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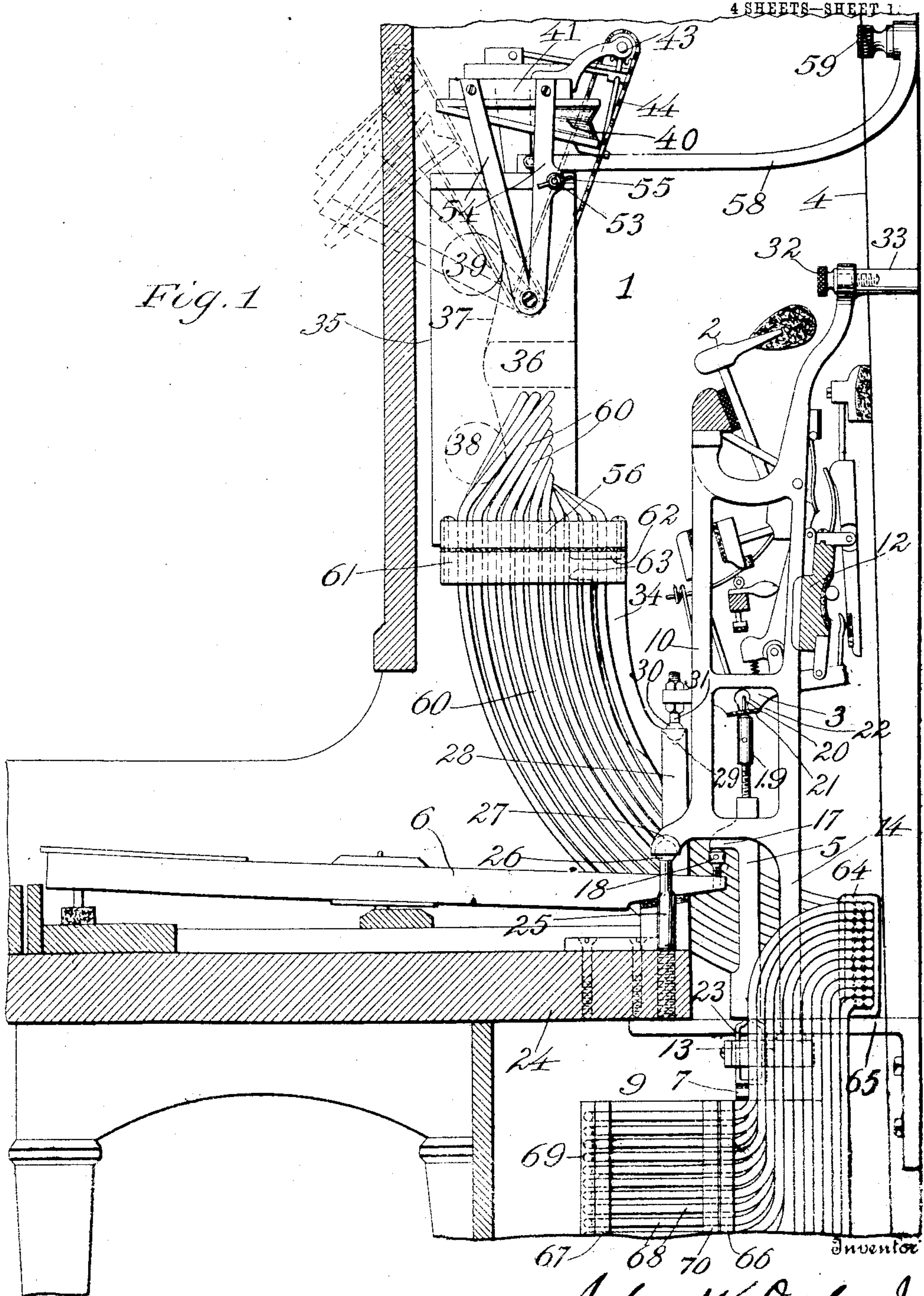
PATENTED NOV. 26, 1907.

J. W. DARLEY, JR.

COMBINED MANUALLY AND MECHANICALLY OPERATED PIANO.

APPLICATION FILED JUNE 6, 1906.

4 SHEETS—SHEET 1



Witnesses

111 Burr Lane  
 E. R. Whitman

John W. Darby Jr  
By William C. Dowell Son  
his Attorneys,



No. 871,919.

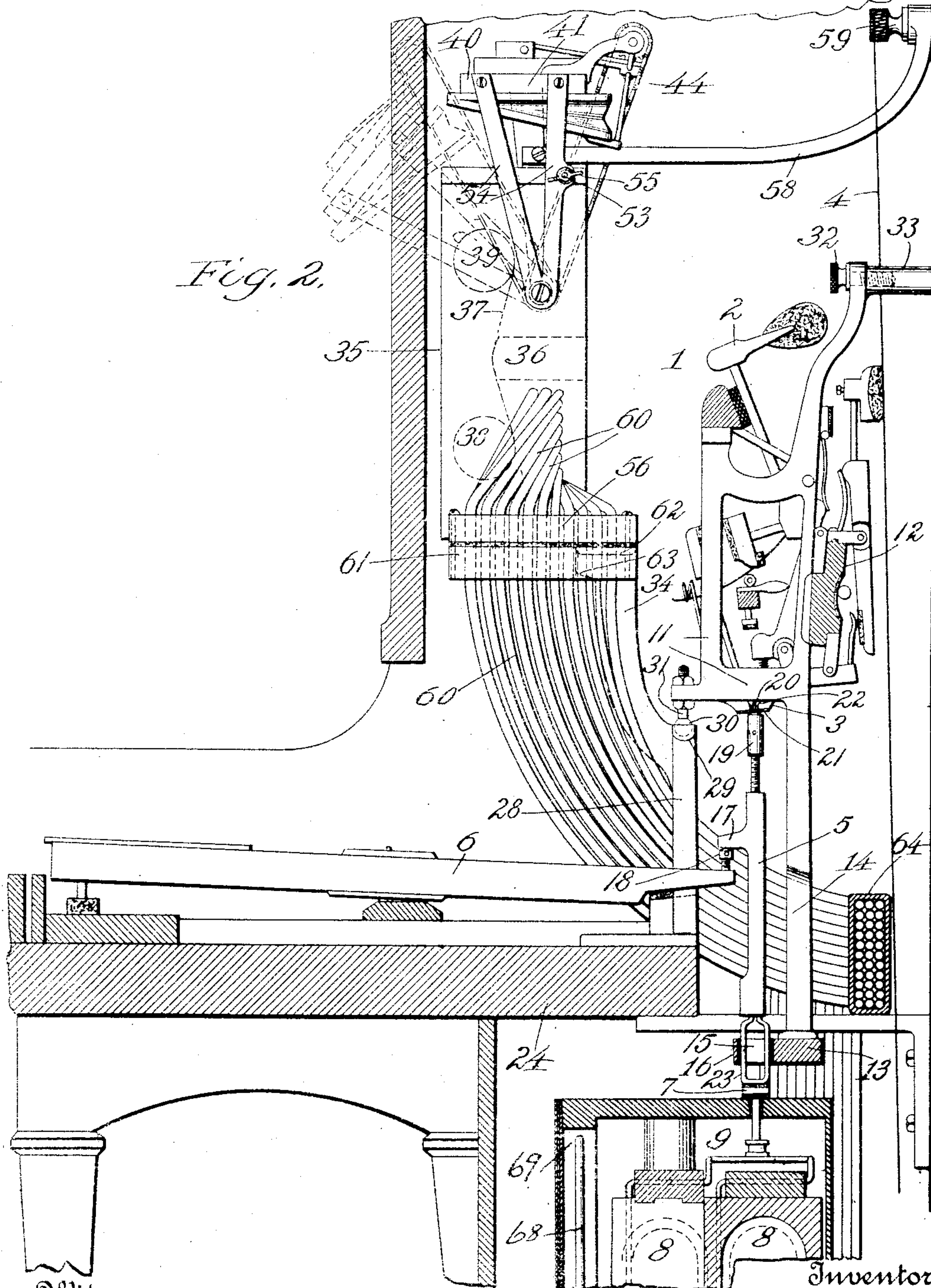
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4 SHEETS—SHEET 2



Witnesses

Alexandrine

E. R. Wetmore

Inventor

John W. Darley Jr.

