E. C. HISCOCK.

PLAYER PIANO.

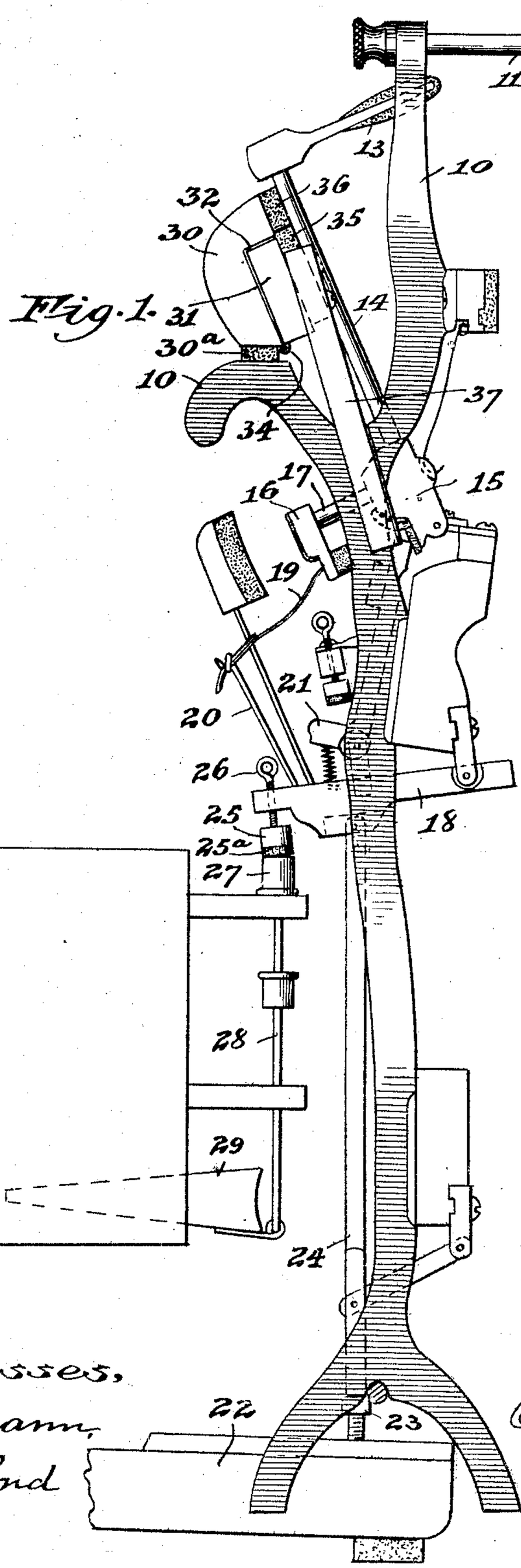
APPLICATION FILED NOV. 24, 1909.

974,885.

Patented Nov. 8, 1910.

4 SHEETS—SHEET 1.

Fig. 1.



