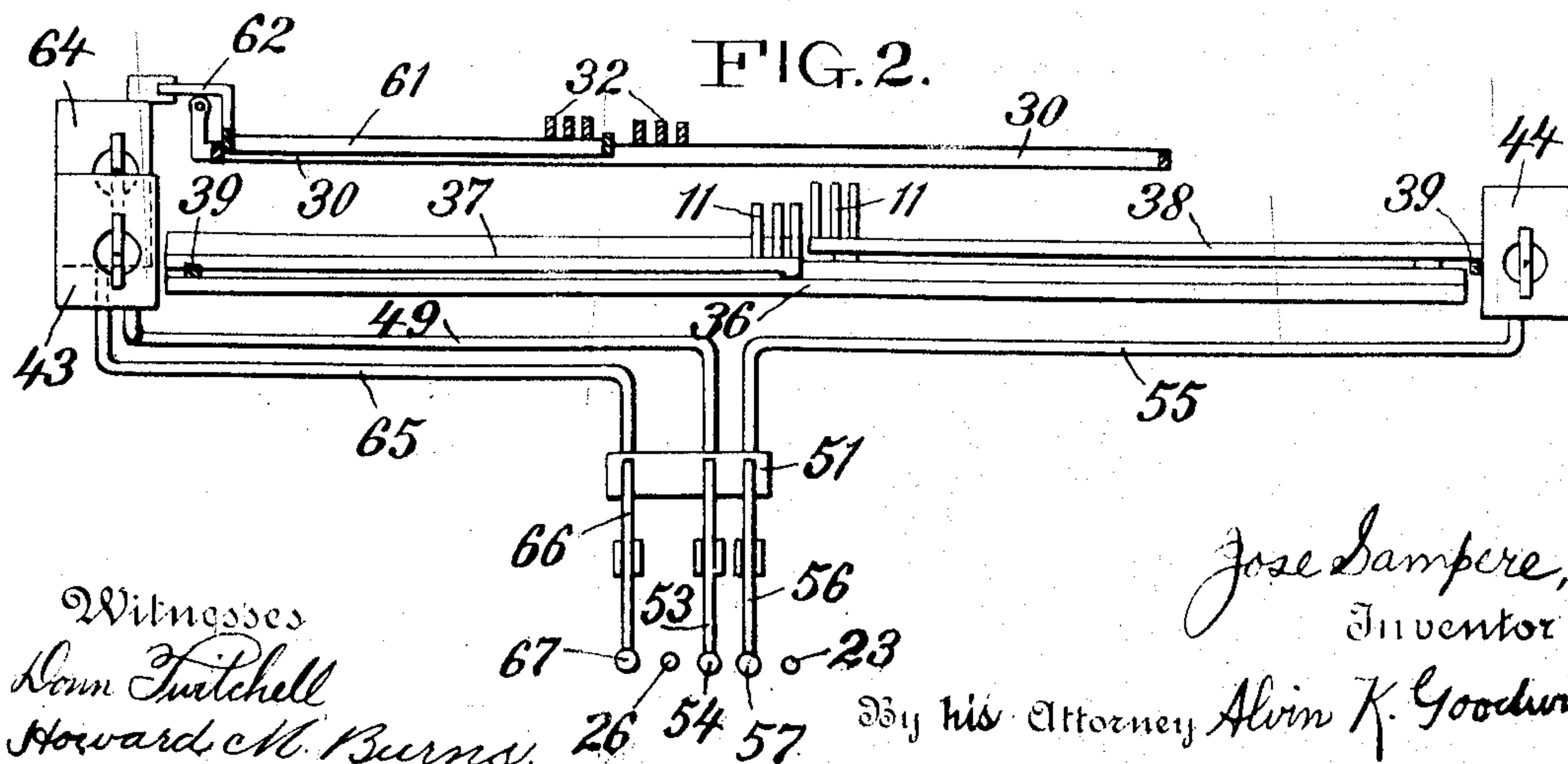