By Julian C. Dowell & Son  
his Attorneys.

his Attorneys,

No. 871,919.

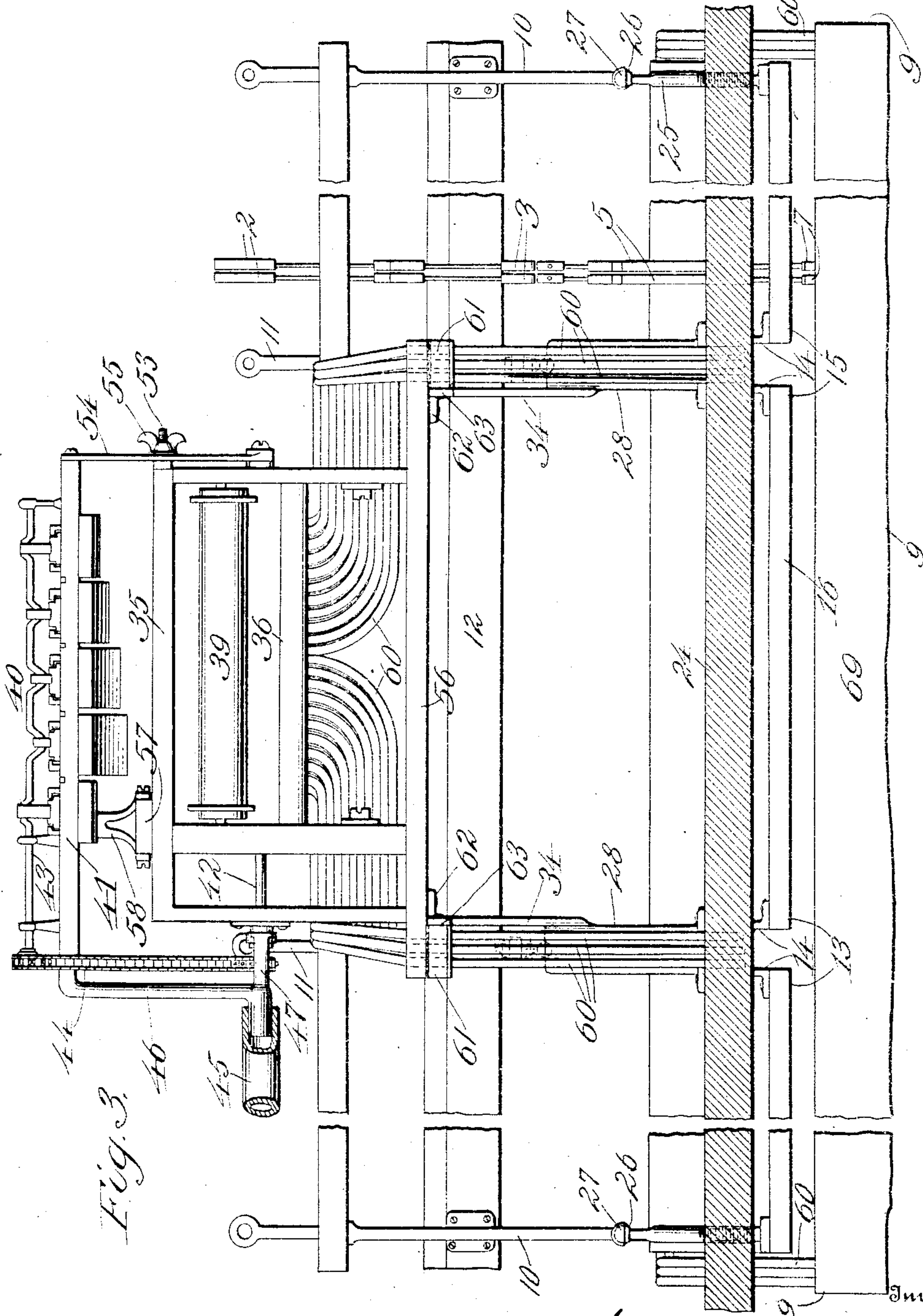
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4 SHEETS—SHEET 3.



Witnesses

Alle Bureaux

E. P. Wetnam

Inventor

John W. Darley Jr.

By *Julius C. Powell* Atty.  
*Wm. S. Attorney &*

Attorneys



No. 871,919.

