is so constructed as to prevent sluggishness or sticking of the keys, besides securing the greatest elasticity and responsiveness of touch.

Also the invention has in view a construction wherein the student is enabled to secure a maximum finger and wrist strength, suppleness, and endurance, affording the complete range of manual calisthenics, by means of which the student is enabled to obtain the desired technique.

Furthermore, the invention provides a construction which contributes materially to the elasticity and responsiveness of the piano-action without lost motion, looseness, or rattling of the keys, and also has in view a novel arrangement of parts wherein any desired degree of tension or stiffness may be obtained and such tension or stiffness accurately indicated to the performer through the medium of a conveniently-located indicator device.

With these and many other objects in view, which will more readily appear as the nature of the invention is better understood, the same consists in the novel construction, combination, and arrangement of parts, as will be hereinafter more fully described, illustrated, and claimed.

The essential feature of the invention involved in the novel construction and arrangement of the regulating mechanism proper, the operating device therefor, and the tension-indicator is necessarily susceptible to considerable modification without departing from the spirit or scope of the invention; but a preferred embodiment of the improvements is shown in the accompanying drawings, in which—

Figure 1 is a front elevation of an upright piano with the cover and piano-action removed and exposing the operative arrangement of the touch-regulating attachment. Fig. 2 is a fragmentary perspective view illustrating a portion of the piano-keyboard and showing more plainly the construction and arrangement of the regulating-rail carrying the series or gang of independently-yieldable pressure-pins. Fig. 3 is a detail cross-sectional view on the line 3 3 of Fig. 2, showing the preferred mounting of one of the independently-yieldable pressure-pins. Fig. 4 is an elevation of the complete attachment *per se* disassociated from the piano. Fig. 5 is a perspective view of the under side of the piano-keyboard, exposing the construction of operating device for throwing the regulating elements in and out of action and also for varying the pressure thereof upon the keys. Fig. 6 is a fragmentary elevation of a modified form of the touch-regulating attachment or mechanism, illustrating a sectional construction wherein the support or mountings for the individual regulating elements or pins are separate and distinct and are individually removable and replaceable with reference to the regulating-rail proper. Fig. 7 is a vertical sectional view transverse of the regulating-rail and including the adjacent portions of the piano-case to better illustrate the construction and arrangement of the parts shown in Fig. 6. Fig. 8 is a detail in perspective of a portion of the operating device associated with the modified construction shown in Figs. 6 and 7.

Like reference-numerals designate corresponding parts throughout the several figures of the drawings.

The adaptation of the invention to a piano requires no alteration of the latter and does not interfere with the usual manipulation of

the instrument, while at the same time adding to the latter the function of embodying means whereby the degree of stiffness or resistance of the keys may be regulated at the desire of the performer.

For illustrative purposes there is shown in the drawings a sufficient portion of an upright piano to indicate the operative position of the coöperating elements of the touch-regulating mechanism, and referring particularly to these drawings the numeral 1 designates the case or body portion of the instrument housing the usual piano-action and supporting the keys 2, coöperating with the piano-action in the usual manner.

What might be properly termed the "main" part of the touch-regulating mechanism comprises a pressure member 3, preferably in the form of a vertically-movable regulating-rail arranged in an upright position over the rear portions of the keys 2 inside of the case of the piano and extending longitudinally the full length of the keyboard, as may be plainly seen from Fig. 1 of the drawings. This vertically-movable regulating-rail may be constructed in various ways without departing from the invention; but a practical construction is shown in the drawings as consisting of a pair of upper and lower rail-bars 4 and 5, made of thoroughly-seasoned wood and arranged in spaced parallel relation. These upper and lower rail-bars 4 and 5 constitute the main body portion of the rail and are rigidly braced together in any approved manner. Usually the rail-bars are rigidly united and braced together through the medium of a body-plate 6, extending the full length of the rail and firmly secured to one side of the bars, as plainly shown in Figs. 2 and 3 of the drawings. By reason of the body-plate 6 at one side of the bars 4 and 5 extending the entire length of the latter the same degree of strength is provided throughout the regulating-rail, and the rail structure is further strengthened by end blocks 7, located at the opposite ends of the rail and firmly united to the terminals of the bars 4 and 5, so as to constitute an intimate part of the rail construction.