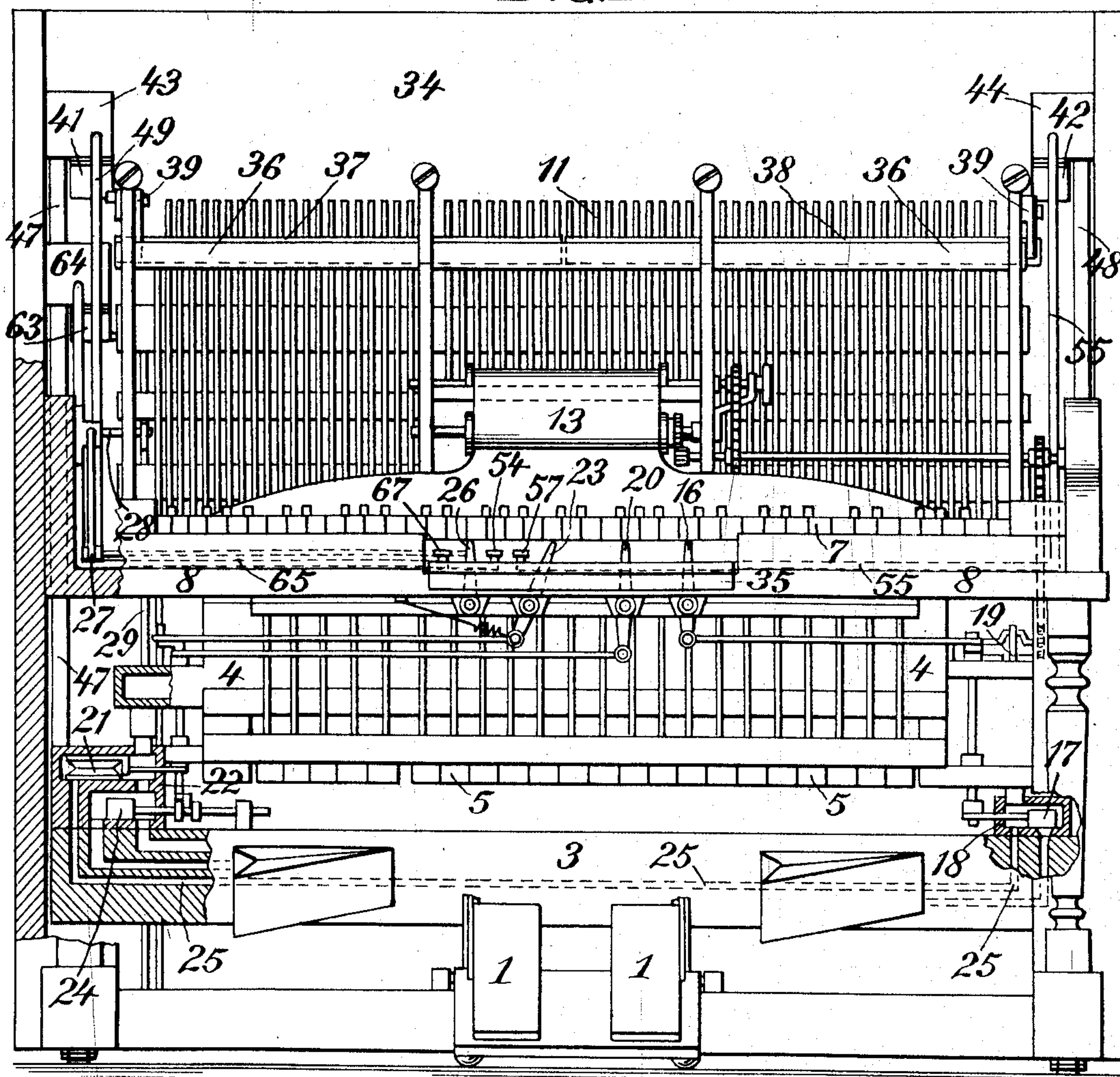