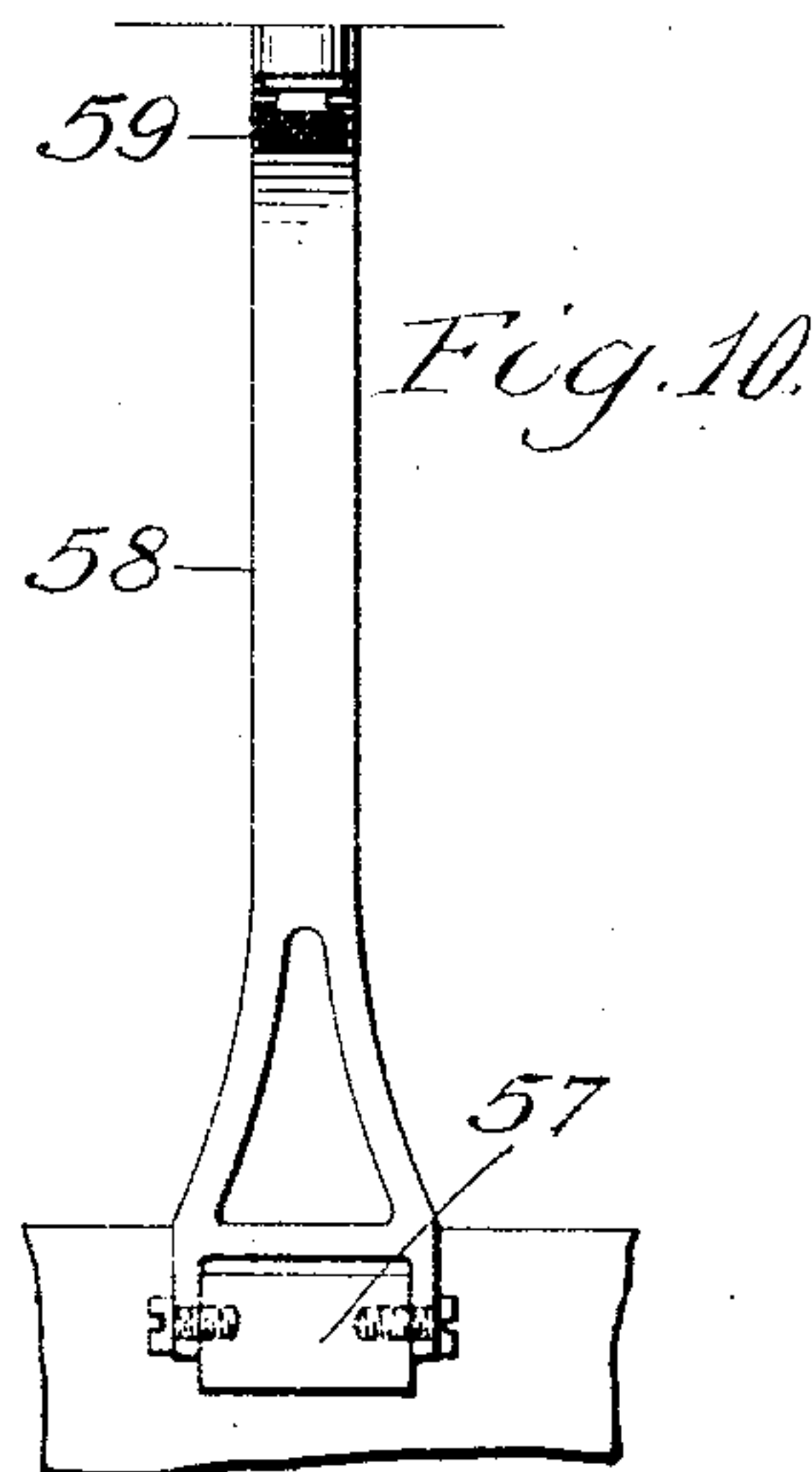
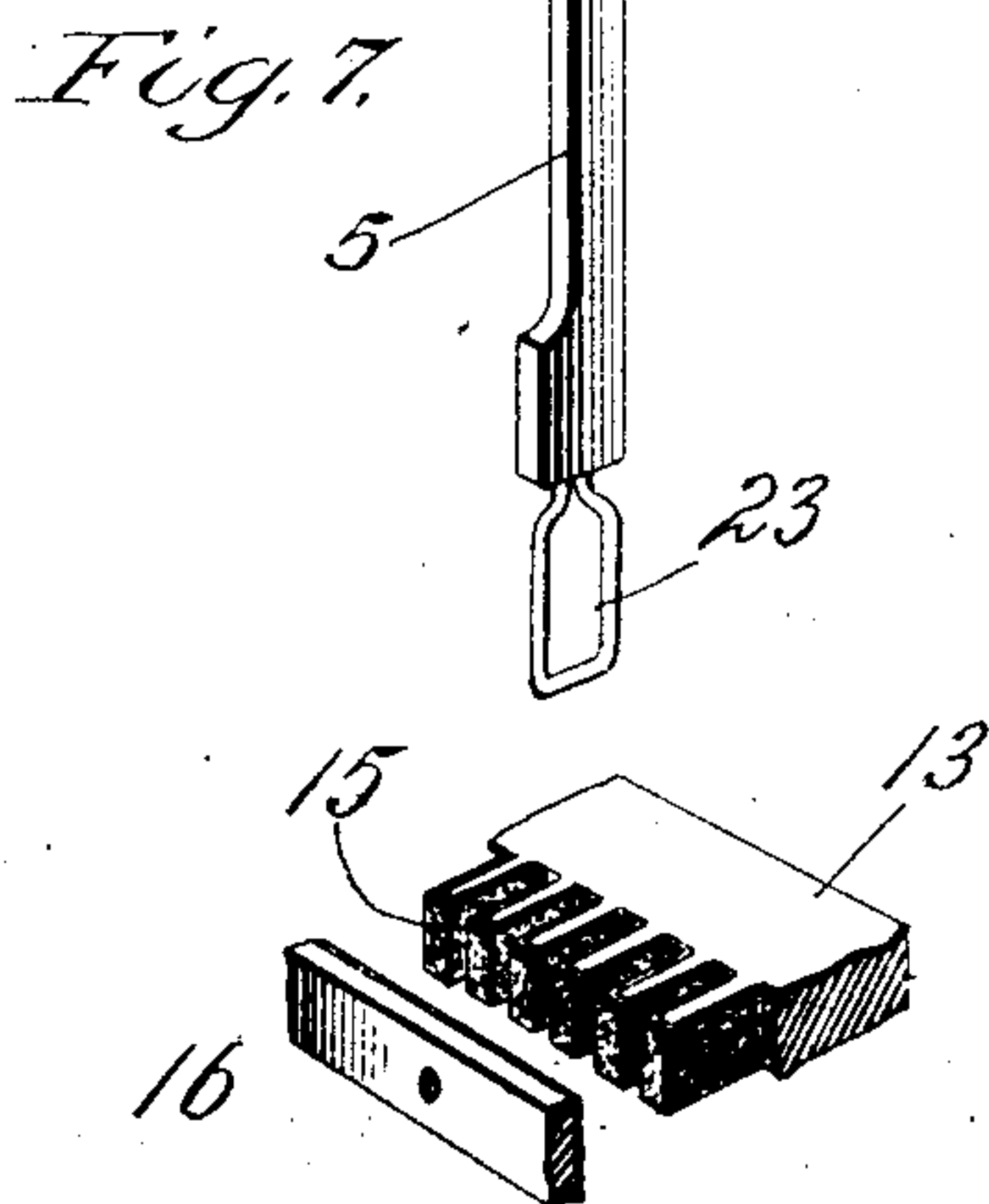
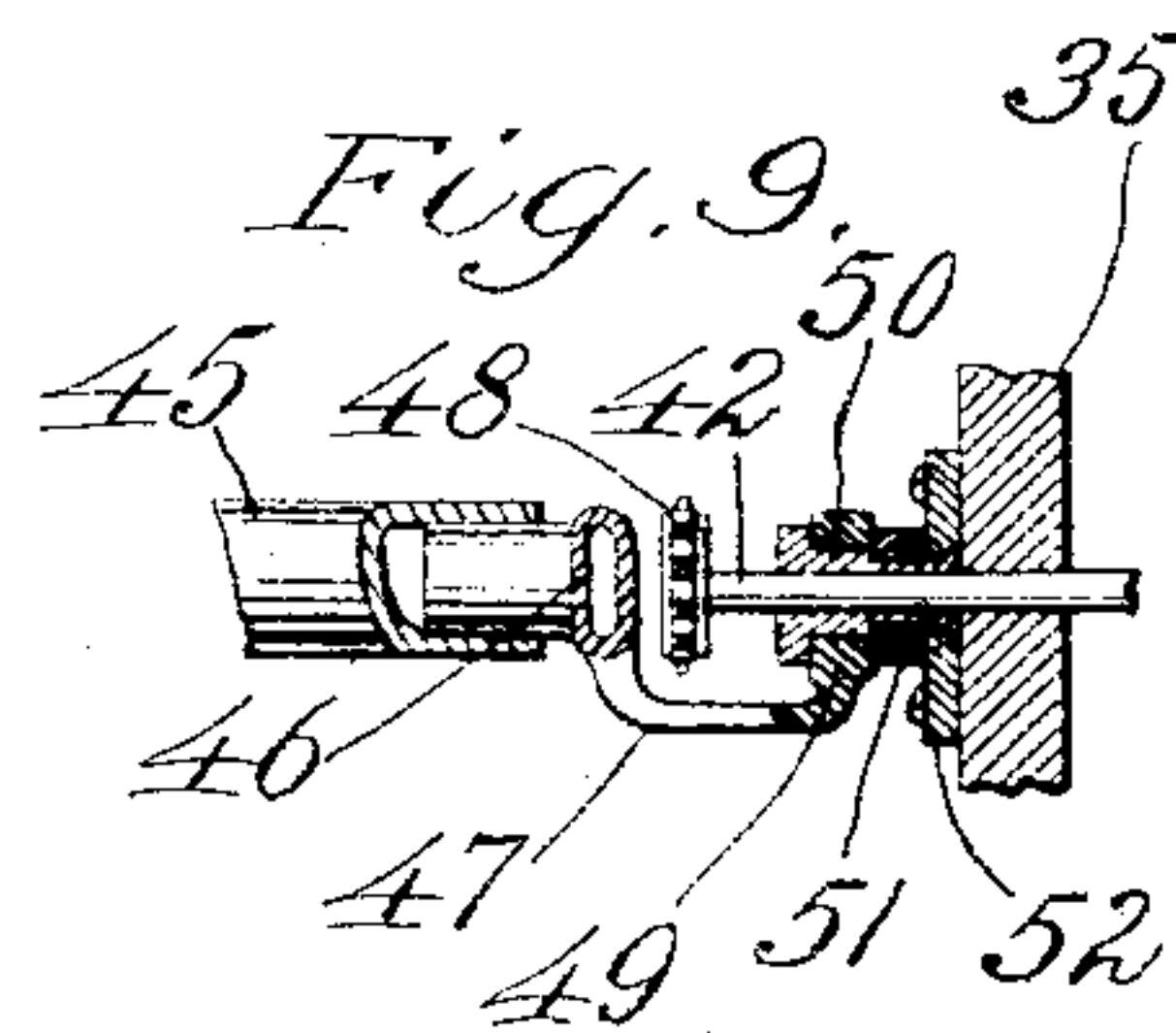
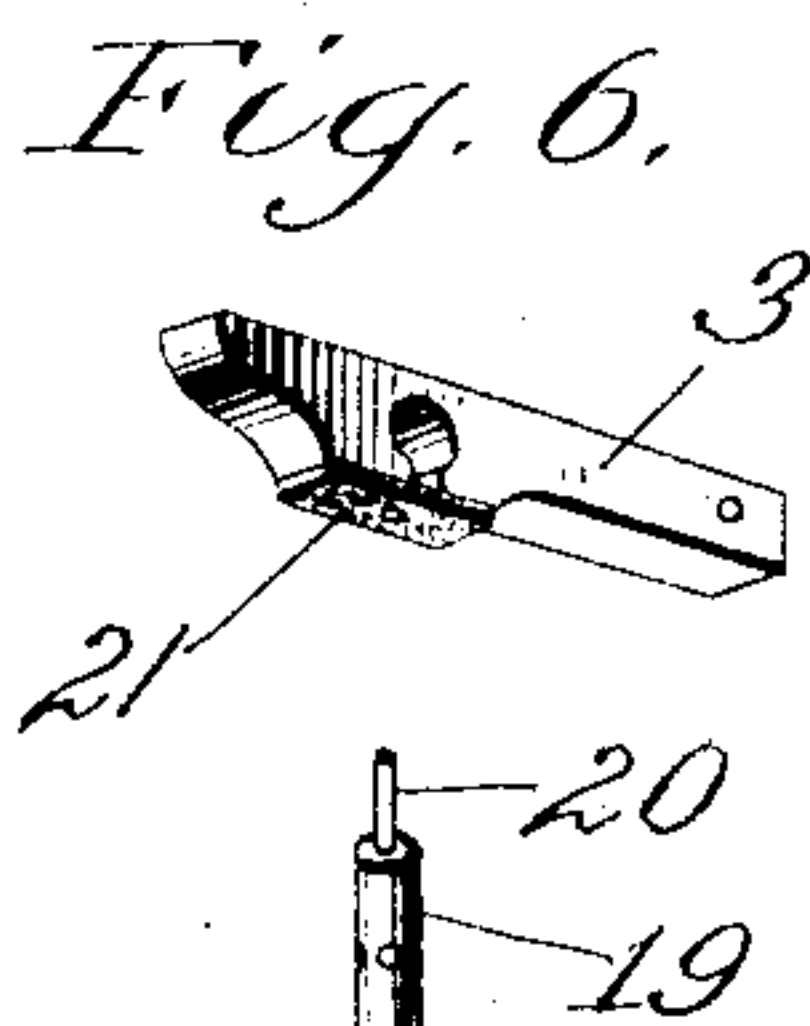
