DESCRIPTION OF STANDARD PNEUMATIC PLAYER ACTION

With SUGGESTIONS *for* REGULATING *and* REPAIRING

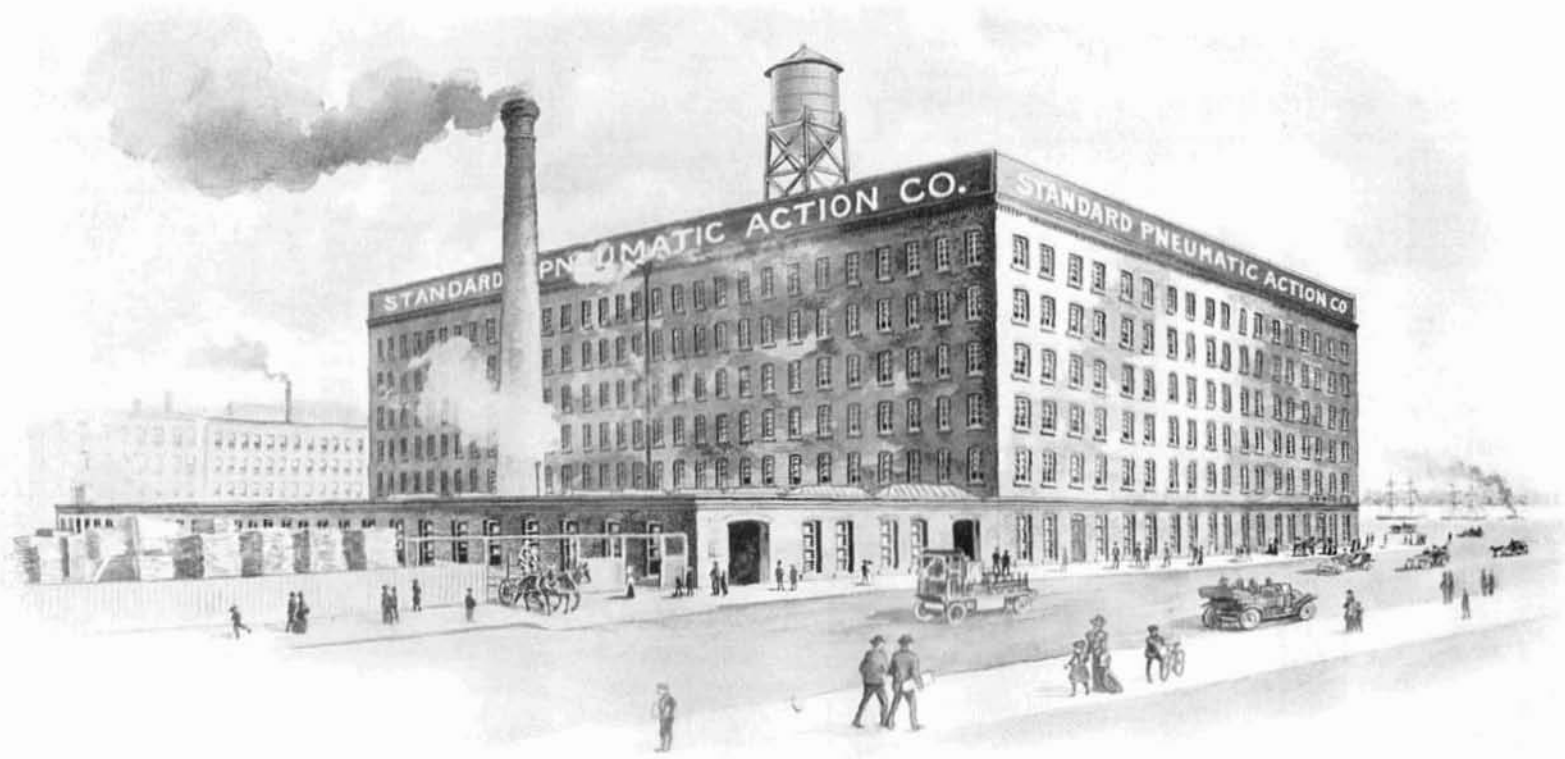
A Valuable Treatise For Manufacturers, Dealers, Tuners, Repairmen and Owners.

STANDARD PNEUMATIC ACTION CO.
638-652 WEST 52nd STREET
NEW YORK

STANDARD PNEUMATIC ACTION COMPANY

Manufacturers of Pneumatic Player Mechanism

Factory, 638-652 West 52nd Street
New York, U. S. A.



CAPACITY 25,000 PLAYER ACTIONS PER ANNUM

INTRODUCTORY

General Information about the STANDARD PLAYER ACTION

THE STANDARD PNEUMATIC PLAYER ACTION has been adopted by so many Manufacturers that nearly every dealer in the Country sells at least one make of Player Piano containing this Player Action. Manufacturers, Dealers, Salesmen, Tuners and Repair Men should therefore be thoroughly familiar with every part and detail of its construction, thereby making simple and easy the care, adjustment and repair of this well known Player mechanism.

Draughting and Experimental Dept.

Office of President and Treasurer

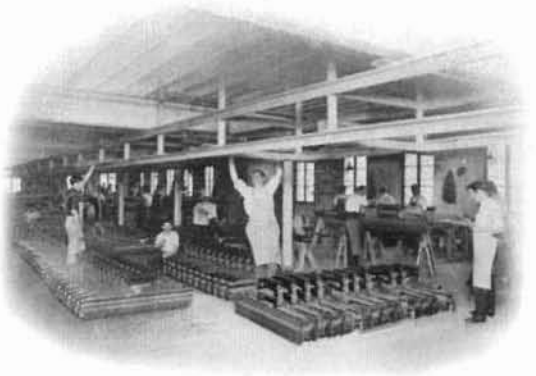
The builders of the STANDARD Player mechanism have reduced the possibilities of trouble to a minimum, so that this Player Action is practically trouble-proof, but with the hundreds of small parts necessary in the construction of a mechanism that can do what heretofore could be accomplished only by a skilled pianist after years of practise—that is, play correctly all the world's music—some care and attention is necessary to keep it in perfect order.