The vertically-movable regulating-rail is held to a working position within the piano-case, so as to not interfere in the least with the piano-action therein. While various expedients may be employed for maintaining the rail to movement in a fixed plane, a simple construction for effecting this result is illustrated as consisting in the employment of stationary guide-brackets 8, arranged in an upright position within the case and secured to portions thereof adjacent to the opposite ends of the rail. The said rail 3 in itself constitutes a carrier for a series or gang of individual regulating elements 9. These regulating elements are preferably in the form of vertically-arranged independently-yieldable pressure-

pins working in vertically-alined guide-openings 10, provided in the upper and lower rail-bars 4 and 5 and provided at their lower ends with cushion-contact feet 11, designed to engage with and bear on the upper side of the rear end portion of the keys with which they are associated. Each of the said independently-yieldable and vertically-arranged pins 9 has fitted thereon at an intermediate point a felt or equivalent abutment-collar 12, between which and the upper rail-bar 4 is interposed a tension-spring 13, which is compressed to any desired degree by the downward adjustment of the regulating-rail 3 in the manner to be presently explained.

The independently-yieldable vertically-arranged pressure-pins 9, carried by the regulating-rail 3, usually consist of wooden rods, though any suitable material may be utilized in the making thereof. However, in all cases the said pins 9 correspond in number and position to the keys of the piano, so that there is one pressure-pin 9 associated with each key, so that when the regulating-rail is lowered each of the keys will have imposed thereon the pressure of one of the pins.

The adjustment vertically of the movable regulating-rail to and from the keys is accomplished through the medium of an operating device conveniently accessible to the performer. This operating device includes a pair of synchronously-movable adjusting-levers 14, arranged at the under side of the keyboard. These adjusting-levers are preferably disposed within the vertical plane of the pressure member or regulating-rail 3, and each of the same is pivotally mounted intermediate its ends, as at 15, in a hanger-bracket 16, fitted to the under side of the keyboard, and at its outer extremity each of said levers has adjustably connected therewith through the medium of the clamping-nuts 17 the lower threaded end 18 of a pull-rod 19, the upper end of which is suitably connected, as at 20, to one end of the pressure member or regulating-rail 3.

The pivotally-hung adjusting-levers 14 extend inwardly from their terminal connections with the pull-rod 19 to a central point beneath the keyboard, and at such point the said adjusting-levers are provided with loosely-interlocked rabbeted ends 21, working upon a guiding-bracket 22, fitted to the bottom of the keyboard and beneath which rabbeted ends bears the inner engaging nose 23 of a vertically-swinging actuating-lever 24. This vertically-swinging actuating-lever 24 is pivotally hung at its outer extremity, as at 25, upon a supporting-bracket 26, also mounted upon the under side of the keyboard, and which bracket is provided with a threaded nut-opening 27, receiving the threaded shank 28 of the setting member 29, which setting member is preferably in the form of a screw. The inner end of the threaded shank 28 preferably en-

gages a bearing socket or groove 30, provided in the pivoted end portion of the lever 24, whereby said lever will readily accommodate itself to the endwise movement of the screw or setting member 29 as it is manipulated through the nut or nut-opening 27. Associated with these elements constituting the operating device is a readjusting-spring 31, which may be conveniently interposed between the upper side of one of the levers 14 and the under side of the keyboard, so that when the setting member is moved outward to relieve the actuating-lever 24 the said spring 31 is permitted to exert its tension in a downward direction upon both of the adjusting-levers by reason of their interlocked connection, with the consequence of moving the pull-rods 19 upwardly, and thus elevating the pressure member or regulating-rail to the desired position.