PATENTED FEB. 13, 1906.

APPLICATION FILED AUG. 15, 1904..

3 SHEETS—SHEET 1.

FIG.1.



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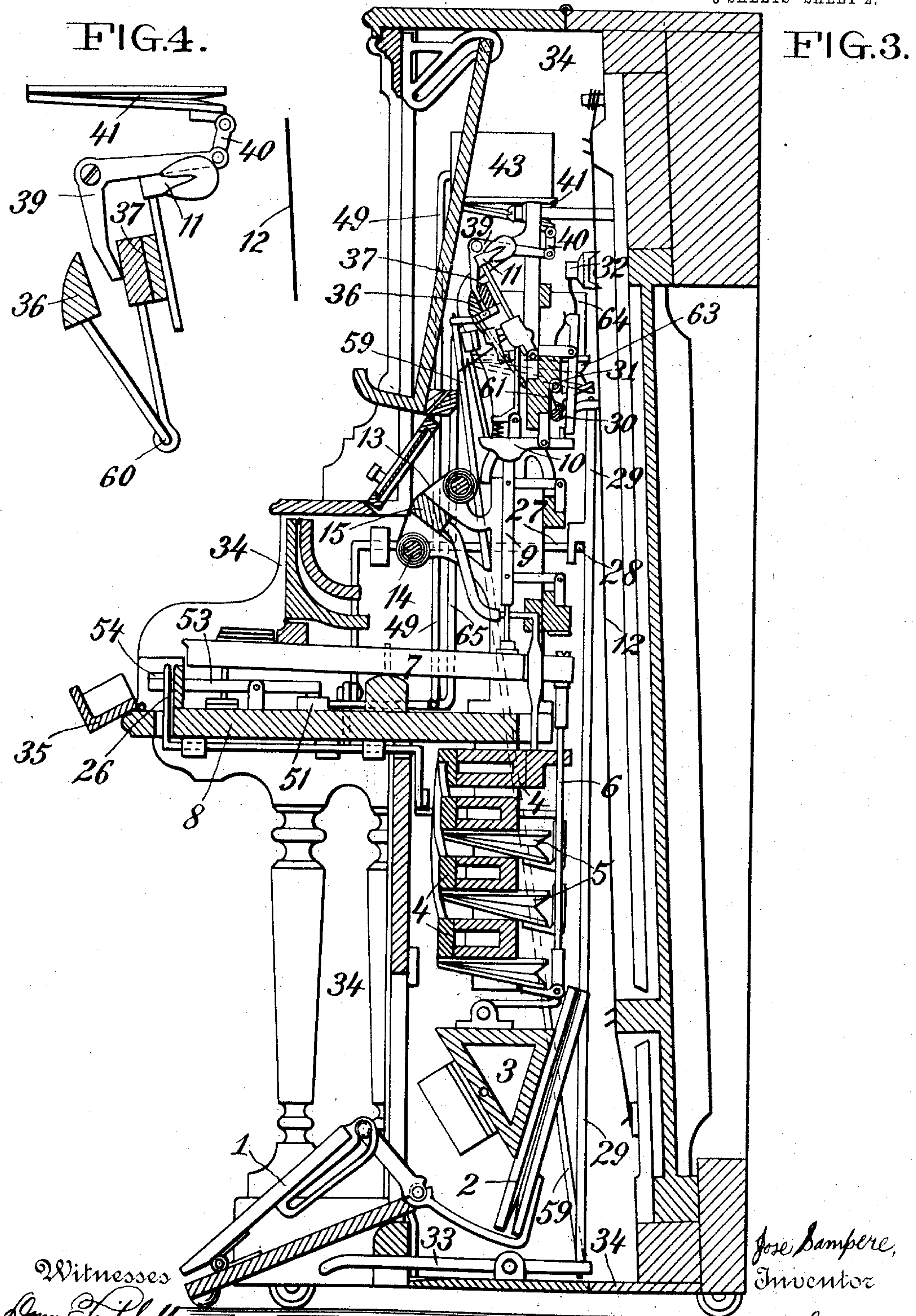
PATENTED FEB. 13, 1906.

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TONE MODULATING DEVICE FOR PIANOS.

APPLICATION FILED AUG. 15, 1904.