The instantaneous success of the STANDARD PLAYER ACTION is proof of its remarkable

Patented Dry Kilns

qualities, and there are many reasons for this success.

The excellence of the STANDARD PLAYER ACTION is due chiefly to its simplicity and durability. A careful study of this book will show how easy it is to lay your hands on any of the parts, and the matter of keeping a Player Piano in good condition when it contains the STANDARD PLAYER ACTION is only a question of a little intelligent application of the information contained herein.

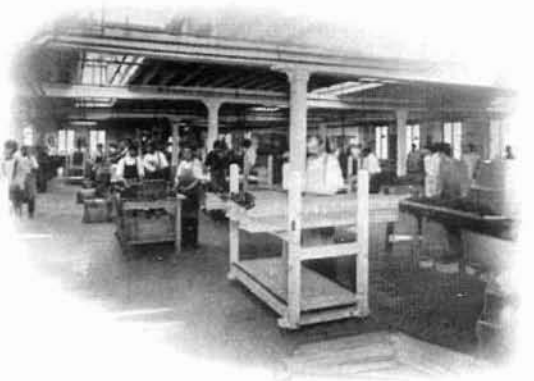


Top Action Finishing

The manufacturers of The STANDARD PLAYER ACTION have had experience in the Player Piano field for many years, and when the STANDARD went on the market it was not a ***new*** Player Action—it was the result of years of experimenting,—of principles in Player Action building that had been positively proven to be the most successful.

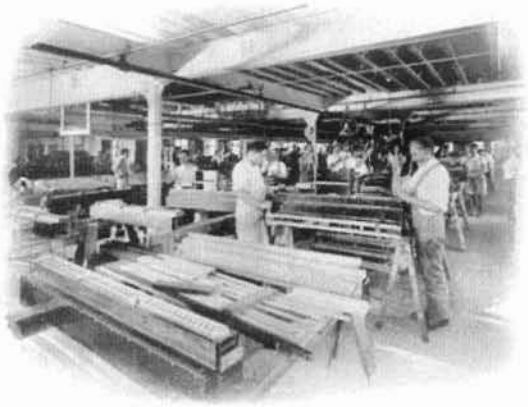
The manufacturers of the STANDARD PLAYER ACTION having perfected their product first, and possessing ample capital, commenced manufacturing on a large scale—working on the basis that a large factory with an enormous output makes it possible to reduce the manufacturing and selling costs, without affecting the quality. The Standard Player Action factory on West 52nd Street, near the Hudson River, is easily the Model Player Action Factory of the trade as may be seen by the photographs of the various departments reproduced throughout this introduction. There are no dark spots in this building during the entire day. A large court in the center brings

First Assembling



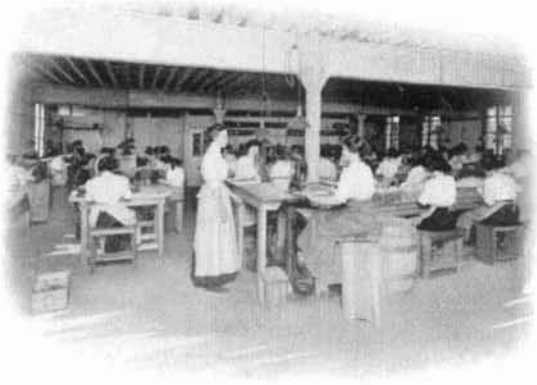
Second Assembling

light and sunshine to every corner making every inch of space available for manufacturing purposes. And into this completely equipped factory has been placed over $100,000 worth of especially designed machinery in addition to thousands of dollars worth of wood working and hardware machinery. These machines accomplish faster and more accurately the work usually done by hand, for men sometimes make mistakes,—a machine cannot.



Third Assembling

The object of the Standard Pneumatic Action Co. was not to place on the market a cheap Player Action but to bring out a first class Player Action at the right price—one made of material as fine as money can buy and containing every feature necessary to meet the demand for a durable and satisfactory Player Piano; a Player Action that is ***absolutely*** guaranteed for five years. That they have succeeded in accomplishing this is proven by their splendid success.



Small Work Assembling

The Standard Pneumatic Action Co. will make good any defect in material or workmanship in any part of its mechanism during that period. Thus the dealer who sells Player Pianos containing the STANDARD PLAYER ACTION is relieved of any responsibility and is fully protected and justified in recommending these Player Pianos to his patrons.

PRINCIPLE OF CONSTRUCTION

The Standard Action is manufactured under the principle of what

Leathers and Valving

Mill Department

is generally known as the "Double" System of Valves, carrying Primary and Secondary Pneumatics. This system, while considerably more expensive to build than the single, is without question more satisfactory, taking it from every standpoint.

The principal advantage in the use of the "Double" System is the infinitely better repetition when playing soft or Pianissimo passages. Experience has proven the only advantage derived from using the "Single" System is that it can be made cheaper, and our aim is to produce the most satisfactory possible product.

WARRANT

The Standard Player Action is guaranteed for five years. Any part or material which may prove defective during this period, if returned to the factory, will be replaced without charge.