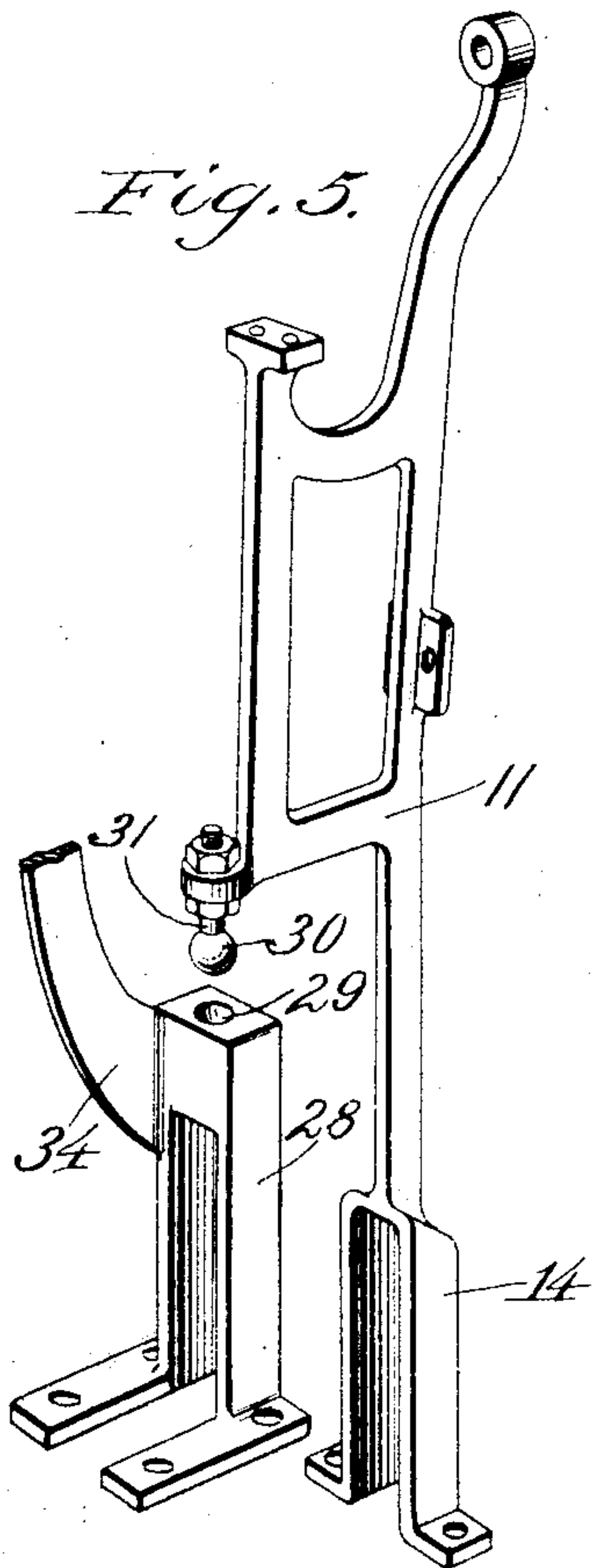
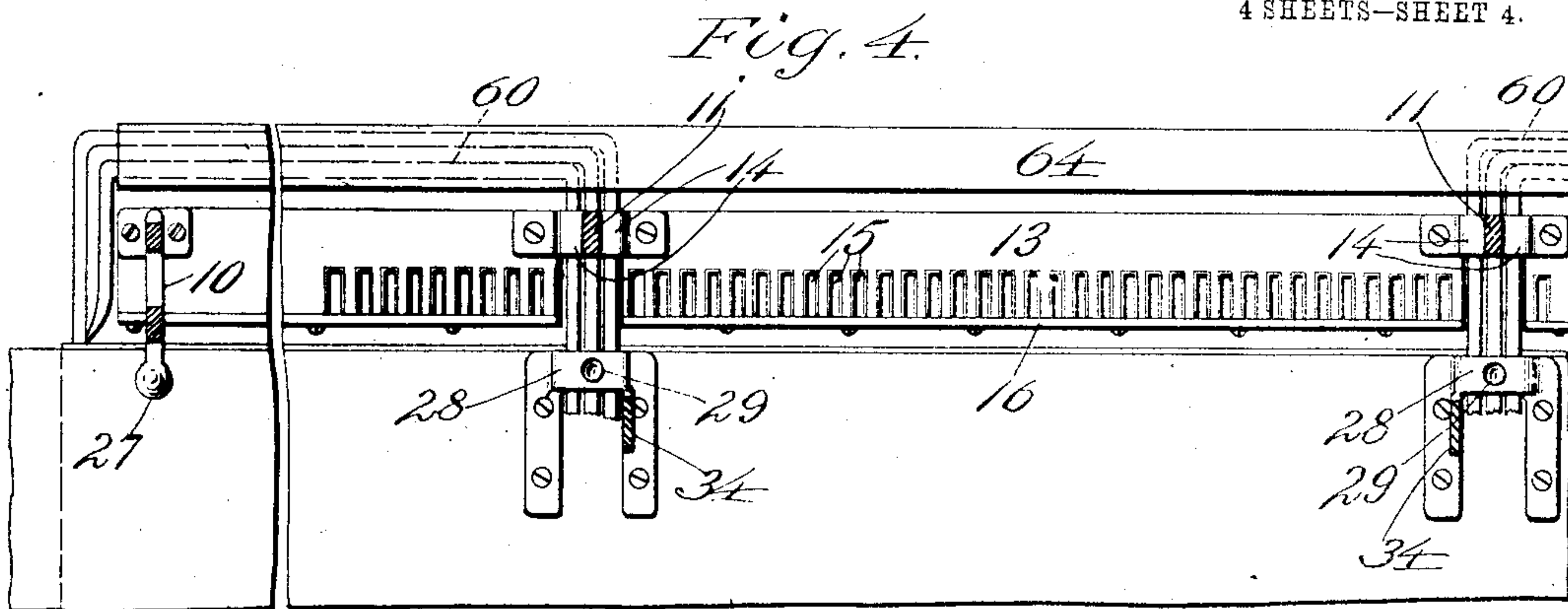
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4 SHEETS—SHEET 4.



