

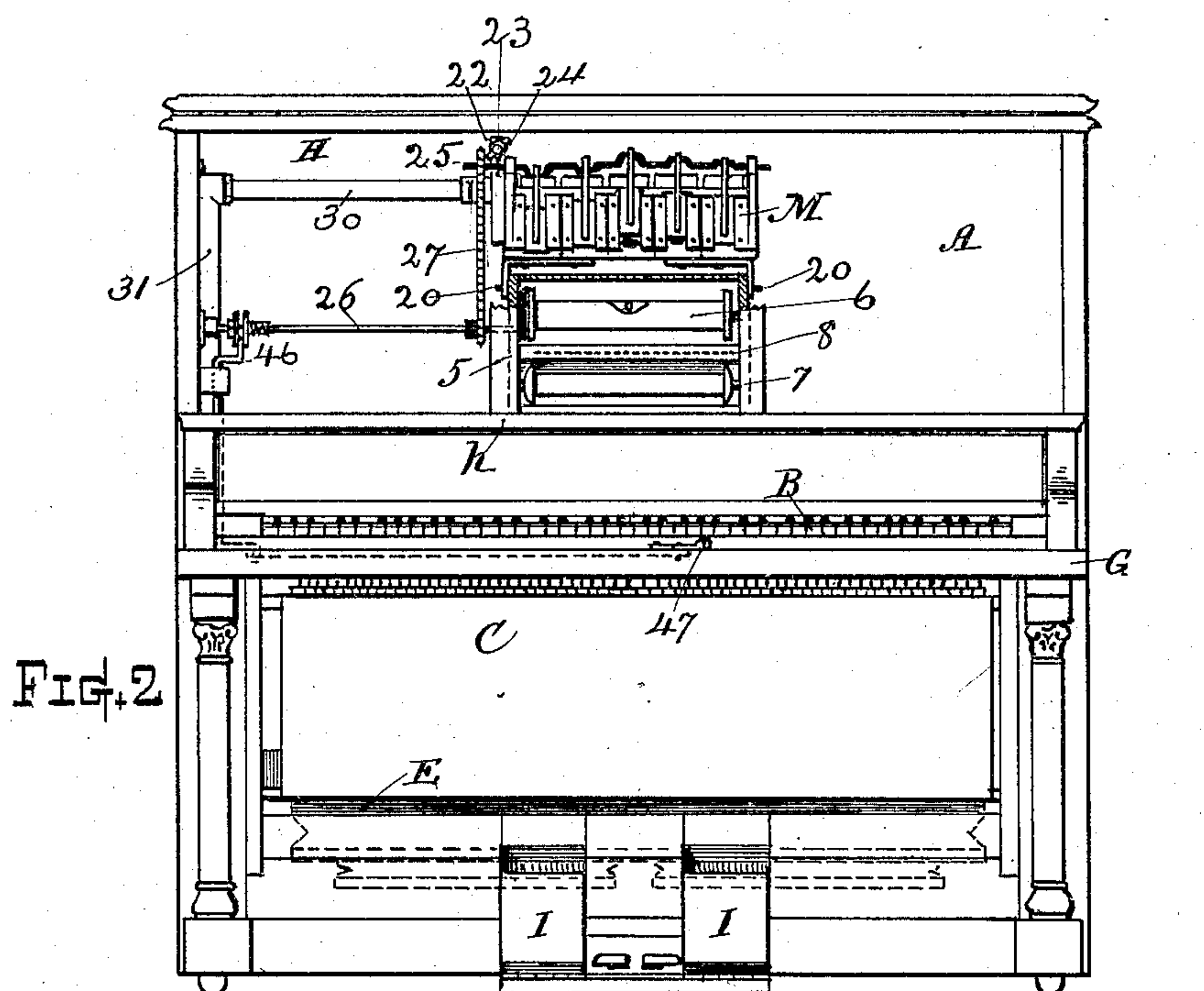