PATENTS

THE STANDARD PLAYER ACTION IS FULLY PATENTED IN THIS AND FOREIGN COUNTRIES UNDER NEARLY FIFTY EXCLUSIVE PATENTS AND THE MANUFACTURER AND USER OF OUR PRODUCT MAY BE ASSURED OF THEIR INTERESTS BEING CAREFULLY PROTECTED BY PROMPT PROSECUTION OF INFRINGERS.

STANDARD PNEUMATIC ACTION COMPANY

638-652 West 52nd Street

New York City

GENERAL CONSTRUCTION

IN making our Player Action, our watchword is and always will be CARE: in fact the keynote of its wonderful success is the incessant and never ceasing care used in every detail of material and the labor performed thereon.

Material

METAL TUBING. All of our TRACKER BAR TUBING is made of flexible METAL and will last a life time. This Tubing is practically indestructible.

METAL PARTS. All of the hardware used is turned out in our own shops; particular attention being paid that only the best quality of metal is used and that each Part is absolutely uniform and true to size. All the exposed Parts are finely polished and heavily nickel plated, insuring very durable finish. The TRACKER BAR is of solid German Silver impervious to corrosion and will be forever free from tarnish and will not peel off as when cheaper material is used.

WOOD. Each piece of lumber is primarily given the most minute inspection, great care being taken that the grain is perfect and of uniform density, and only the heart of the finest quality woods of proven character *enters* into the construction. All this material is seasoned in our specially constructed dry kilns and is handled only by experts. Our *long* experience with Player Actions has proven that this is the only satisfactory method to follow.

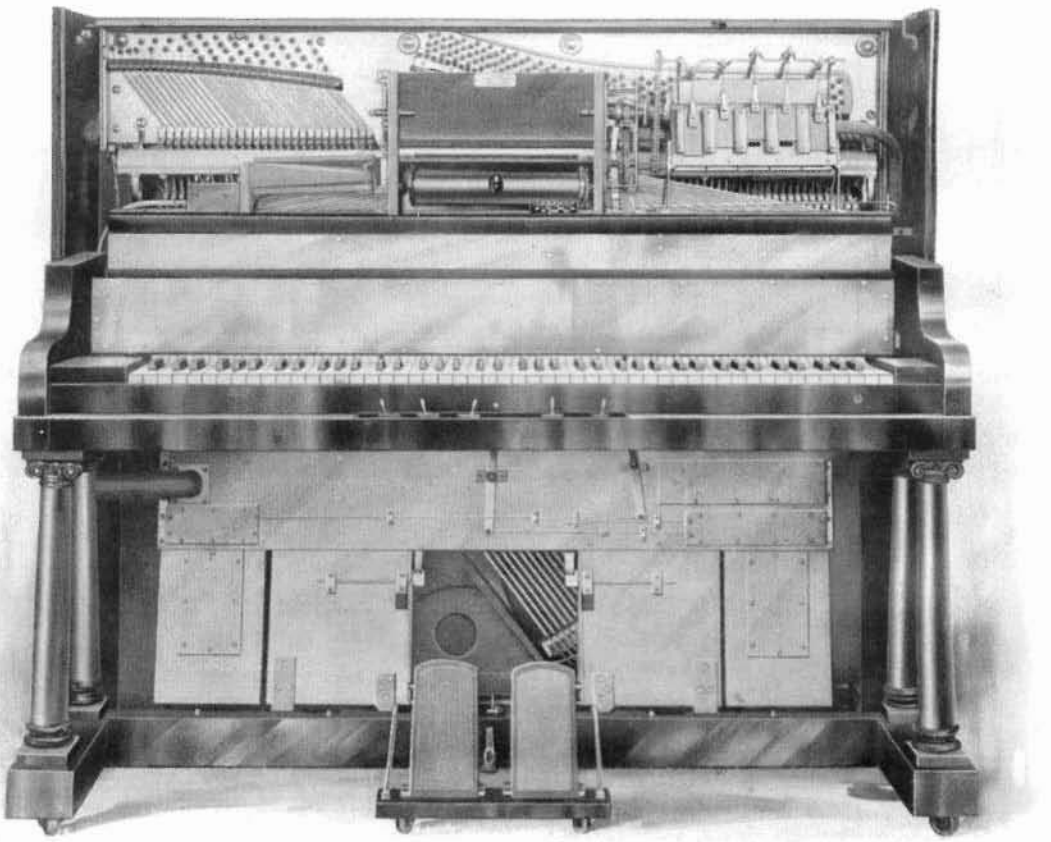
LEATHERS. In the selection of this, as in other material, we use only the finest quality; in fact, it may be said that, with all other materials as well as Leather, cost is of secondary consideration, as we know it to be poor economy to use anything but the very best and this particularly applies to Our Player Action—guaranteed as it is for five years.

CLOTHS. The coated Cloths used are especially woven.

They are especially treated for our use and are perhaps the finest and most expensive manufactured. It is only by the use of immense quantities that we are able to have produced Cloths of this special quality.

TUBING. The Tubing that connects the Bellows with the Pneumatics, the Motor and the Shifter is of the strongest and most durable quality of specially treated pneumatic hose. The hose is never coiled or hung in an exposed position; therefore it cannot become cracked from bending, or chafed. Experience has proven this material and method of installation to be correct and we stand by the quality, workmanship and mechanical efficiency.

Player Piano Mechanism Showing Front View of Top and Bottom Actions and Playing Levers



Cut 1

SPECIAL FEATURES

The many patented special Devices used exclusively in our Player Action have been brought to perfection only through exhaustive experiments and research with the aim of making these devices as simple as they are effective.