Witnesses  
*Albert S. ...*  
*E. R. ...*

Inventor  
*John W. Darley Jr.*  
By *John W. Darley Jr.*  
*Attorneys*



# UNITED STATES PATENT OFFICE.

JOHN W. DARLEY, JR., OF BALTIMORE, MARYLAND, ASSIGNOR TO ERNEST J. KNABE, JR.,  
OF BALTIMORE, MARYLAND.

## COMBINED MANUALLY AND MECHANICALLY OPERATED PIANO.

No. 871,919.

Specification of Letters Patent.

Patented Nov. 26, 1907.

Application filed June 6, 1906. Serial No. 320,472.

*To all whom it may concern:*

Be it known that I, JOHN W. DARLEY, JR., a citizen of the United States, residing at Baltimore city, and State of Maryland, have invented certain new and useful Improvements in Combined Manually and Mechanically Operated Pianos; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to pianos having an auto-pneumatic player incorporated therein. It has reference more especially to that type of such instruments wherein the wippen-actuating rod or abstract is independently-operable either by the key-lever or by a subjacent pneumatic striker, the pneumatics being controlled from a tracker-bar located in front of the action and having air-pipes leading to the pneumatics.

The main object is to simplify and improve the general construction and organization of instruments of this character.

Among other things, the invention provides an improved structure and arrangement of the piano-action and pneumatic playing apparatus, wherein the tracker-bar pipes extend from the tracker-bar in diverging clusters, leaving the front of the piano-action exposed, and are carried down behind the keyboard through the widened spaces between adjacent elements of the action where the intermediate action-brackets are mounted. The mechanism of the action is also simplified, more particularly in respect to the wippen-actuating rod or abstract and the means for maintaining it in proper relation to the wippen, key-lever, and pneumatic striker or lifter.

Another feature of the invention pertains to the music-roll mechanism and the pneumatic operating motor therefor rockingly mounted above the music-roll frame to allow displacement for access to the strings; an improved, simplified and strengthened construction of this character being incorporated in the present instrument.

One preferred embodiment of my invention is illustrated in the accompanying drawings, which form a part of this specification, and with reference to which the invention will hereinafter be fully described, and then more particularly pointed out and defined in the appended claims.

In said drawings, Figure 1 is a vertical cross-section through the instrument, taken at the right of the pneumatic box and right-hand action-bracket, and looking at the opposite or left-hand end of the instrument, showing parts of the interior construction in elevation. Fig. 2 is a vertical cross-section taken through the instrument between the end and intermediate action-brackets, at the right of the music-roll frame, and looking in the same direction as in Fig. 1. Fig. 3 is a fragmentary front view of the interior construction of the instrument, the front portion of the piano-case being removed, and the bed of the keyboard being shown in vertical section; this figure showing the music-roll mechanism, tracker-bar, pneumatic tubes or tracker-bar pipes, the top portion of the wind-chest, and the action-rails and supporting brackets therefor, but showing only two elements of the piano-action. In this figure, intermediate portions are broken away for compactness of illustration. Fig. 4 is a fragmentary plan view showing a portion of the keyboard bottom, a horizontal rail which is attached to the feet of the action-brackets and constitutes a part of the action-frame, and portions of the pneumatic tubes or tracker-bar pipes. Fig. 5 is a perspective view of one of the intermediate action-brackets, together with one of the supporting standards or frames at the front of said bracket upon which the latter is supported. Fig. 6 is a detail perspective of one of the wippens. Fig. 7 is a detail perspective of one of the abstracts or wippen-actuating rods. Fig. 8 is a detail perspective showing a fragment of the lower rail in which the feet of the abstracts are guided, with a detachable front strip of said rail removed. Fig. 9 is a detail plan view, partly in horizontal section, showing the connection between the cranked air-supply pipe for the pneumatic motor and the music-roll frame. Fig. 10 is a detail plan view of one of the swinging arms or braces connecting the music-roll frame with the back frame of the piano-case.

In the case 1 is arranged the conventional piano-action, comprising the hammers 2, their actuating wippens or under-levers 3, with the usual associated devices for effecting the stroke of the hammers and controlling the vibrations of the strings 4; and the wippen-actuating rods or abstracts 5 which are vertically disposed behind and supported



by the key-levers 6, and are independently operable by said key-levers, as well as by the pneumatic strikers or lifters 7 which are arranged to operate on the feet of said abstracts, as hereinafter explained; so that the instrument can be played either manually or mechanically without effect of one instrumentality upon the operation of the other. Said pneumatic strikers or lifters 7 are represented as the ordinary puppets or studs arranged in a longitudinal row and vertically movable in guide-openings therefor in the top of the pneumatic box, which contains the series of pneumatics 9 (shown in Fig. 2) for elevating said strikers when the instrument is being played mechanically.