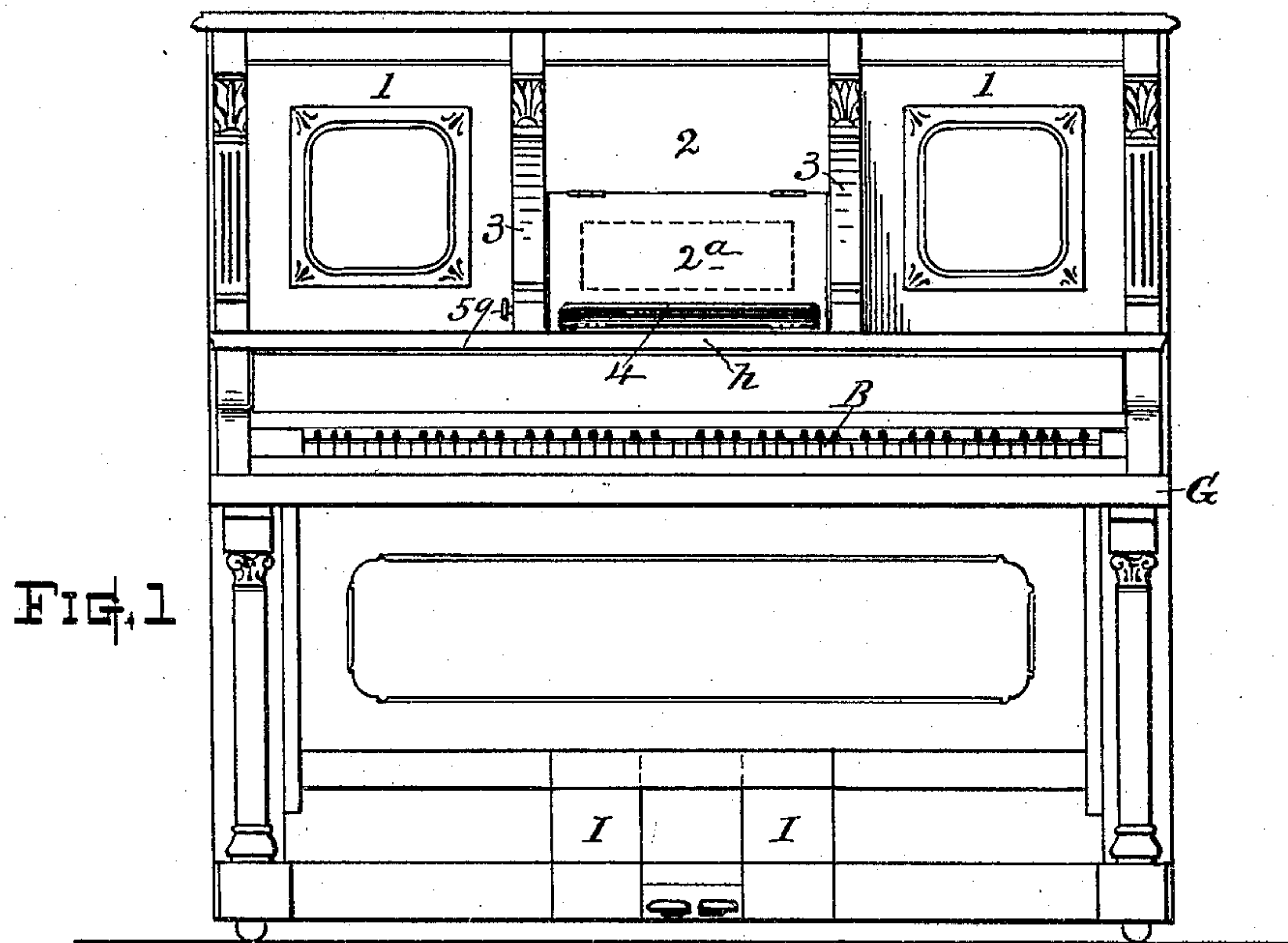
No. 793,662.