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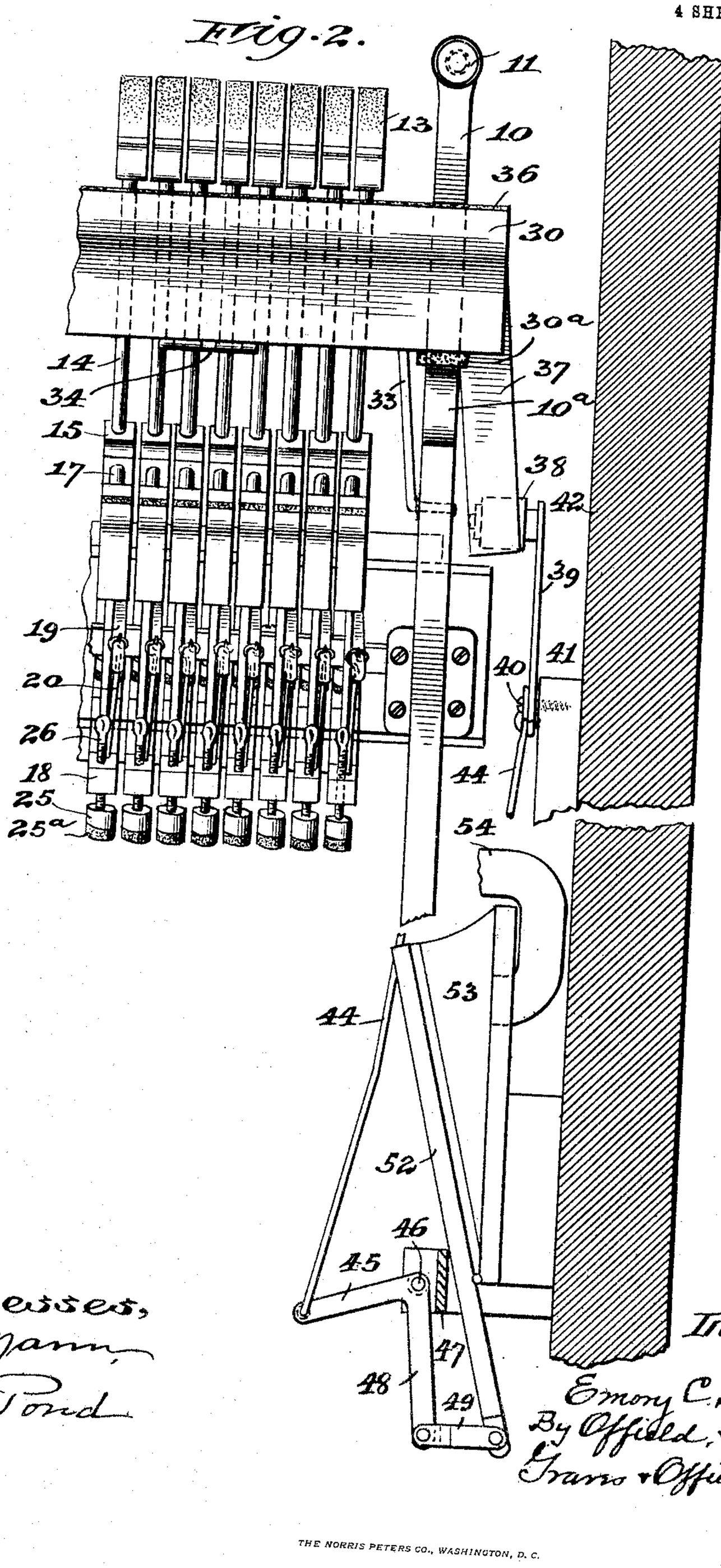
4 SHEETS—SHEET 2.

Fig. 2.



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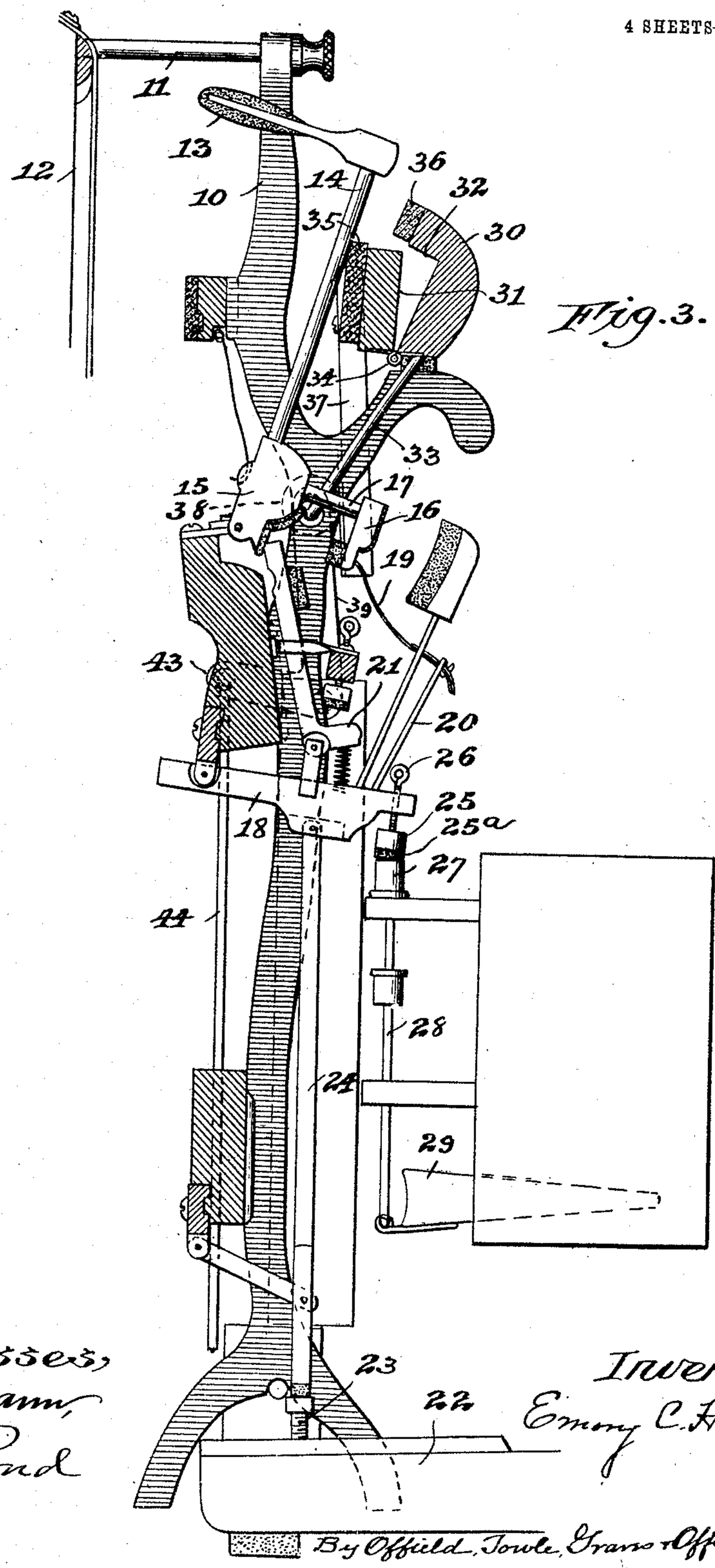