The piano-action is arranged and mounted on a rigid action-frame, which comprises the outer or end brackets 10, the intermediate brackets 11, arranged in widened spaces between adjacent elements or units of the action, the longitudinal upper action-rail 12 secured to the backs of said brackets, and a lower horizontal rail 13 attached to the feet of depending legs of said brackets. This lower rail 13, disposed behind and below the keyboard, while herein referred to as a single rail, comprises three separate sections of pieces, as shown in Figs. 3 and 4; and the intermediate action-brackets 11 have their depending legs formed as forks or yokes 14 which arch or straddle the spaces between adjacent rail sections and have their feet attached to and rigidly connecting the ends of said rail sections, as will be clearly understood by reference to Figs. 2, 3, 4 and 5.

The upper rail 12 is the usual action-rail, common to piano-actions, the hammers, wippens and associated controlling devices being attached to and supported thereby in the usual manner. The lower rail 13 (whose three sections or parts may be considered as a single rail) has a series of narrow transverse slots 15 therein, constituting guide-ways for the feet of the abstracts 5, as hereinafter explained. The front ends of said slots 15 are formed by the inner side of a strip 16 detachably secured to and constituting a part of the rail, so that upon removal of said strip 16 the ends of the slots 15 are opened to receive the feet of the abstracts. Said slots 15 are moreover interiorly lined or cushioned with felt or appropriate bushing material, the inner side of the strip 16 being lined or covered with similar material.

Considering for convenience one element of the action, it is observed that the abstract 5, disposed behind the key-lever, has a forward projection or lug 17 that bears on an adjustable capstan-screw 18 upstanding at the rear end of the key-lever. At its upper end, the abstract has an adjustable head or cap 19, carrying an upright pin 20, said cap 19 being shown screwed on a threaded stem and provided with lateral holes to receive an

adjusting tool, which can be inserted through or between adjacent elements of the action. Said cap 19 bears under the cloth cushion or felt 21 on the under side of the wippen, and its top pin 20 is inserted through a perforation in said cushion or felt, or stuck through the same, and protrudes into a recess 22 in the wippen, which recess is shown circular with a contracted mouth or slot covered by the felt 21, affording ample clearance to avoid contact of the pin 20 with the walls of said recess as the wippen is rocked by the up and down movement of the abstract. This contrivance guides and maintains the upper end of the abstract in proper relation, providing a pivotal connection with the wippen, but not a positive connection. The abstract moves substantially in a vertical line, its upper end being prevented from lateral motion, though allowed to move slightly back and forward to accommodate itself to a slight arc by reason of the wippen being pivoted or hinged. The cushion 21 is preferably of strong wool cloth. The foot of the abstract consists preferably of a small wire frame 23, rigidly affixed to and constituting a rigid lower end of the abstract. It may be a substantially U-shaped piece having its upper ends brought together and rigidly secured in the lower end of the wood shank of the abstract, the ends of said frame being forced into holes in the bottom of the abstract. The bottom of said wire frame or foot 23 is desirably flattened, as shown in Fig. 7, to provide a flat substantial bearing for the adjacent striker or lifter 7. Said wire foot or frame 23 has a vertically sliding fit in one of the aforesaid felt-lined or cushioned slots 15 of the lower rail 13; thus affording a substantial guide for the lower end of the abstract, preventing turning or lateral or forward or backward movement thereof, while allowing a free up and down movement.

By the foregoing construction, the abstract is held in proper relation with the key, pneumatic striker and wippen, though without positive connection with any of these parts, and the usual guide-links are eliminated, thus dispensing with the necessity of adjusting the centers or pivotal point of connection of such links. At the same time the abstract is independently movable so as to be adjusted with respect to the key and striker, more especially to permit its lug 17 to be set upon the capstan-screw 18 on the rear end of the key-lever, when the instrument is being assembled or adjusted. Moreover, after the piano is assembled, an abstract can be removed from the action by removing the key, lifting the wippen with one hand, and pressing down the abstract with the other until the pin 20 disengages from the hole in the felt 21, when the abstract can be withdrawn from the guide 15.

The action-frame is mounted in place in



the following manner: The outside or end brackets 10 are supported on posts or bolsters 25 screwed in the bed or wood bottom 24 of the keyboard, said posts having surmounting balls 26 on which are seated the socketed or cup-shaped forwardly-projecting feet 27 of said brackets 10, thus providing adjustable bearings for said brackets, the posts or bolsters 25 being adapted to screw up and down in the bed 24 of the keyboard. The intermediate brackets 11 are supported on yoke-shaped standards or frames 28, arranged in front of said brackets so as to straddle the respective groups of tracker-bar pipes, as hereinafter explained, the legs of said standards or frames being affixed on said bed 24 of the keyboard. The tops of said standards or frames 28 are provided with sockets or cups 29, in which are seated the balls 30, which are rigidly but adjustably attached to the forward feet of said brackets 11, said balls 30 being formed at the lower ends of threaded stems or bolts 31 inserted through bolt-holes in the feet of said brackets and secured in place by nuts, so as to provide for vertical adjustment. The upper ends of the several action-brackets are attached to the back frame of the case by means of the usual headed screws 32 tapped into the projecting studs or posts 33 on said back frame. The action-frame is thus mounted by supporting its several brackets on standards or uprights rising from the rear of the keyboard bottom, and securing the upper ends of said standards to the back frame of the instrument; it being observed that the lower rail 13 is attached to the feet of the depending legs of the brackets at the rear of the keyboard. To set the action-frame in place, it is simply necessary to seat the forward feet of the action-brackets upon their respective supporting standards 25 and 28, the standards or posts 25 being first adjusted to proper vertical position, and the balls 30 carried by the feet of the intermediate brackets 11 being also properly adjusted vertically, and then fasten the upper ends of the brackets to the back frame of the instrument, as well understood. To lift out the action, it is only necessary to unfasten the screws 32 at the rear upper ends of the action-brackets and then lift out the whole frame, comprising both the upper rail 12 and lower rail 13, together with the entire action including the hammers, wippens and abstracts mounted in the frame.

In the upper front part of the case is the pneumatic controlling instrumentality or music-sheet mechanism, mounted in the frame 35, and comprising the well-known tracker-bar 36 and perforated web or music-sheet 37 adapted to traverse the same for controlling the admission of air to the ducts of the tracker-bar, the music-sheet being rolled upon the removable music-spool 38