PATENTED JULY 4, 1905.

N. D. HOSLEY.  
COMBINATION AUTOMATIC PIANO.

APPLICATION FILED OCT. 31, 1904.

4 SHEETS—SHEET 1.



Witnesses.

W. V. Suck  
W. A. Hamington

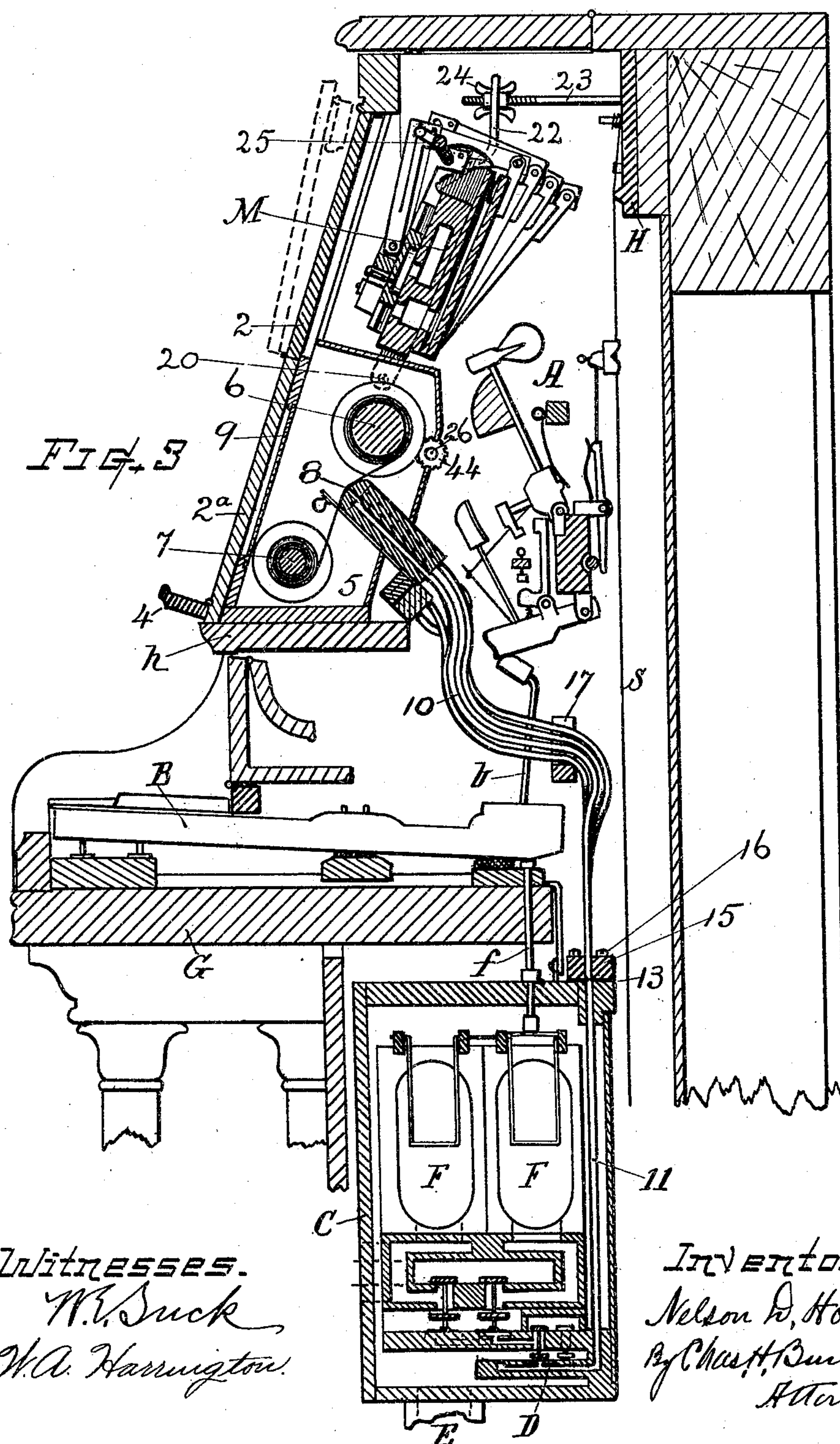
Inventor.

Nelson D. Hosley  
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4 SHEETS—SHEET 2.