Fig. 3.

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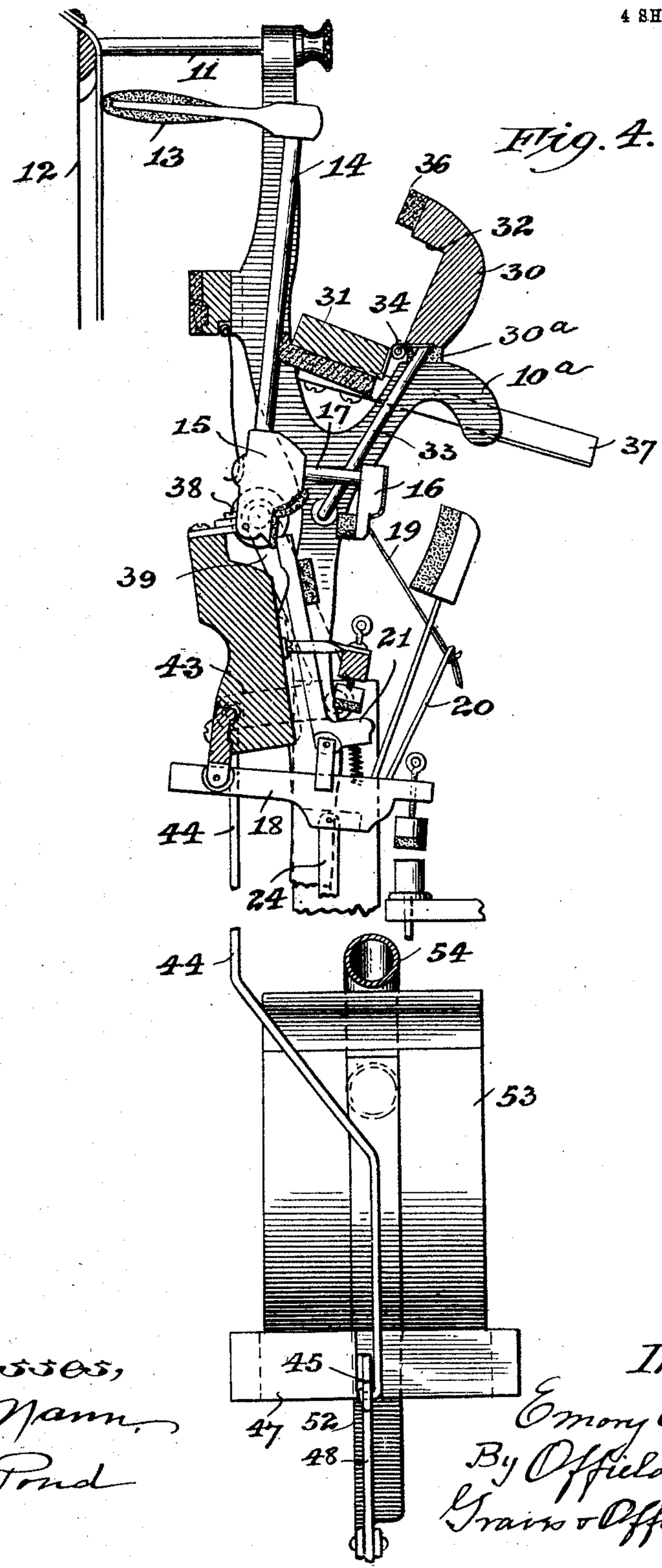
4 SHEETS—SHEET 4.