3 SHEETS—SHEET 2.



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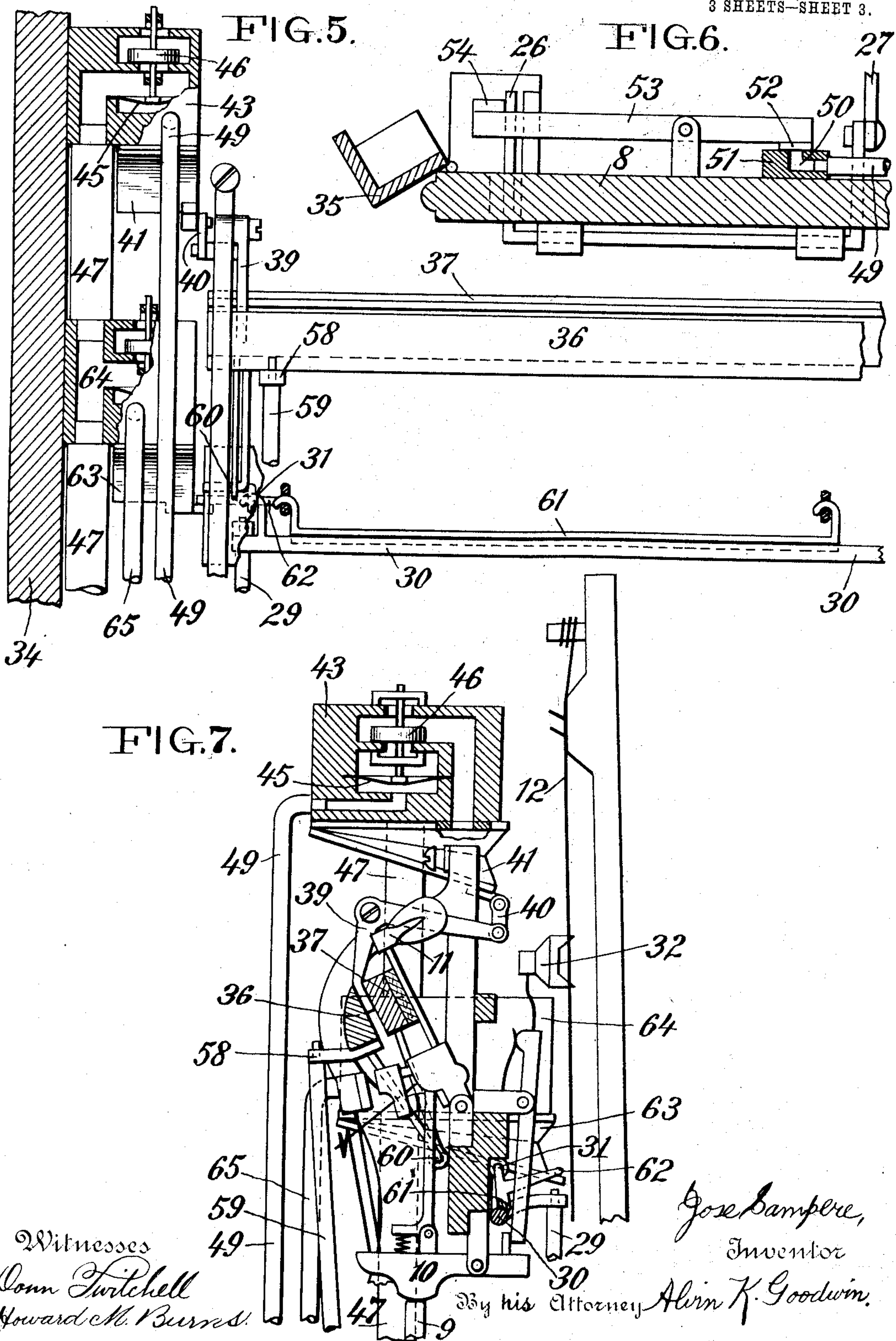
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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

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TONE-MODULATING DEVICE FOR PIANOS.

No. 812,237.

Specification of Letters Patent.

Patented Feb. 13, 1906.

Application filed August 15, 1904. Serial No. 220,800.