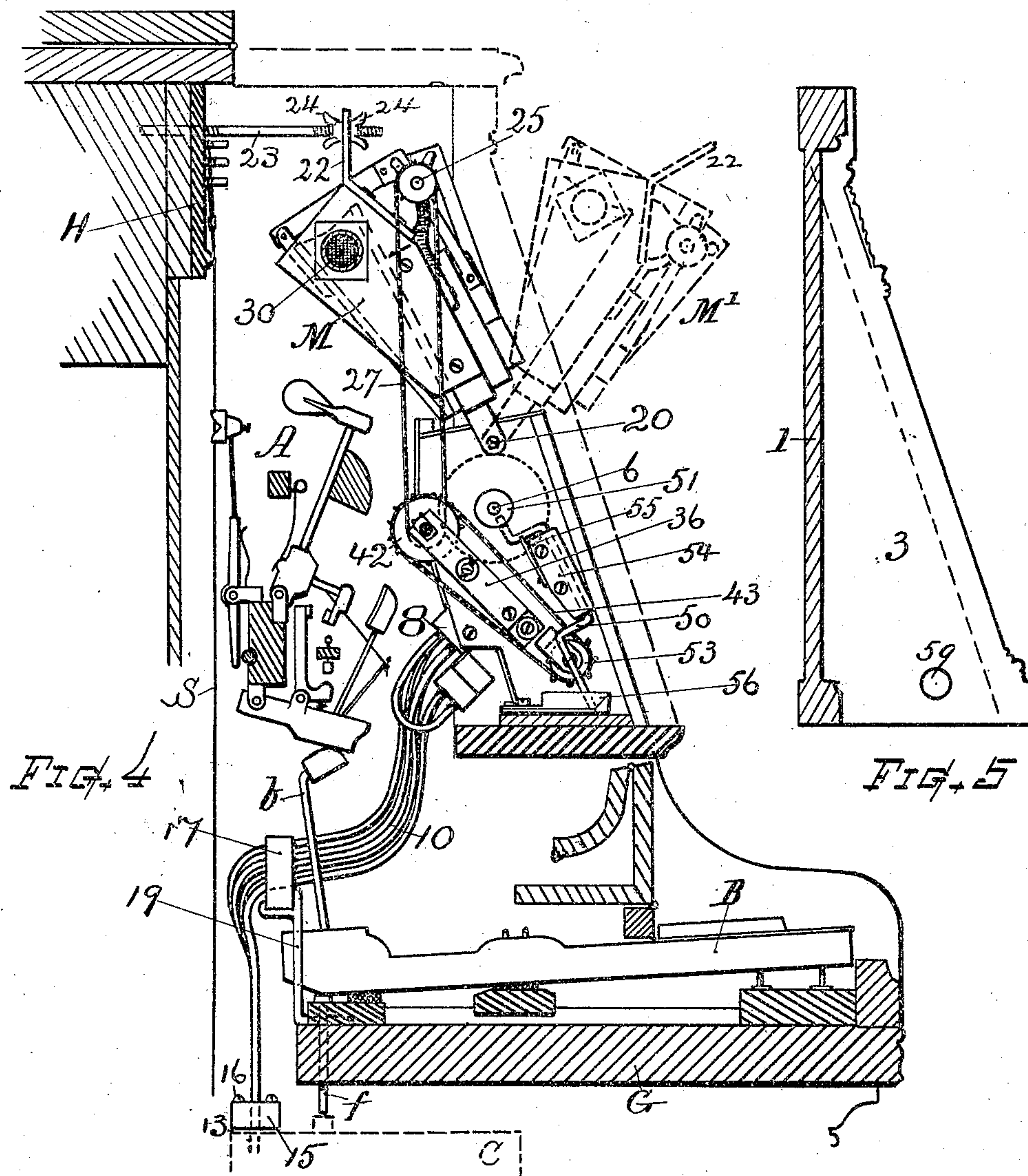




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COMBINATION AUTOMATIC PIANO.

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4 SHEETS—SHEET 3.



WITNESSES.

W. V. Suck  
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# UNITED STATES PATENT OFFICE.

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RATION OF CONNECTICUT.

## COMBINATION AUTOMATIC PIANO.

SPECIFICATION forming part of Letters Patent No. 793,662, dated July 4, 1905.

Application filed October 31, 1904. Serial No. 230,721.

*To all whom it may concern:*

Be it known that I, NELSON DAGGETT HOSLEY, a citizen of the United States, residing at Meriden, in the county of New Haven and State of Connecticut, have invented new and useful Improvements in Combination Automatic Pianos, of which the following, together with the accompanying drawings, is a specification sufficiently full, clear, and exact to enable persons skilled in the art to which this invention appertains to make and use the same.

My present invention relates to certain improvements in the construction and arrangement of the automatic action mechanism in combination with the body and manually-operated action in an upright piano, the objects thereof being to render such mechanism more compact, efficient, and desirable for use and to simplify and facilitate the manufacture and assemblage of the mechanisms in an instrument of this class.

The nature, structural organization, and novel features of my invention are hereinafter fully set forth, the particular subject-matter claimed being hereinafter definitely stated.