Among the exclusive devices used, we mention:

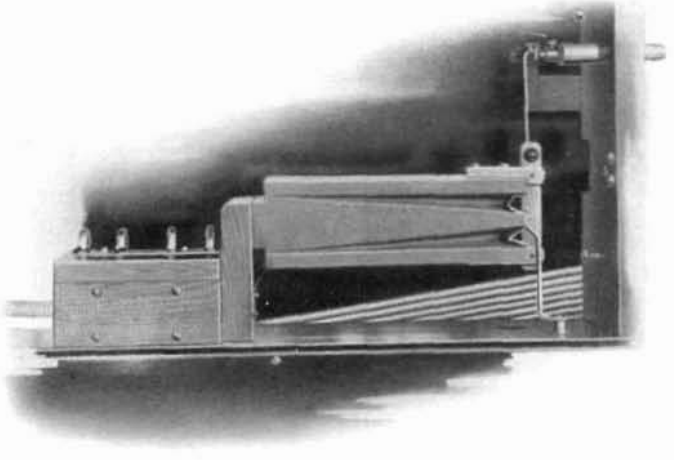
Flexible Striking Fingers.
Self Adjusting Pneumatic Tracking Device.
Instantaneous Self Acting Accenting Bellows.
Self Adjusting Sliding Treadle Door Opener.
Patented Folding Treadle Set.

In addition to the above, there are many special Patents covering various Pneumatics and Air-ways but as these are of technical nature they will not interest the general public sufficiently for us to dwell upon them here at length.

Music Roll Tracking Device or Shifter

(PATENTED)

One of the most important features in connection with any 88-note player piano action, and one which is more prone to give trouble than any other, is the proper alignment or tracking of the music roll over the Tracker Bar while playing. Paper music rolls are invariably subject to climatic changes and it is a well known fact that under certain conditions the variation amounts to over one-eighth of an inch. When this variation occurs it is impossible to make the music track uniformly over the perforations in the Tracker Bar and as a consequence the Notes will not play; in other words, the "Player will not play" without the use of a tracking device.



Cut 2

It is universally conceded by both player experts and public that our Self Adjusting Tracking Device is a perfect mechanism. The working of this Device is really marvelous and is emphasized more strongly through the many attempts that have been made to imitate this patented feature. It may be truthfully said that many so-called shifter devices appear to be almost crude when compared with ours. The very simplicity of our Tracking Device is what appeals to everyone.

How the Tracking Device Operates

Placed on each side of the Tracker Bar, at a point where the margins of the music roll paper move over the Tracker, are two holes which run to a valve operating a small Bellows connected with the Music Spool. When the music is tracking properly the paper covers these holes. The instant the music roll paper shifts or for any reason fails to cover these holes, air is taken in one of them causing the music spool to automatically and instantly readjust its position so as to be in perfect alignment. Thus at all times the operator can be assured of the "Selection" being played with absolute precision.

Another remarkable feature in connection with the efficiency of this Tracking Device is that it does not depend upon any arm or other mechanical Lug connected with or operating on the edge of the music paper; and therefore the Roll never becomes torn, ragged or frayed, as in the case where such contrivances are used. Consequently, Music used in our player will wear twice as long as when used in others.

Technical Description of Tracking Device or Music Roll Shifter

The accompanying sketch shows our Automatic Tracking Device in outline. In the Shifter Box proper the portion to the left of the shaded line is the front section as the Box is placed on the piano; the section to the right is the rear part.

The operation of the Shifter is almost identical with the valves of the Action and a careful study of the description of the latter covers all the points.

It should be borne in mind that the Valves in the Shifter operate by intake of air through the pairs of holes at each end of the Tracker Bar. Consequently, if the music does not track perfectly or if for any reason it is not of proper width through poor cutting or weather conditions it will cause the holes to be exposed and the air will intake through the valves in precisely the same manner as when a perforation in the paper tracks over one of the regular holes in the Tracker Bar.

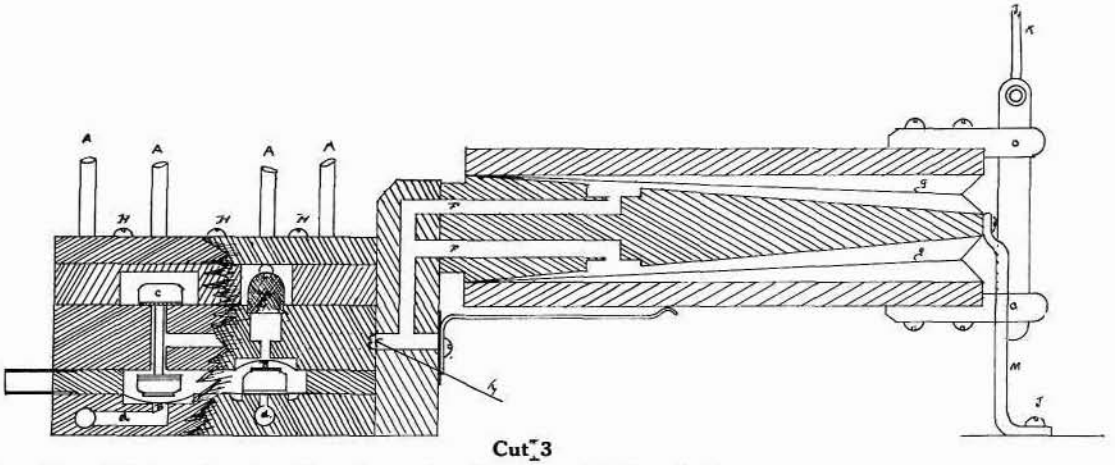
Care of the Tracking or Shifter Device

Our Tracking Device, unlike the majority of others which have to be constantly manipulated by a Thumb Screw, is automatic in its operation and in consequence needs practically no attention except that it should be cleaned out at intervals. In other words, small pieces of lint from the music paper and other foreign matter which accumulate on the screens; or dust arresters, should be removed.