To all whom it may concern:

Be it known that I, JOSE SAMPERE, a subject of the King of Spain, residing at the city of New York, State of New York, have invented certain new and useful Improvements in Tone-Modulating Devices for Pianos, of which the following is a specification.

This invention relates to improvements in tone-modulating devices, more especially as applied to self-playing pianos operative pneumatically and adapted also to be played manually.

The invention has for its object to provide for production of a wide range of pleasing or blended tone effects. This is accomplished by means of compound or divided constructions of the piano-action hammer rest-rail and of the string damper-rail, which are easily operated, preferably by depressing push-buttons on valved levers intentionally located near the ordinary mechanical playing-stops of the piano to permit manipulation of the improved rest-rail and damper-rail tone-modulating devices and of the ordinary expression and forte mechanical playing-stops by one hand of the performer, whose other hand is free to control the ordinary tempo regulating-stop of the instrument.

The invention will first be described and then will be particularly defined in claims hereinafter set forth.

Reference is made to the accompanying drawings, forming part of this specification, and in which—

Figure 1 is a partly-sectional front elevation of a piano embodying the invention with the action represented diagrammatically and parts of the casing removed. Fig. 2 is a detail partly-sectional plan view illustrating the compound hammer rest-rail and the auxiliary damper-rail with their preferred pneumatic-operating devices and preferred controlling means. Fig. 3 is a central vertical sectional view of the piano as adjusted for mechanical playing. Fig. 4 is a detail vertical sectional view illustrating pneumatic operation of the inner bass portion of the hammer rest-rail. Fig. 5 is an enlarged front sectional view showing the left-hand portions of the rest-rail and the damper-rail and their connections for pneumatic and foot-pedal operation. Fig. 6 is an enlarged detail central vertical section illustrating the grouped mechanical playing-stops and the valved levers

pneumatically controlling the rest-rail and the damper-rail, and Fig. 7 is an enlarged vertical sectional side view showing the rest-rail and the damper-rail and their adjacent pneumatic attachments.

In the manually or mechanically operated piano shown in the drawings and embodying this invention the pedals 1 operate air-pumping bellows 2, held to a main wind-chest 3, with which communicate the valved air-chests 4 of series of striking-pneumatics 5. These pneumatics in collapsing lift abstracts 6, which raise the inner ends of the piano-keys 7, fulcrumed on a key-table 8, and raise the key-operating rods 9, which lift the wippens 10 and throw the action-hammers 11 to the piano-strings 12 for playing the instrument mechanically. The pneumatics 5 are controlled by a perforated music-sheet 13, running on rolls 14 over a tracker 15, communicating by air tubes and passages with the striking-pneumatic valves and the main wind-chest. A tempo-lever stop 16 by suitable connections may operate a valve 17 in the chest 18, communicating with the motor 19 for controlling speed of travel of the music-sheet 13, operated by the motor. A reroll-lever stop 20 by suitable connections may operate a valve 21 in one chamber of a chest 22, communicating with the striking-pneumatic chests 4 and the main wind-chest 3, so as to cut off the chests 4 to silence the mechanical playing during rewinding of the music-sheet. An expression lever-stop 23 by suitable connections may operate a valve 24 in another chamber of the chest 22 to more or less close the air-passage between the chests 3 4, and thus control the force of the blows of the collapsing pneumatics 5 for regulating the volume of tones during mechanical playing. There is an air-passage 25 along the main wind-chest 3 and between the motor-valve chest 18 and the expression and reroll-valve chest 22. Said passage 25 when the valve 21 is moved to cut off the chambers 4 from the chest 3 is opened to give full air-current to the motor for quickly rewinding the music-sheet. A forte lever-stop 26 by suitable connections including a rocking-shaft arm 27, having a bent end 28, may be operated to lift the pedal-rod 29, and thereby swing the damper-rail 30 rearward on its pivots 31 to throw all the dampers 32 from the piano-strings 12 to obtain louder tones along

the whole scale during mechanical playing, and the same effect may be produced during manual playing by operating the ordinary loud pedal 33 at the lower front rail of the piano-case 34. All of the stops-16 20 23 26 are preferably arranged in a recess of the piano-case front below the keyboard 7, and a cover 35, preferably hinged, is provided to conceal said stops during manual playing of the instrument.