Mechanism embodying my claimed invention is illustrated in the accompanying four sheets of drawings, wherein—

Figure 1 represents a front view of a piano as adapted for containing my improved automatic mechanism. Fig. 2 represents a front elevation view with the front board of the casing removed, showing the arrangement of the motor and music-winding mechanism. To avoid multiplicity of lines, the piano-action mechanism is not shown on this figure. Fig. 3 represents a transverse vertical section at a central position of the instrument, showing the relation of the action parts of an automatic piano embodying my invention. The music-desk is shown in closed position in full lines and opened in dotted lines. Fig. 4 represents a transverse vertical section beyond the left-hand end of the spool-frame and with the front board of the casing removed. Fig. 5 is the section of

the removable front board, showing its outwardly-inclined bracket. Fig. 6 represents a front view of my detachable system of tracker-duct pipes, the tracker, pipe-connecting bar, and pipe-supporting guard, illustrating their relation in combination with the piano-action and keys; and Fig. 7 is a plan view of the pipe-attaching bar or member.

Referring to the drawings, A denotes the piano-action, the term "piano-action" as used in this specification comprising the group of mechanism including the hammers and hammer-actuating means and devices such as heretofore employed for sounding the strings and which being well known need not be separately described in detail herein.

B indicates the manual playing-keys by which the piano-action is operated.

C indicates the pneumatic system or wind-chest containing the controlling-pneumatics D and operating or power pneumatics F for effecting automatic playing. Said pneumatic-chest is disposed in front of the strings S beneath the key-table G, and the movement of the pneumatics F is transmitted to the playing-keys B by suitable means, preferably by vertical pitmen *f* beneath the rear ends thereof, as heretofore practiced and illustrated in Letters Patent No. 470,323. Suitable bellows or wind-inducing means at E is provided to be operated by the pedals I for exhausting air from the wind-chest or creating a r-p essure for working the various pneumatics, as will be understood by persons conversant with the art.

According to my invention the removable upper front board of the piano-case is provided with a central outwardly-projecting music-desk 2, flanked at either side by brackets or check-pieces 3. A part or section 2<sup>a</sup> of this music-desk is movable or hinged for the convenient opening of the front and is provided with a hinged music-rest 4. Within this outwardly-projecting portion I arrange the spool-housing frame or inner casing 5, having mounted therein the music winding take-up roll 6, the spool-supporting bearings



7, and the pneumatic-tracker 8, as shown. This housing and music-winding mechanism is accommodated by the space between the projecting brackets 3 directly in rear of the music-desk 2 and supported on the cross-piece or outstanding ledge *h* of the piano-casing. A sliding glazed door 9 is preferably provided for the front of the spool-housing space, which door can be raised for affording access for inserting and removing the rolls of music.

To provide a tracker and music-winding mechanism disposed centrally above the manual keyboard in connection with a pneumatic-action mechanism disposed beneath the key-bed and to render the mechanism practicable for manufacture and use, I have devised a detachable system of tracker-duct pipings and combined the same with the manual action substantially as illustrated. The air ducts or pipes 11 within the pneumatic-chest C all terminate at the top of said chest or at a proper seat-line, as at 13. The air-duct pipes 10, attached to and extending from the tracker 8, are bent rearward and arranged in groups to pass from front to rear between the action-lifters *b*, that stand upon the rear ends of the keys B and are then bent downward, spread laterally, and have their ends terminating and secured in an attaching bar or member 15 in an order which counter-matches with and fits the pipes in the seat-face 13 at the top of the wind-chest or near the back of the key-bed. Said bar 15 is detachably secured by screws 16 or suitable fasteners to the wind-chest, thereby connecting the two series of pipe-sections 10 and 11 in their respective order. The face of the attaching bar or seat is best provided with suitable packing to prevent leakage of air at the joint. Adjacent to the action-lifters *b* there is preferably provided a stationary guard-rail or supporter 17, having slots 18, within which the groups of pipes are confined and supported in a manner to prevent their displacement or the interference thereof with the movement of the lifters *b*. Said guard-rail is supported by standards 19, rigidly fixed to the bed G, key-frame, or other stationary part of the instrument.