and adapted in operation to unwind therefrom and wind onto the take-up roll 39. Said frame 35, is detachably mounted on arms or brackets 34 extending forwardly and upwardly from the yoke-shaped standards or uprights 28. Mounted upon said frame 35 is the pneumatic motor 40 for operating the music-rolls. Said motor 40 is rockingly supported by a cradle 41 whose arms are pivotally attached at opposite sides of the frame 35 coaxially with the shaft 42 to which rotation is transmitted from the motor shaft 43 by the sprocket-chain 44; said shaft 42 being operatively connected with the music-rolls 38 and 39 by the usual mechanism (not shown) for causing the take-up roll 39 to wind the music-sheet as it travels over the tracker-bar, and the music-spool 38 to rewind the sheet after the music has been played, as well understood. An air current for operating the motor is induced by the bellows or wind-inducing apparatus, through the flexible pipe 45 and the cranked pipe 46, the lower arm of which is in line axially with the axis of the cradle and is coupled or fitted to the flexible pipe 45. Said cranked pipe 46 constitutes one of the supporting arms or sides of the cradle 41, the upper end or arm of said pipe being rigidly connected to the cradle, and the lower end being pivotally connected to the frame 35 by the construction shown in Figs. 3 and 9. In this construction, the cranked pipe 46 has a yoke 47 passing around the sprocket 48 and having a collar 49 surrounding a bushing 50 through which runs the shaft 42, said collar 49 being interposed between the flanged outer end of said bushing and a washer 51 placed against a boss 52 on the side of the frame 35, to which latter the bushing 50 is attached. For holding the cradle 41 rigidly in its normal operative position, a threaded stud 53 is shown projecting from the opposite side of the frame 35, engaging a notch in the supporting arm or side 54 of the cradle, and having a thumb-nut 55 screwed thereon against the said side of the cradle. This arrangement of the motor locates it more compactly and in a more convenient position instead of at the side of the music-frame where it usually obstructs the upper part of the action and strings. When it is desired to have access to the strings or action for adjustment or tuning the thumb-nut 55 can be loosened and the motor can be swung forwardly to the dotted line position indicated in Figs. 1 and 2, the front panel of the piano-case having first been removed. During the operation of swinging the motor forwardly, the flexible pipe 45 twists.

The aforesaid music-roll mechanism and operating motor being supported by the upright narrow frame 35, which is erected upon its bottom plate, block or board 56, it is desirable to brace the upper part of said music-



frame in order to strengthen the same and prevent displacement or breakage during shipment of the instrument. For this purpose I have devised the following construction: A  
5 block 57 secured on the top of frame 35 is pivotally embraced by the forked or bifurcated front end of a brace 58, as by means of pivot-screws passing through the arms of said bifurcated brace and secured into the  
10 block. The rear end of said brace 58 is secured by a screw 59 to the back frame of the instrument, thus affording a rigid brace for the music-frame. When desired, the screw 59 can be unfastened, and the brace can be  
15 swung upwardly and forwardly, after the pneumatic motor 40 has been swung forwardly, as just previously described, thus providing a clear passage for the removal of the action.

20 The air-tubes or tracker-bar pipes 60, affixed to and communicating with the respective ducts of the tracker-bar 36, extend or fan out therefrom in two laterally diverging groups or divisions, as shown in Fig. 3.

25 These groups or divisions of pipes extend oppositely as far or approximately as far as the intermediate action-brackets 11, and are then bent and carried downwardly and rearwardly in narrow compact clusters, passing  
30 through the respective yokes 28 and through or under the corresponding forks 14 of the intermediate brackets 11, thence being carried or distributed to the pneumatics in the pneumatic box 8 below the keyboard. Thus  
35 the pipes are arranged in such manner as to expose practically the entire front of the piano-action, leaving ample access for adjustment, etc.

Both groups of pipes 60 may comprise integral pipe lengths, extending from the  
40 tracker-bar to the opposite ends of the music-roll frame and thence downwardly and rearwardly through the action as above described, but in the illustrated construction both groups  
45 are arranged in detachably-connected sections or divisions, which for convenience may be referred to as primary and secondary pipe lengths, the secondary pipe lengths being continuations of the primary pipe lengths.

50 The primary pipe lengths extend from the tracker-bar 36 to the opposite ends of the plate, block or board 56 on which the music-roll frame is erected, the ends of said primary pipe lengths being distributed fan-like along  
55 the widths of said board and being cemented or otherwise affixed in ducts or openings therein. Said ducts in the ends of the board 56 register with ducts in subjacent blocks 61, which are detachably clamped across the  
60 bottoms of the ends of the board or blocks 56, flat packings being interposed to insure non-leakage of air. In the latter blocks 61 the upper ends of the secondary pipe lengths are cemented or affixed, so that the second-  
65 ary pipe lengths constitute continuations of

the primary pipe lengths. The blocks 61 are shown screwed or otherwise detachably but rigidly affixed to vertical flanges 63 of the arms or brackets 34, while the bottom board or block 56 is similarly attached on the hori- 70  
zontal flanges 62 of said arms or brackets. This construction is similar to one employed in an instrument shown in my copending application Serial No. 277,989, filed  
September 11, 1905; though it is not essen- 75  
tial to the present invention, for, as before noted, the air pipes may consist of integral pipe lengths as disclosed in another instrument shown in my copending application  
Serial No. 290,794, filed December 7, 1905. 80

The arrangement of distributing the tracker-bar pipes to the pneumatics in the wind-chest 8 is similar to that employed in the instrument illustrated in my aforesaid  
application Serial No. 290,794, the two 85  
groups of pipes, after passing through the lower part of the action, being carried horizontally toward the opposite ends of the instrument as far as the ends of the wind-chest, and thence being carried downwardly 90  
at opposite ends of the wind-chest and detachably connected to continuing pipe lengths (which for convenience may be termed tertiary pipe lengths), said tertiary  
pipe lengths being supported in removable 95  
grids or frames and being in communication with the pneumatics within the wind-chest. The horizontal runs of the two groups of pipes 60, behind the action-brackets, are in-  
closed in and supported by a narrow longi- 100  
tudinal tube 64, arranged horizontally between the action-brackets and the strings 4, and affixed to and supported on brackets 65 attached to the back frame of the case; said  
brackets 65 being arranged between the 105  
breaks or spaces between the sections of rail 13, so that the forks 14 of the intermediate action-brackets 11 straddle said brackets 65 as well as the groups of tracker-bar pipes  
above the same, allowing the action frame to 110  
be set down in place or to be lifted out without interference. The length of said horizontal tube 64 is desirably commensurate or approximately commensurate with the length  
of the wind-chest 8, and the two groups of 115  
tracker-bar pipes inclosed in said tube extend to and out from its ends, and are thence bent downwardly and at the same time forwardly, and have their lower ends distrib-  
uted to ducts in the vertical boards 66, the 120  
ends of said pipes being cemented or otherwise affixed in said ducts. Said vertical boards 66 are detachably secured to the aforesaid grids, designated by the numeral  
67, holding the tertiary pipe lengths 68, 125  
which register with the pipe lengths 60.

As described in my aforesaid application Serial No. 290,794, the wind-chest has a removable or detachable front plate 69, whose  
ends project beyond the opposite ends of the 130



wind-box, and the grids 67 are rigidly affixed to the back side of the ends of said front plate 69, extending rearwardly beside the ends of the wind-chest. The tertiary pipe lengths 68 have their ends cemented in or otherwise affixed in the ducts or back boards 70 of the grids, which ducts register with those in the boards 66, and said pipe lengths 68 pass from the grids along the inside of the front plate 69, which front plate is recessed to receive said pipes; and inside the wind-chest the pipes connect respectively with the pneumatics corresponding to the respective ducts of the tracker-bar. It is observed that the arrangement is such that both groups of the tracker-bar pipes 60, supported in the tube 64, can be lifted out after the action-frame is removed, by unfastening the boards 66 from the back boards 70 of the grids.

The wind-chest or vacuum-box 8 is of course in connection with any suitable wind-inducing apparatus, such as the usual bellows operated by the performer's feet, which also furnishes power through the aforesaid pipe 45 and cranked pipe 46 for operating the pneumatic motor 40 which runs the music-sheet, all of which is so well known that specific representation and further explanation thereof will be unnecessary.