Fig. 4.



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UNITED STATES PATENT OFFICE.

EMORY C. HISCOCK, OF CHICAGO, ILLINOIS, ASSIGNOR TO W. W. KIMBALL COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

PLAYER-PIANO.

974,885. Specification of Letters Patent. **Patented Nov. 8, 1910.**

Application filed November 24, 1909. Serial No. 529,716.

To all whom it may concern:

Be it known that I, EMORY C. HISCOCK, 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 Player-Pianos, of which the following is a specification.

This invention relates to improvements in mechanical piano players, having reference more particularly to that type of player wherein the pneumatically operated playing mechanism is located wholly within the case of the piano itself, such pianos being commonly known as player pianos.

More specifically, my present improvements relate chiefly to a novel means for producing a soft-pedal effect when the instrument is played mechanically; such means in part having a further function as affording a convenient manually operable means whereby the wippens of the piano action may be raised temporarily above the lifters of the pneumatic action so as to avoid interference with the pneumatic action while positioning the latter.

In my Letters Patent No. 913,137, granted February 23, 1909, I have disclosed and broadly claimed a means for preventing interference between the piano action and the pneumatic action while positioning the latter involving as its operative principle the temporary lifting of the wippens of the piano action.

To the extent that my present invention relates to this feature, it involves the same broad principle of operation, namely, temporary lifting of the wippens of the piano action out of contact and interference with the lifters of the pneumatic action, but employs for this purpose certain manually operable elements that in themselves constitute also parts of my improved mechanism for producing the soft-pedal effect in the pneumatic action, thus in effect securing two distinct functions or results through or by a single mechanism and thus contributing to simplicity of structure.

My present improvements are based upon the use of a longitudinally divided or split hammer-rail, the inner and outer portions of which are hinged relatively to each other so that both sections are simultaneously actuated together by the usual soft pedal of the piano action, and the inner section alone is actuated by the soft-pedal pneumatic of the player mechanism. Hammer-rails of this type and operating in this manner have heretofore been known; and my present improvements have to do with a novel power-transmitting mechanism between the soft-pedal pneumatic and the inner section of the hammer-rail and with means whereby the latter may be used as a lever to effect the raising of the wippens through the hammer-shanks, butts, catcher-shanks, catchers, bridles, and bridle-wires.

The general object of the invention is to simplify and improve those parts of a player piano mechanism hereinabove more especially referred to; and the preferred means whereby this object is attained will be readily understood from the following detail description, taken in connection with the accompanying drawings, in which,—

Figure 1 is a side elevational view of parts of a standard form of piano action and its supporting frame above the keyboard, showing also in side elevation a portion of the pneumatic action for automatic playing, with my present improvements applied thereto, the hammer-rail actuating means from the soft-pedal pneumatic being partly omitted in this view for the sake of clearness. Fig. 2 is a front elevational view of the parts appearing in Fig. 1, with the pneumatic action omitted, and the soft-pedal pneumatic and its operating connections to the hammer-rail shown broken out intermediate its ends. Fig. 3 is a view similar to Fig. 1 but taken from the opposite side and showing the soft-pedal position of the hammers and their actuating parts as they appear when actuated by the soft-pedal mechanism of the mechanical or automatic player. Fig. 4 is a view similar to Fig. 3, but showing the extreme position of the hammers produced by the lever-like action of the inner section of the hammer-rail in effecting the raising of the wippens above and out of contact with the lifters of the pneumatic action.

Referring to the drawings, and first briefly naming the principal parts or elements of the regular piano action, with which my present improvements coöperate, 10 designates the action bracket or frame that is secured at its upper end by the bracket-bolt 11 with the plate indicated at 12.

13 designates the hammers, 14 the

hammer-shanks, 15 the butts, 16 the catchers mounted on the outer ends of the catcher-shanks 17, these latter being secured to the butts 15 at right angles to the hammer-stems 14, 18 the wippens connected to the catchers 16 by the usual bridles 19 and bridle-wires 20, and 21 the jacks.