By the construction shown and described the tracker 8, tracker-pipes 10, and attaching-bar 15 form a unitary or rigidly-combined structure that is separably independent of the underlying wind-chest, and it can be readily detached and reassembled in respect to the piano mechanism without difficulty and without special care as to the individual placement of separate pipes, it being only necessary to lift off the manual keys from their fulcrum-pins and then remove the fastenings or screws 16, when the upper system of pipes, together with the tracker and attaching-bar, can be handled as one piece

and the pneumatic system and wind-chest as another structural portion. This is of considerable importance in the manufacture and application of an automatic operating mechanism to an ordinary upright piano, since it overcomes various constructional objections heretofore found to exist and enables the wind-chest to be put in from below and the tracker mechanism from above the manual key-bed and both in front of the piano frame and action and without material change in the form or size of the ordinary piano-casing otherwise than the forward extension of the central part of the front board in the music-desk 2, the side portions of the front board I being disposed, as usual, in a vertical plane.

M indicates the pneumatic-power motor, which is disposed above the housing or spool-frame 5 within the space between the music-desk and the piano-action A. It is preferably supported on pivots or hinges at 20 to swing or rock bodily forward or backward at its upper part. Means is provided for securing and adjusting the motor-body at desired positions. Said means in the present instance consists of a slotted arm 22, rigidly attached to the motor-body and having its slotted portion engaged between adjusting-nuts 24, arranged on a screw-threaded rod 23, fixed in and projecting from the front of the piano-frame H. By removing the outer nut the motor can be tilted forward, as indicated by dotted lines at M', Fig. 4, for affording access to the string-pins and piano-action when tuning or adjustment of the piano is required. By the swinging adjustment of the motor bodily forward or rearward upon its supporting-pivots the tension of the drive chain or band 27, that connects the motor-shaft 25 with the roll-operating shaft 26, can be easily regulated.

A detachably-connected air pipe or conductor 30 (see Fig. 2) is provided, uniting the motor with an air-trunk 31 adjacent to the end of the piano-case and communicating with the wind-inducing apparatus and through which air is exhausted for causing the motor to operate. The conductor 30 is preferably flexible and is disposed in the space between the front board 1 and piano-action and is best arranged to be readily disconnected from the motor when the front board is removed for giving free access to the piano-action, if desired.

The operating-shaft 26 is supported in a suitable bearing member 36 and is provided with a pinion 44, that meshes with the gear of the take-up roll 6. The sprocket or wheel 42, that carries the rewind-chain 43, is mounted loose on the operating-shaft and provided with suitable clutch devices for its operative connection and disconnection therewith. The take-up and rewind mechanism is thrown into and out of action by an endwise move-



ment of the shaft effected by the rocker-crank 46, controlled by the reroll-stop 47 and suitable connections.

What I claim as of my invention, and desire to secure by Letters Patent, is—

1. In a combination automatic piano, comprising the piano-action, and a music-winding mechanism, a tracker and a pneumatic-power motor disposed in front of the piano-action and above the manual keyboard; a front casing provided with a central forwardly-projecting music-desk affording space for and inclosing said music-winding mechanism, tracker, and motor, and having a movable section for giving access to the music-winding rolls.

2. In a combination automatic piano comprising a manually-operated piano-action, the roll-housing disposed upon the cross-piece above the keyboard, and containing the music-winding rolls and tracker; in combination with the front casing provided with a central forwardly-projecting music-desk inclosing said roll-housing, and having an openable section, a folding music-rest on said section, and an inner slidable glazed door in front of the tracker and roll-housing space.

3. In a combination automatic piano, the piano-action, the manual keyboard, a wind-chest containing a system of primary and power pneumatics disposed below the keyboard, and a tracker and music-winding mechanism disposed above the keyboard; the tracker-duct pipes each composed of an upper and lower pipe-section, and having the lower section comprised within and terminating at the top of the wind-chest, the upper pipe-sections extending therefrom complete to the tracker and being bent to pass continuous between the piano-action members and having their upper ends attached to the tracker, and their lower ends fixed in a connection-bar that is detachably secured to the top of the wind-chest, with the adjacent ends of the upper and lower pipe-sections in countermatching order, substantially as set forth.

4. In a combination automatic piano, in combination, with the manual keys, the piano-action, and action-lifters; a wind-chest, and a series of pneumatic mechanisms for operating said keys, disposed beneath the manual keyboard, and a roll-housing, music-winding rolls, and tracker, disposed above the manual keyboard; the series of air-duct pipes leading from the tracker, arranged to pass between said lifters, a perforated attaching member having the ends of said pipes secured therein, means for detachably securing said member to the pneumatic-chest, and the countermatching series of air ducts or pipes leading to the controlling-pneumatics within the wind-chest.