Having thus fully described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:—

1. In a combined manually and mechanically operated instrument, the combination of a piano-action including the hammer and wippen, said wippen having a cushion of appropriate material on its under-side and having also a recess with a contracted mouth extending to the under side of the wippen and covered by said cushion, a vertically-disposed abstract or wippen-actuating rod whose head bears under said cushion and carries an upright pin inserted through said cushion and into said recess, there being sufficient clearance to avoid contact of said pin with the walls of said recess, a key-lever and mechanical striker both arranged for operating on or lifting said abstract, and means for holding the abstract in proper relation to said key-lever and striker.

2. In a combined manually and mechanically operated instrument, the combination of a piano-action including the hammer and wippen, a key-lever, an abstract vertically-disposed behind the rear end of the key-lever and supported and liftable thereby, a mechanical striker arranged to operate on the foot of said abstract, there being no positive connection between said abstract and key-lever or striker, said abstract carrying at its upper end a pin pivotally-seated in the under side of the wippen and constituting a guide for the upper end of the abstract, and a fixed guideway in which the lower part of the ab-

stract is slidably fitted to allow an up and down movement.

3. In a combined manually and mechanically operated instrument, the combination of a piano-action including the hammer and wippen, said wippen having a recess therein and having a cushion covering the mouth of said recess on the under side of said wippen, an abstract whose head bears under said cushion and is provided with a pin inserted through said cushion and into said recess, a key-lever, means whereby said abstract is supported at an intermediate point by the key-lever, a fixed member having a guideway in which the foot of the abstract is fitted to slide vertically, and a mechanical striker arranged to operate on the foot of said abstract.

4. In a combined manually and mechanically operated instrument, the combination of a piano-action including the hammer and wippen, a key-lever, an abstract vertically-disposed behind the rear end of the key-lever and supported thereby, the head of said abstract being pivotally seated against the under side of the wippen, the lower end of said abstract having a rigid frame secured thereto constituting the foot of the abstract, a rail having a transverse slot in which said frame is fitted to allow only an up and down movement, and a mechanical striker arranged to operate on the bottom of said foot of the abstract.

5. In an instrument of the character described, the combination of a series of vertically-disposed abstracts or wippen-actuating rods whose feet consist of rigid wire frames, a horizontal rail having a corresponding series of transverse slots constituting guide-ways for said feet, key-levers arranged to operate on the abstracts above said rail, and mechanically-actuated strikers arranged to operate on the feet of said abstracts below said rail.

6. In an instrument of the character described, the combination of a series of vertically-disposed abstracts or wippen-actuating rods whose feet consist of rigid wire frames with flattened bottoms, a horizontal rail having a corresponding series of transverse slots in which said feet are slidably fitted and guided, said rail having a detachable strip forming end-walls of said slots, key-levers operating on said abstracts above said rail, and mechanically-actuated strikers operating on the feet of said abstracts below said rail.

7. In a combined manually and mechanically operated instrument, the combination with the keyboard bottom, of an action-frame comprising an upper action-rail and a plurality of action-brackets attached thereto and mounted on said bottom and having depending legs behind said bottom and a lower rail attached to the feet of said legs, an action mounted in said frame comprising hammers



and wippens pivotally-connected to the upper action-rail and wippen-actuating rods or abstracts connected with said lower rail so as to be freely movable up and down, key-levers  
5 arranged to operate on said abstracts, and mechanically-actuated strikers arranged to operate on the feet of said abstracts below said lower rail.

8. In a combined manually and mechanically operated instrument, the combination of  
10 the keyboard bottom, an action-frame mounted on the rear of said bottom having an upper action-rail and having a lower action-rail behind said bottom, said lower rail  
15 having a series of transverse slots therein, an action mounted in said frame comprising hammers and wippens connected to said upper rail and wippen-actuating rods or abstracts whose feet are slidably fitted and  
20 movable up and down in said slots in said lower rail, a series of key-levers, the abstracts being vertically-disposed behind the rear ends of said key-levers and supported thereby but not positively-connected therewith,  
25 and a series of pneumatic strikers arranged to operate on the feet of said abstracts below said lower rail, there being no positive connection between said abstracts and strikers.

9. In an autopneumatic instrument, the  
30 combination of a music-roll frame, a bottom support therefor upon which said frame is mounted, a fixed member in the instrument, and a connecting brace between said frame and member, which brace is pivotally-attached to one and is detachably-fastened to  
35 the other, allowing the brace when its detachable end is unfastened to be swung out of position.

10. In an autopneumatic instrument, the  
40 combination of an upright music-roll frame, a support therefor on which said frame is mounted, a block attached on the top of said frame, and a brace having a forked end embracing and pivotally-connected with said block  
45 and having its opposite end detachably fastened to a fixed member within the piano-case.

11. In an autopneumatic instrument, the combination of music roll mechanism, a frame  
50 therefor, a pneumatic operating motor for said mechanism rockingly mounted above said frame, an air-supply pipe, and a pipe coupled therewith and connected with said motor, said pipe being also pivotally attached to the side of said frame and constituting a  
55 rocking or swinging support for said motor.

12. In an autopneumatic instrument, the combination of a pneumatic motor for operating music-winding devices, a rocking cradle supporting said motor and allowing the  
60 same to swing bodily, an air-pipe arranged substantially coaxial with the axis of said cradle, and a pipe connecting said air-pipe and motor and constituting a supporting arm of said cradle.

65 13. In an autopneumatic instrument, the

combination of a music-roll frame, an operating shaft for music-winding devices mounted therein and having a gear-wheel at the side of the frame, a superimposed pneumatic motor whose motor-shaft is geared with said  
70 wheel on said operating shaft, a cradle rockingly-mounted on said frame and holding said motor, an air-supply pipe in line with the axis of said cradle, a pipe connecting said air-supply pipe and motor, said pipe having  
75 a rigid yoke-like arm passing around said wheel of the operating shaft and having a pivotal bearing on said shaft, whereby said pipe constitutes a rocker-arm of the cradle.

14. In an autopneumatic instrument, the  
80 combination with the key-levers and keyboard bottom, of yokes mounted on the rear of said bottom, an action-frame comprising an upper rail and lower rail which latter is composed of separate sections and action-  
85 brackets attached to said upper rail and having forks whose legs are attached to adjacent ends of the sections of said lower rail, said brackets being mounted or supported on said yokes with the aforesaid forks depending behind said yokes, an action mounted in said  
90 frame comprising hammers and wippens connected to the upper rail and abstracts connected to or held in position by said lower rail, said abstracts being supported by said  
95 key-levers, strikers arranged to operate on the feet of said abstracts, a tracker-bar in front of the action, tracker-bar pipes branching therefrom in groups which are carried in clusters or bunches rearwardly through said  
100 yokes and through or under said forks, and pneumatics below the keyboard to which the lower ends of said pipes are respectively distributed, said pneumatics being operatively connected with said strikers.  
105

15. In an autopneumatic instrument, the combination of a piano-action, action-brackets having passages therein, said passages having open bottoms, the manual keys, a  
110 pneumatic-playing apparatus, a pneumatic controlling mechanism in front of the action, and pneumatic tubes or pipes extending therefrom to the said pneumatic-playing apparatus, said pipes being arranged in clusters or bunches and carried through said  
115 passages in said action-brackets to the pneumatic-playing apparatus.

16. In an autopneumatic instrument, the combination with the keyboard, of a yoke mounted rearwardly thereon, an action-  
120 bracket mounted on said yoke having a rearward depending fork, and a bunch or cluster of tracker-bar pipes extending through said yoke and through or under said fork.

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

JOHN W. DARLEY, JR.

Witnesses:

HERMAN E. AHRENS,

CHARLES R. BOETTGER.