To do this remove the three screws "H" which will release top block, after which will be exposed four wire cloth Dust Arresters "E" and any dust accumulation can be very easily brushed from these.

A lettered Plate screwed on top of the Block indicates at once the Block which is to be removed.

Cross Section of Shifter and Description.



Cut 3

"A" Metal Tubes leading from Tracker Bar.
"B" Pouch under Primary Button.
"C" Primary Button.
"D" Channel under Pouch.
"E" Gauze Sieve or Dust Arresters.
"F" Channel to Bellows.
"G" Bellows.
"H" Screws securing sieve cover.
"I" Governor Vent.
"J" Screw.
"K" Wire.
"L" Wire Support.

Flexible Striking Finger

(PATENTED)

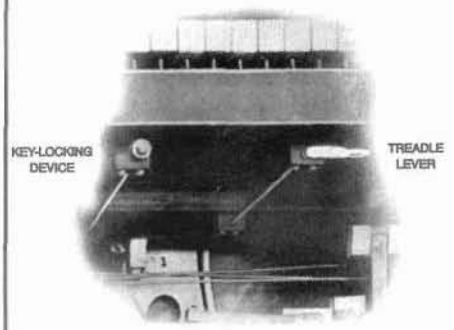
Among the many problems which have arisen from time to time with builders of Player Actions is the difficulty of overcoming the harsh mechanical blow usually obtained from a player mechanism. After exhaustive experiments, we have perfected and patented what is called a FLEXIBLE STRIKER, or FINGER, "L" on Cut 5. This consists of a slotted Arm connecting directly from the Player Action to the Piano Action. When the blow is struck by the player pneumatic, instead of being a positive pounding as in other players, the interception of the Slotted Finger causes the blow to be softened and by this means the notes are given the delicate human-finger touch so much sought. The best method of showing the splendid effect, where the Flexible Striking Finger is used, is by actual comparison with the ordinary type of players which are not equipped with this Device. Furthermore, the softening of the blow tends to preserve the entire piano thereby insuring long life to the instrument.

Self-Acting Accenting Bellows

(PATENTED)

The art of building a Player with which the operator can obtain the utmost efficiency of expression through the Treadles is the aim of every manufacturer. In most players it is difficult to obtain and can be produced only through severe and continued pumping. This tends to discourage and causes many operators to soon become tired of the steady monotony of tone. Our Accenting Device is so delicate that by merely a slight extra pressure upon either Treadle, the operator can accent any single note or series of notes instantaneously and with a minimum degree of pumping, can obtain those delicate soft passages so much desired.

Key-Locking Device



Cut 4

When the Piano is operated by the Player Action, it is customary for the operator to lock the Keys and for this purpose there is provided a very simple arrangement. It consists of a maple strip hinged between the Key Bottom and the piano keys proper. Connected to this strip is a rod extending underneath the Key Bottom, on the right-hand side coming forward to a convenient position so that the operator, by simply pulling or pushing out the knob (left hand one in cut) locks or unlocks the keys at will.

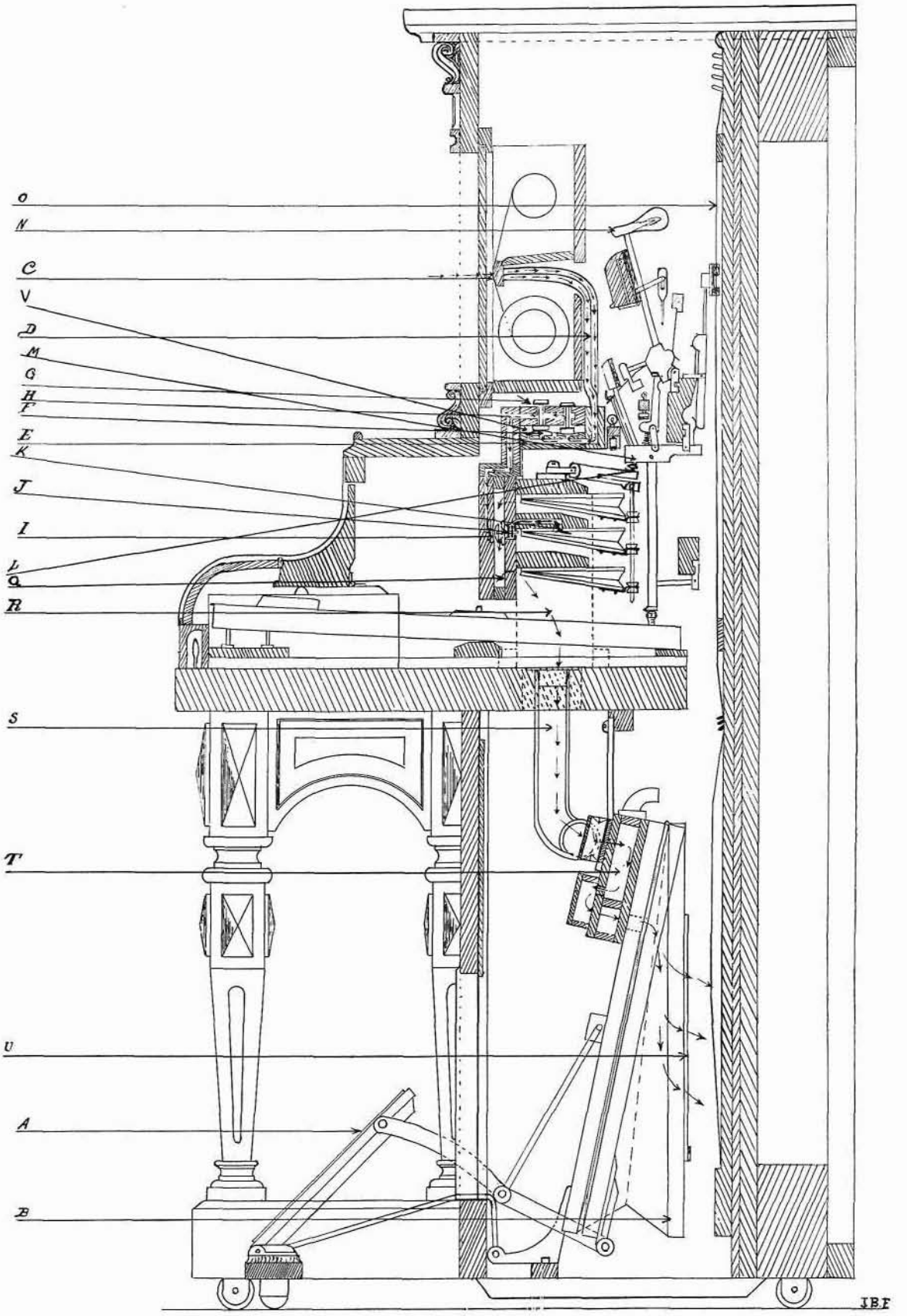
When locking the keys be sure to pull the knob all the way out as otherwise the strip will not press firmly against the keys and they will be only partially locked.