22 designates the key, 23 the capstan screw, and 24 the abstract or sticker which transmits the movement of the key up to the wippen 18.

25 designates buttons carried by adjusting screws 26 mounted in the forward ends of the wippens 18 through which the wippens are actuated in automatic playing by the lifter members 27 mounted on the upper ends of lifter rods 28 that are in turn connected to and operated by the pneumatics 29 of the automatic or player mechanism; the buttons 25 being provided on their lower sides with felts 25^c that normally rest upon the lifter members 27.

Referring now to those features wherein my present improvements more particularly reside, 30 designates the main or outer section of a longitudinally divided hammer-rail; the inner section whereof, designated as 31, comprises, as shown, a strip of rectangular cross-section fitting a correspondingly shaped recess 32 in the rear face of the main section 30. Said main section is pivotally supported at its ends on the bracket 10 by the usual hammer-rail hooks 33 (Figs. 2, 3 and 4) so as to swing toward and from the strings and plate, resting normally through felts 30^a upon arms 10^a of the bracket 10; and the inner section 31 (which may be either a continuous strip or made in two sections corresponding to the base and treble registers of the keys and strings) is hinged at 34 at its lower edge to the proximate lower edge of the main section 30, so as to be capable of swinging inwardly and outwardly relatively to the latter on an axis between and approximately coincident with the contiguous inner edges of the two sections.

The inner faces of the section 31 and of the upper portion of the section 30 which normally lies flush therewith are provided with the usual felts 35 and 36, respectively, that form a rest or support for the hammer-shanks 14; and in manual playing the two sections of the rail are rocked forwardly unitedly or together by the usual lifter rod (not shown) leading from the soft pedal of the piano to throw the hammers nearer the strings and thus reduce the length and power of the hammer stroke. Rigidly secured to the inner hammer-rail section 31 at one end (or to the outer end of each section where independently operable base and treble sections are employed) is an inclined downwardly extending arm 37. Engaging the lower end of this arm is a roller 38 (Figs. 2 and 4) mounted on the upper arm 39 of a bell-crank lever, which latter is pivoted at 40 to a bracket 41 secured to the side wall 42 of the piano casing and has its other arm 43 connected by a long link rod 44 to one arm 45 of another bell-crank which is pivoted at 46 near the lower end of the side wall of the piano casing to a suitable supporting bracket 47, the other arm 48 of said last-named bell-crank being connected by a short link 49 with the lower end of an operating arm 50 that is secured to and longitudinally of the movable side of the soft-pedal pneumatic 53. The motor pneumatic 53 is actuated, as usual, by suction operating through a pipe indicated at 54, said pipe containing a valve (not shown) controlled by the usual manually actuated soft pedal lever (not shown) ordinarily located beneath the key-bed of the instrument.

In the normal operation of the mechanism to secure the soft-pedal effect when playing mechanically, the application of the suction or exhaust to the pneumatic 53 acts, through the described lever and link connections and the arm 37, to rock the inner section 31 of the hammer-rail to the position shown in Fig. 3, whereby the hammers are moved nearer the strings and the stroke thereof shortened; the interruption of the suction effect permitting the rail section 31 and its actuating parts to return to normal position (Fig. 1) by gravity. When the instrument is played manually, the soft-pedal effect is produced by swinging both sections 30 and 31 of the hammer-rail unitedly toward the strings and sounding board through the usual soft-pedal and its connections to the hammer-rail, the latter swinging on the hammer-rail hooks 33.

When the pneumatic action and the piano action are to be assembled, or when it is desired to remove the pneumatic action, the wippens of the piano action are raised to such a position as to avoid any interference with the lifters of the pneumatic action by manually swinging the arm 37 through substantially a right angle, to the position illustrated in Fig. 4, whereby the inner hammer-rail section 31 is caused to rock the hammers inwardly into contact with the strings or to such an extent as to produce a lifting effect upon the wippens through the described connections (butt 15, catcher-shank 17, catcher 16, bridle 19, and bridle-wire 20) between the hammer-shanks and the wippens. The relative positions assumed by the hammer-rail section 31 and the hammer shanks in such operation is such as to produce a self-locking effect which maintains the wippens in raised position until the hammer-rail section 31 is again restored to normal position by manual operation of the arm 37 in the reverse direction. It will thus be seen that the inner hammer-rail section

or sections 31 and the arm or arms 37 actuating the same have a double function. In the soft-pedal mechanism of the pneumatic action they serve to position the hammers to produce the soft-pedal effect; and for the purpose of assembling or separating the pneumatic and piano actions they constitute manually operable mechanism for effecting the raising of the wippens through parts of the regular piano action.