All the above-named parts 1 to 35 are substantially similar to those shown and described in a prior concurrent application for Letters Patent. The above brief description of their operation is given to facilitate clear understanding of the present invention in tone-modulating devices, and more particularly as regards the special location and effects of the preferred valved levers having push-buttons and causing operation of the tone-modulating devices relatively to or with the expression and forte stops 23 26.

The improved tone-modulating devices comprise, first, a compound or divided hammer rest-rail and preferred pneumatic devices for operating its two inner face portions independently for producing subdued bass or treble tone effects during mechanical playing, while permitting simultaneous adjustment of both bass and treble portions of the rest-rail by operating the ordinary soft pedal during manual playing; second, a compound or divided damper-operating rail permitting the bass-string dampers to be operated by preferred pneumatic devices independently of the treble-string dampers for giving improved sostenuto bass-tone effects during mechanical playing, while allowing simultaneous operation of all the dampers by the ordinary loud pedal during manual playing; third, a system of stops, preferably in the form of levers carrying push-buttons and arranged near the expression and forte mechanical playing-stops, to permit control of both adjustable face portions of the divided hammer rest-rail and the bass portion of the damper-rail by or from said valved levers, while allowing simultaneous manipulation of said expression and forte stops by the same hand of the performer, whose other hand thus is free for adjusting the tempo controlling-stop. A special cover conceals the mechanical-playing stops and rail-controlling levers during manual playing of the instrument.

It is preferred to make the compound hammer rest-rail with a main full-length outer or front rail portion 36 and two inner or rear felt-faced portions 37 38, hinged suitably to part 36 and each preferably extending half-way along the piano-action. Near the outer end of each rail portion 37 38 is hinged to the action-frame or other support an elbow-lever 39, one end of which may engage the front of the rail portion 37 or 38 to permit it to swing said rail portion rearward toward the strings

12 with the hammers resting upon it. The other ends of the levers 39 are preferably coupled, as by links 40, with movable walls of respective pneumatics 41 42, held to chests 43 44, suitably fastened in the piano-case. These chests 43 44 each have air-chambers in which are arranged a primary pneumatic or diaphragm 45, adapted to lift a valve 46, thereby cutting off the pneumatic 41 or 42 from the atmosphere and opening the pneumatics to air-suction induced through pipes 47 48, connecting the respective chests 43 44 with the main wind-chest 3. The chest 43 is connected by a tube 49 with an orifice 50 in a duct-board 51, held preferably to the key-table 8, and this orifice is normally closed to the atmosphere by a valve 52 on a lever 53, fulcrumed on the table 8 and carrying a push-button 54. (See Figs. 1, 2, and 6 of the drawings.) A tube 55, leading from the other chest 44 to the duct-board 51, connects with another orifice therein controlled by a valve on a second lever 56, carrying a push-button 57. These two lever push-buttons 54 57 are arranged, preferably, between the expression and forte stops 23 26 or otherwise near enough to them to permit convenient operation of both valved levers and both stops by the left hand of the performer. The full-length outer portion 36 of the hammer rest-rail has the usual projecting lip 58, which is engaged by a rod 59, leading upward from the ordinary soft-pedal of the piano. If during manual playing of the piano the soft-pedal be operated to raise the rod 59, it is obvious that the entire compound rest-rail 36 37 38 will be swung rearward on its pivot-joints 60 to carry all the hammers 11 nearer the strings 12 for assuring softer tones along the whole scale. As the entire rest-rail thus is moved rearward, the pneumatics 41 42 will collapse without appreciable resistance, as they then are open to the atmosphere. If during mechanical playing it is desired to soften the bass or treble tones, the push-button 54 or 57, respectively controlling the valves of the pneumatic 41 or 42, will be pressed, thereby opening the respective tube 49 or 55 to the atmosphere and operating the communicating pneumatic-valves and causing collapse of the corresponding pneumatic 41 or 42 by the air-exhaust. This causes the elbow-lever 39 of said pneumatic to move the inner face-section 37 or 38 of the compound rest-rail rearward and carry only the corresponding hammers 11 nearer the strings 12 to soften either the bass or treble tones. When the button 54 is depressed, the rail-section 37 is moved to soften the bass tones and when the button 57 is depressed the rail-section 38 is moved to soften the treble tones. These operations are indicated in Figs. 4 and 2 of the drawings.