Another feature of the invention resides in associating with the touch-regulating mechanism proper a tension-indicator whereby the performer may determine accurately the degree of strength, pressure, or resistance imposed upon the keys by the individual regulating elements carried by the member or rail 3. This tension-indicator includes in its organization a pointer 32, which may be conveniently exposed through a slot 33, provided in the cheek-block 34, arranged at one end of the keyboard, and upon which cheek-block is arranged a suitable indicating-scale 35, having suitable graduations along which the pointer plays to give the proper indications. The said pointer 32 is preferably carried at one end of a carrier-rod 36, the other end of which is connected to one arm of an adjusting bell-crank 37, pivotally mounted at its angle in the supporting-bracket 38, fitted to the piano-case, and whose other arm is suitably connected at 39 to the adjacent end of the pressure member or regulating-rail 3. By reason of these connections the indicator is directly responsive to the movement of the pressure member or regulating-rail, with the consequence of giving accurate indication upon the scale 35 of the tension or pressure with which the regulating elements or pressure-pins 9 are held upon the keys.

By reason of employing a setting member 29 of a screw-rod type it will be obvious that the same acts in the capacity of a lock for holding the regulating-rail firmly set in any position to which it may be adjusted, and in this connection it will be observed that through the medium of the screw-rod or setting member 29 a wide range of adjustment is provided for the regulating-rail, so that any tension of the springs 13 may be provided for, with the consequence of holding the pins 9 upon the keys at any pressure desired by the performer, hence admitting of the mechanism being adapted to the needs of any student.

The essential features of the construction

already described may be preserved in modifications such as suggested in Figs. 6, 7, and 8 of the drawings. In these figures of the drawings is illustrated a very practical and advantageous construction, which greatly simplifies the trapwork, while at the same time presenting a sectional type of attachment wherein the carrying or supporting means for the individual regulating elements or pins are separate and distinct from each other, and hence are individually removable and replaceable with reference to the rail proper. This supplies the distinct advantage of making all parts of the touch-regulating attachment individually accessible for purposes of repair or adjustment, which is of special importance in connection with the individual regulating elements or pins on account of the necessity at times of replacing or adjusting the spring therefor.

Referring more particularly to the modified construction, the reference-numeral 3^a designates the vertically-movable regulating-rail proper, which essentially consists of a single bar or strip of wood in contradistinction to the upper and lower rail-bar construction previously described, but occupying the same position over the rear portions of the piano-keys within the case or housing. The said vertically-movable regulating-rail is held to its proper working position within the case by such expedients as suggested in connection with the rail 3 of the other construction and is intended to be normally and yieldingly sustained in its elevated inactive position through the medium of rail-supporting springs 35^a, preferably located beneath the ends of the rail 3^a and secured to an adjacent fixed point of support on the piano case or housing, the operative position and arrangement of such springs being shown in Fig. 7 of the drawings.

The vertically-movable spring-supported regulating-rail 3^a is provided at its upper and lower longitudinal edges with the upper and lower undercut holding-grooves 36^a and 37^a, respectively, with which cooperate the separate mountings for the individual regulating elements or pins, whereby said mountings are individually removable and replaceable for the purposes indicated.

In the construction being described each of the regulating elements or pins 9^a is carried by its own support or carrying means, which in the construction shown consists of a detachable pin-carrying bracket 38^a, adapted to be arranged upright at one side of the rail 3^a, and provided at its upper and lower ends with the guiding-ears 39^a and 40, respectively, the openings of which ears slidably receive the regulating element 9^a, which, like the other construction, consists of a yieldable pin provided at its lower end with a cushion-contact foot 11^a, designed to engage with a bar on the upper side of the piano-key with which

it is associated. The said yieldable pressure-pin 9^a also has fitted thereon at an intermediate point a suitable abutment-collar 12^a, between which and the upper guiding-ear 39^a is interposed a tension-spring 13^a.