Side View of Mechanism

Showing the Air Currents through the Player Piano

The Red Arrows on Cut 5 indicate how the air is taken in. Pressure of the foot on the Treadles "A" causes the Feeders "B" to expand and thereby create a state of partial vacuum in the Bellows Chest "T" and Action Chest "Q". When a perforation in the paper registers with the corresponding hole in the tracker bar, air is taken in and carried down through the Metal Tubes "D" into the Primary Channels "E". It should be borne in mind that Valve Chambers "Q" and "V" are connected with the exhaust. Pressure of the air at "F" causes the Primary Pouches, or Diaphragms as they are sometimes called, to be expanded, thus forcing the Primary Valve Buttons "G" open or away from their upper seats and at the same time closing their lower or inside seats. This allows the air to be taken in again through the Primary outside inflation Channel "H" through which it is forced against the secondary Pouch "I" or Diaphragm. This Pouch is in turn expanded and likewise causes the Secondary valve "J" to be opened, which causes the air to be drawn from the Pneumatics "K". By the collapse of these Pneumatics the Flexible Striking Finger "L" which rests under the Piano Wippen "M" is raised and this in turn causes the piano Hammer "N" to strike against the Piano Strings "O".

When Secondary Valve "J" is operated, causing the striking Pneumatic "K" to close, the air is drawn through the Action Chest "Q" through the Wind Trunk "R", following down through the rubber tubing "S" into what is known as the Pump Channel "T" and from there into the Feeding Pumps or Feeders "B" and is exhausted out through the palate "U" on the out-side of the Pump.



Cut 5

Patented Folding Treadle Set

(PATENTED)

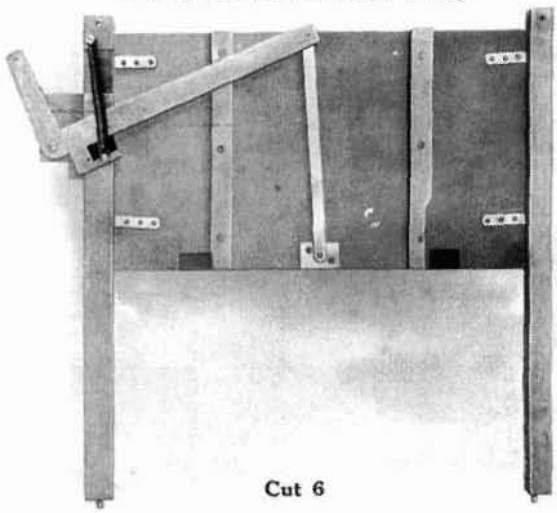
In the ordinary player piano, the Treadles are so constructed that they necessitate a very large opening in the Bottom Frame, making an unsightly and awkward-looking Piano Case. With our construction, the size of the Treadle Door is reduced to one-half that in the ordinary style and is a much neater and more uniform arrangement.

Self-Adjusting Sliding Treadle Door

(PATENTED)