The damper-operating rail 30 has pivoted at its bass end an auxiliary rail portion 61,

carrying an arm 62, which overlies a projection on the lower movable wall of a pneumatic 63, which is fastened to a valve-chest 64, containing valves like those in the two chests 43 44 above mentioned. This chest 64 is shown interposed in the pipe 47, leading from the chest 43 above it to the main wind-chest 3, so as to have the pneumatic mechanism of both chests operate by air-current through the same pipe 47; but the chest 64 may have its own independent pipe connection to the chest 3. From the chest 64 a tube 65 leads to a third orifice in the duct-board 51, which is controlled by a valve on a third lever 66, carrying a push-button 67, preferably arranged near the forte-stop 26, so as also to be conveniently operated by the left hand of the performer. If during manual playing of the instrument the loud pedal 33 be depressed, the entire full-length rail 30 will be swung on its pivots 31 to throw all the dampers 32 away from the piano-strings 12 to obtain usual forte or sostenuto tone effects throughout the whole scale. It may be preferable to have the auxiliary damper-rail portion 61 stop against the full-length rail 30, so that both rail portions 30 31 will swing together as the rod 29 is lifted by the loud pedal 33. If forte or sostenuto bass tones are desired during mechanical playing these may be obtained by simply depressing the push-button 67, thereby admitting atmospheric air through the corresponding orifice of the duct-board 51 and thence through the tube 65 to the chest 64 to actuate the valves therein, and thus cause operation of the pneumatic 63, which in collapsing will swing only the auxiliary damper-rail portion 61, and thereby throw only the bass-dampers 32 from the piano-strings 12 to assure forte or sustained bass tones. It is obvious that by operating this auxiliary bass-damper-rail portion 61 simultaneously with the operation of the treble auxiliary hammer-rest-rail section 38 various novel and pleasing tone effects may be produced, as the softened treble tones will be in strong contrast with the forte bass tones. Furthermore, a great variety of blended harmonious tone effects may be produced by either simultaneous or alternating manipulation of the expression-stop 23 or the forte-stop 26 relatively to any one or more of the push-buttons 54 57 67, controlling the

rest-rail and damper-rail tone-modulating devices, thereby assuring an unusual range or variety of tone modulation and permitting automatic playing, which may with difficulty, if at all, be distinguished from the manual playing of expert performers. The push-buttons 54 57 67 are hidden during manual playing by the same cover 35, which conceals the mechanical playing-stops 16 20 23 26.

Various modifications of this invention may be made by the skilled mechanic—as, for instance, the inner face portions 37 38 of the hammer rest-rail and the auxiliary bass portion 61 of the damper-rail may each or all be operated otherwise than pneumatically, and the strings 12 may be substituted by other devices producing musical tones when struck by the action-hammers. The details of construction also may be variously and materially changed without departing from the spirit and scope of the invention expressed in the appended claims.

I claim as my invention—

1. In a piano, a continuous rail extending transversely of the strings, a sectional rail spaced from said continuous rail and extending parallel therewith, and pneumatically-operated devices for moving the sections of the second-named rail individually, the actuating portions of said devices being arranged between the continuous rail and the sectional rail.

2. In a piano, a continuous rail extending transversely of the strings, a sectional rail spaced from said continuous rail and extending parallel therewith, and pneumatically-operated devices for moving the sections of the second-named rail individually, the actuating portions of said devices being arranged between the continuous rail and the sectional rail, and an operating device for the continuous rail, the actuating portions of said device being located on the side of the said rail opposite to that on which the first-named operating devices are placed.

Signed at the city of New York, State of New York, this 13th day of August, 1904.

JOSE SAMPERE.

Witnesses:

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ALVIN K. GOODWIN.