5. In a combination automatic piano, the combination, with the piano-action, the manual keyboard, a wind-chest inclosing a system of controlling and power pneumatics, with means for operating the keys, disposed below the keyboard, a tracker and music-winding mechanism disposed between the piano-action and music-desk; the series of tracker-duct pipes bent rearward and arranged in a series of groups each of which comprises a number of pipes disposed one above the other where they pass between the action members, the rear portion of said pipes extending laterally and downward to range in regular series alinement, and a bar securing the ends of said pipes together and attaching the same, at the back of the key-bed, to a seat on the top of the wind-chest, and the countermatching ducts or pipes therein leading to the controlling pneumatics.

6. In an automatic piano mechanism, the combination, with the manual keys, action-lifters actuated thereby, a tracker located above the key-bed, key-operating pneumatics and controlling-pneumatics located below said key-bed, and tracker-duct pipes passing between the action-lifters; of a guard-rail having means for supporting or confining said pipes laterally at a position near said action-lifters, for the purpose set forth.

7. In a combination automatic piano, the combination, with the manual keyboard, the piano-action mechanism, and pneumatic key-operating mechanism beneath the manual keyboard; of the front casing having a forwardly-inclined music-desk provided with a movable section, music-sheet-winding mechanism and a tracker arranged within said desk and accessible by opening said movable section, a power-motor supported at the back of the music-desk above said music-winding mechanism, means for transmitting motion from the motor to the winding mechanism, and an air-conduit for said motor extending between the front casing and piano-string frame to an air-trunk at the end of the piano-case.

8. An automatic piano mechanism, comprising with the piano-action, a front casing provided with a forwardly-projecting music-desk; a roll-supporting frame or housing and music-winding rolls disposed within said housing, and an operating-motor disposed between the piano-action and front casing, said motor pivotally attached to its support to swing bodily forward for affording access to the piano-action, and means for retaining said motor bodily at normal position of adjustment.

9. In an automatic piano, in combination with the piano-action, and music-winding means; a pneumatic-power motor, a support therefor whereon said motor is hinged or bodily rockable, and means for adjusting



and retaining the motor at a position within the limits of its rockable movement.

10. A combination automatic piano having a piano-action, a manual keyboard, and  
 5 a removable front casing with a forwardly-projecting music-desk, the roll-housing disposed between the music-desk and piano-action above the keyboard, a power-motor supported on said housing by pivotal joints  
 10 whereon said motor can swing bodily, the tracker, music-spool bearings, and take-up roll arranged in said housing, an operating-shaft therefor, a drive chain or band connecting the motor-shaft and operating-shaft,  
 15 said shafts and motor disposed for variation of the tension of said drive-chain by bodily swing adjustment of said power-motor, and means for adjustably retaining the motor-body at position.

20 11. In an automatic piano, in combination as described, with the piano-frame, and the pneumatic-power motor having pivotally-connected supports; of an upwardly-projecting slotted arm fixed to the motor-  
 25 body, a projecting threaded stud fixed in the piano-frame and engaging in the slot of said arm, and adjusting-nuts on said stud for retaining the arm at adjusted position.

30 12. In a combination automatic piano of the character described, the combination,

with a music-winding mechanism and tracker disposed in front of the piano-action above the manual keyboard, and in rear of the music-desk, and a movably-supported pneumatic-power motor having means for operating the music-winding mechanism; of a flexible air-conductor detachably connected with said motor, and an air-trunk at the end of the piano-casing, communicating with the wind-inducing apparatus.

13. The combination, with the spool-housing frame arranged in front of the piano-action, the removable front casing, the tracker, take-up roll, and music-spool-clutch arbor mounted in said housing-frame, a two-  
 45 cranked rod or rocker device fulcrumed on said frame, its ends respectively engaging the take-up roll-shaft and spool-clutch arbor, an adjusting-screw in the cheek or bracket of the removable front casing, and  
 50 unconnected devices between said adjusting-screw and rocker for transmitting the regulating effect from said screw to said rocker device, for the purpose set forth.

Witness my hand this 27th day of October, 1904.

NELSON DAGGETT HOSLEY.

Witnesses:

F. C. WHITE,  
 STANLEY B. WHITE.