I am aware that heretofore it has been proposed to construct a hammer-rail in inner and outer sections capable of relative angular movement, both of which unitedly swing inwardly by the soft pedal of the piano action and the inner of which alone is swung inwardly by the soft-pedal mechanism of the pneumatic action; but so far as I am aware I am the first to hinge the inner or supplemental rail section directly to the main section or otherwise pivot it in such a way that it may serve as a self-locking agent to effect the lifting of the wippens through an extreme inward movement of the hammers. The actuating means for such inner or supplemental hammer-rail, including the arm 37 having the double function described, is also novel.

From the foregoing it will be seen that by utilizing part of a pneumatically operated mechanism for producing the soft-pedal effect, to produce a manually operable mechanism for raising the wippens for the purpose described, I dispense with the necessity of a separate and distinct means for lifting the wippens and to that extent simplify and cheapen the mechanism as a whole; and so far as I am aware my present invention presents the first instance of a single mechanism capable of performing these two functions.

Without, therefore, limiting the invention to the precise details shown and described, I claim:

1. In a player piano, the combination with the piano action and the pneumatic action, of mechanism for producing the soft-pedal effect through the pneumatic action, said mechanism including manually operable means for rocking the hammers of the piano action inwardly beyond their soft-pedal position whereby to effect the raising of the wippens of the piano action to such an extent as to avoid interference with the lifters of the pneumatic action in assembling and separating the piano and pneumatic actions, substantially as described.

2. In a player piano, the combination with the piano action and the pneumatic action, of mechanism for producing the soft-pedal effect through the pneumatic action, said mechanism including a pivoted hammer-rail section and an operating arm therefor through which the hammers of the piano action may be rocked inwardly beyond their soft-pedal position whereby to effect the raising of the wippens of the piano action to such an extent as to avoid interference with the lifters of the pneumatic action in assembling and separating the piano and pneumatic actions, substantially as described.

3. In a player piano, the combination with the piano action and the pneumatic action, of mechanism for producing the soft-pedal effect through the pneumatic action, said mechanism including a longitudinally divided hammer-rail the inner section whereof is hinged to the outer section, and a manually operable arm secured to said inner section through which the latter may be caused to engage and rock the hammers of the piano action inwardly into contact with the strings whereby to effect the raising of the wippens of the piano action to such a position as to avoid interference with the lifters of the pneumatic action in assembling and separating the piano and pneumatic actions, substantially as described.

4. In a player piano, the combination with the piano action and the pneumatic action, of mechanism for producing the soft-pedal effect through the pneumatic action, comprising a longitudinally divided hammer-rail the two sections whereof are hinged together at their lower edges, an operating arm rigid with the inner of said sections, a motor pneumatic, a bell-crank lever one arm whereof is disconnected from but adapted to engage and swing said operating arm, and lever and link connections between said motor pneumatic and the other arm of said bell-crank lever, substantially as described.

5. In a player piano, the combination with the piano action and the pneumatic action, of mechanism for producing the soft-pedal effect through the pneumatic action, comprising a longitudinally divided hammer-rail the two sections whereof are hinged together at their lower edges, an operating arm rigid with the inner of said sections, a bell-crank lever pivoted at its elbow, a roller mounted on one arm of said bell-crank lever and engaging said operating arm, a motor pneumatic, a bell-crank lever pivoted at its elbow adjacent to said motor pneumatic, operating connections between said motor pneumatic and one arm of said last-named bell-crank lever, and a link connecting the other arms of said bell-crank levers, substantially as described.

6. In a player piano, the combination with the piano action and the pneumatic action, of mechanism for facilitating the assembling and separation of the piano and pneumatic actions, comprising a longitudinally divided hammer-rail, the sections whereof are hinged together at their lower edges, and a manually operable arm connected to the inner of said hammer-rail sections through which the latter may be swung inwardly and caused to

rock the hammers of the piano action inwardly beyond their soft-pedal position, whereby to effect the raising of the wippens of the piano action to such an extent as to avoid interference with the lifters of the pneumatic action in assembling and separating the piano and pneumatic actions, substantially as described.

In testimony that I claim the foregoing as my invention, I have hereunto subscribed my name in the presence of two witnesses.

EMORY C. HISCOCK.

Witnesses:
SAMUEL N. POND,
FRANK L. BELKNAP.