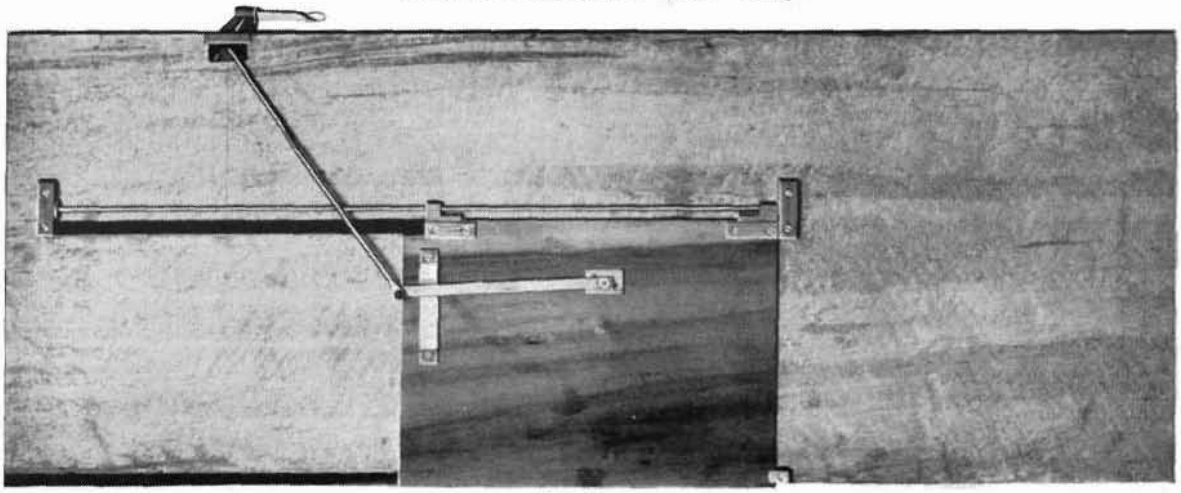
This is a very clever little Device to enable the operator to bring the Treadles into playing position without stooping over awkwardly, which must be done if the Panel has to be lifted by hand. In our arrangement the handle on the right in cut (4), directly under the right-hand side of the Keyboard connects with a Lever to the Panel and by simply turning this Handle to the right or left, the Sliding Panel can be raised or lowered and the entire Treadle Frame brought into playing position with the aid of the foot. Another pleasing feature in connection with this Self Adjusting Panel Opener is that it is so balanced that while playing it can be partly closed to effectually conceal all of the interior Parts of the Bottom Action. Cuts 6 and 7 show the rear view of the two styles of sliding panels.

VERTICAL STYLE (Rear View)



Cut 6

HORIZONTAL STYLE (Rear View)



Cut 7

TECHNICAL DESCRIPTION

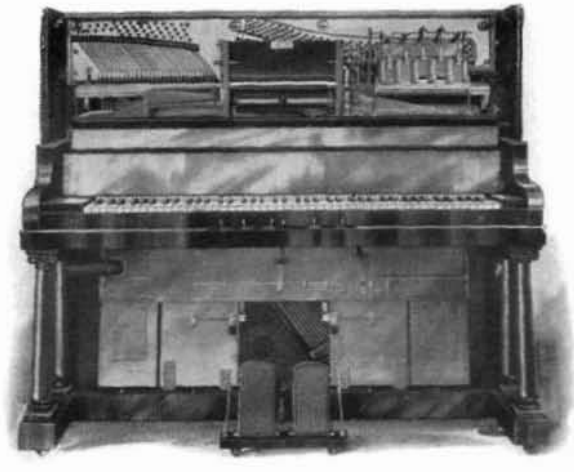
For Convenience

In order to localize the parts, we have divided the Player Action into two sections.

1. TOP ACTION
   - a Shifting Device.
   - b Motor.
   - c Tracker Bar.
   - d Spool Box.
   - e Tubing, connecting with Pneumatics.
   - f Primary Valves.
   - g Secondary Valves.
   - h Striking or Power Pneumatics.

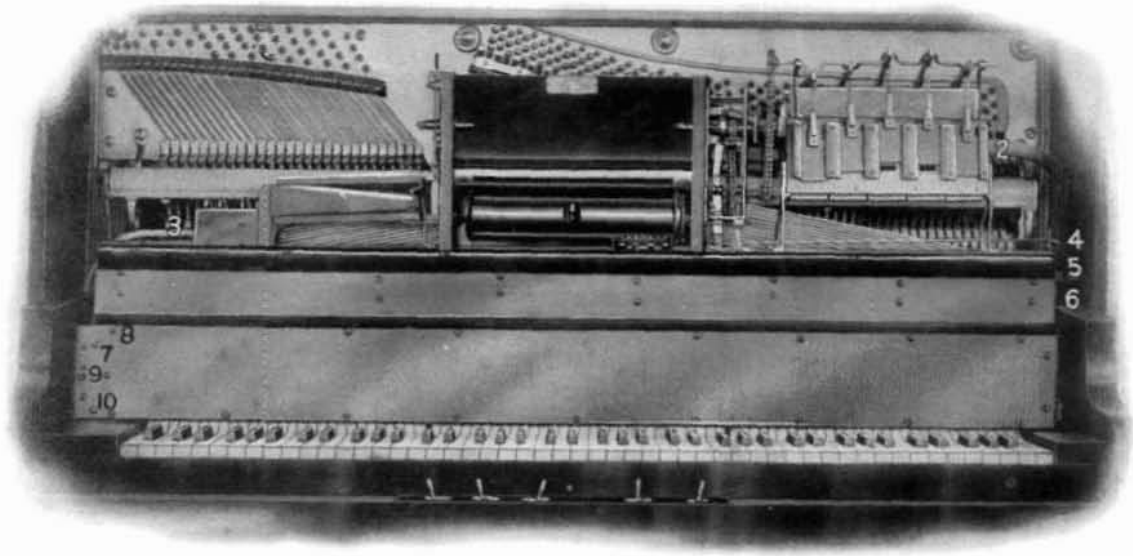
2. BOTTOM ACTION
   - a Key Lock Rail and Levers operating various devices.
   - b Governor.
   - c Tempo and Reroll Chamber.
   - d Treadles.
   - e Bellows.
   - f Tubing, connecting with Pneumatics.

Each section is treated separately on the following pages, in such a manner as to describe the function of the mechanism, its method of operation and the correct remedy for any possible trouble that may develop.