The separate mounting or pin-carrying bracket 38^a for each pressure-pin 9^a is provided at the lower end portion thereof with an engaging hook 41, adapted to interlock with the lower undercut holding-groove 37^a of the rail, and at the diametrically opposite upper end portion the said bracket 38^a is provided with a lug 42, in which is mounted a vertically-arranged retaining-screw 43, adapted to engage with the upper undercut holding-groove 36^a, thereby providing a detachable yet secure fastening for the individual pin-carrying bracket.

In the modification illustrated there is also shown a modified form of operating device for drawing the regulating-rail, with its gang of pressure-pins, in a downward direction for effecting a regulation in the touch. This modified form of operating device includes a pull-tape 44, passing around a guiding-pulley 45, supported at the bottom of the keyboard and securely fastened at one end, as at 46, to a central portion of the rail 3^a, at one side thereof. The opposite end portion of the tape 44 extends beneath the piano-keyboard and is securely fastened, as at 47, to the under side of a reciprocatory dovetailed adjusting-slide 48, working in a correspondingly-dovetailed slideway 49 of a fixed guiding or guide block 50, fastened to the under side of the keyboard. The adjusting-slide 48 has fitted thereto a threaded nut member 51, engaged by the threaded shank of a setting member or screw 52, having a swivel-mounting in a swivel-bracket 53, secured to the under side of the keyboard and provided at its front end with a handle or button element 54, which is grasped by the operator to turn the screw in either direction. Through the medium of the setting member 52 the slide 48 may be moved forward or backward according to the tension desired to be placed upon the keys and also for permitting the springs 35 to support the rail with its attachments elevated in an inoperative position.

From the foregoing it is thought that the construction, operation, and many advantages of the herein-described touch-regulating attachment for pianos will be readily apparent without further description, and it will also be understood that various changes in the form, proportion, and minor details of construction may be resorted to without departing from the spirit or scope of the invention or sacrificing any of the advantages thereof.

Having thus described the invention, what is claimed, and desired to be secured by Letters Patent, is—

1. A piano attachment of the class described comprising a vertically-movable horizontal

regulating-rail having guides rigid therewith, a plurality of independently-yieldable sliding pressure-pins working in the guides and corresponding in number and position to the keys of the instrument, a spring associated with each pressure-pin and arranged to be compressed by the downward adjustment of the rail, and an operating device having means for raising and lowering the rail.

2. A piano attachment of the class described comprising a vertically-movable regulating-rail extending the full length of the keyboard above the latter and consisting of a framework having rigidly-connected upper and lower rail-bars provided with a series of vertically-alined guide-openings therein, a plurality of independently-yieldable sliding pressure-pins working in said guide-openings of the rail-bars and corresponding in number and position to the keys of the instrument, a spring associated with each pressure-pin and arranged to be compressed by the downward adjustment of the rail, and an operating device having means for raising and lowering the regulating-rail.

3. A piano attachment of the class described comprising a pressure member arranged over the keyboard and bearing a plurality of independently-yieldable regulating elements arranged to contact with the keys, and an operating device including a pair of pivotally-supported synchronously-movable adjusting-levers having loosely-interlocked inner ends and provided at their outer ends with pull-rod connections with the end of the pressure member, a vertically-swinging actuating-lever pivotally hung beneath the keyboard and having an engaging end or element operating beneath and against the loosely-interlocked ends of the adjusting-levers, a stationary nut, a screw-setting member working through said nut and cooperating with said actuating-lever, and a readjusting-spring arranged to exert its tension against one of the adjusting-levers.

4. In a piano attachment of the class described, the combination with a vertically-movable and spring-elevated rail bearing members coacting with the keys, of the case having a slotted cheek-block member provided with an indicating-scale, a carrier-rod bearing a pointer movable in the slot of the cheek-block member and playing over the scale, and a pivotally-supported bell-crank lever having its separate arms connected respectively with the rod and said rail, the elevating-spring for the rail serving to retract the pointer to its non-indicating position, substantially as described.

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

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W. H. KENDALL.

Witnesses:

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MARIAN B. KING.