Cut 8

How to Remove the Top Action



Cut 9

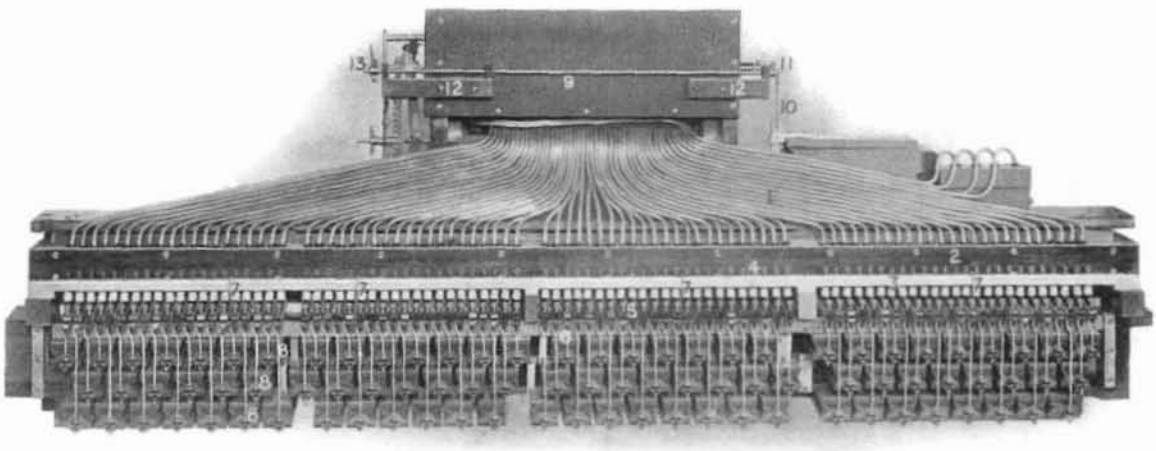
Take out the top frame (or panel) of the piano, also the fall board (or lid). Take out screw No. 1 (see cut 9) in the metal brace on the left-hand side of spool-box which is screwed to the iron piano plate. Disconnect rubber tube No. 2 from motor, also rubber tube No. 3 from the shifter pneumatic. Remove the leather nuts from the reroll wire No. 4 and disconnect Tempo Indicator connection No. 5. Unscrew large screw No. 6 at the right end of the action; also oval head screws Nos. 7, 8, 9, 10, at the bass end. Take hold of the action at both ends and draw it forward a few inches when you will be able to lift the action out of the piano. When replacing the action be sure and get the screws Nos. 6, 7, 8, 9, 10, fairly tight. Be careful in slipping on the rubber tubes Nos. 2 and 3 to see that they fit snugly into their respective parts. Don't meddle with the Tempo indicator pointer.

How to Regulate and Adjust the Valves

Should some of the Notes in the Player refuse to respond quickly and the Hammers of the piano not return immediately to the Hammer Rail, it is a pretty sure sign that there is dust under either the Primary or Secondary Valves. They do not seat properly or possibly the vents are clogged with dirt.

Counting from the bass end of your piano (see cut 9) locate the note or notes that are not playing freely. Then count from the bass end of the wooden Primary Buttons "G" on Cut No. 10 and see if the corresponding Valve is seating properly. If not take a fine wire, bending a right angle turn on it and working it gently under the top button will remove any particles of dirt that may have settled there and your instrument will again play perfectly. Should the trouble not be with the Primary Valves, examine the Valves on board No. 1 Cut No. 11 in the main action chest. The natural position when the instrument is being played shows the Valves resting against the metal cups. If the Valves rest or seat improperly on their metal cups, the action will leak, in which case the metal cup should be unscrewed, taken out, cleaned off, and replaced.

Rear View, Top Action



Cut 10

1. Metal Tubes.
2. Channel Board for Metal Tubes.
3. Regulating Rail.
4. Regulating Screws.
5. Flexible Strikers.
6. Pneu. Connection Wires.
7. Wire Support for Reg. Rail.
8. Striking Pneumatic.
9. Shaft for Tracking Cam.
10. Wire between Shifter Box and No. 11.
11. Hub on Collar on No. 9.
12. Supports for No. 9 Shaft.
13. Shifter Cam.

How to Regulate the Top Action

Cut 10 illustrates rear view of Top Action showing metal tubes, regulating buttons, and striking fingers. In making the adjustments in the piano the wippens or butts of the piano action should rest lightly on the capstan screws of the flexible strikers No. 5, and the regulating buttons No. 4 should be set so that they touch lightly. If too close the strikers will travel too far and over exert the piano action. It will be seen at a glance how easy this is to regulate. The pneumatic connection wires No. 6 are not to be regulated unless regulating the strikers has partially closed the pneumatic. Press down the piano key and pull up the flexible striker No. 5 until it is as high as the key will lift the piano action, then set the regulating screws No. 4 accordingly. If the leather nuts or pneumatic connection wires No. 6 are loose, tighten them but not too much, otherwise they will bear too hard on the hinge of the pneumatics.

How to Regulate Top Action (continued)

Information for Installing

It might be well to tighten up the screws in the Tube Rail or Channel Board No. 2. By taking off Regulating Rail No. 3 you will have a full view of the screws in Tube Rail No. 2. In fact it would be advisable to see that all screws are tight.

The Buttons No. 4 on the Regulating Rail are used as a stop or check on the pneumatics so that when closed the hammer will not block the strings. To regulate the striker use a tool with a hook on the end and by inserting the hook in between the strikers they can be pulled up against the Regulating Rail. The striker should give the piano action the same throw or lift as the pressing down of a key. Turn the regulating screw either to the right or left until the desired regulation is obtained.

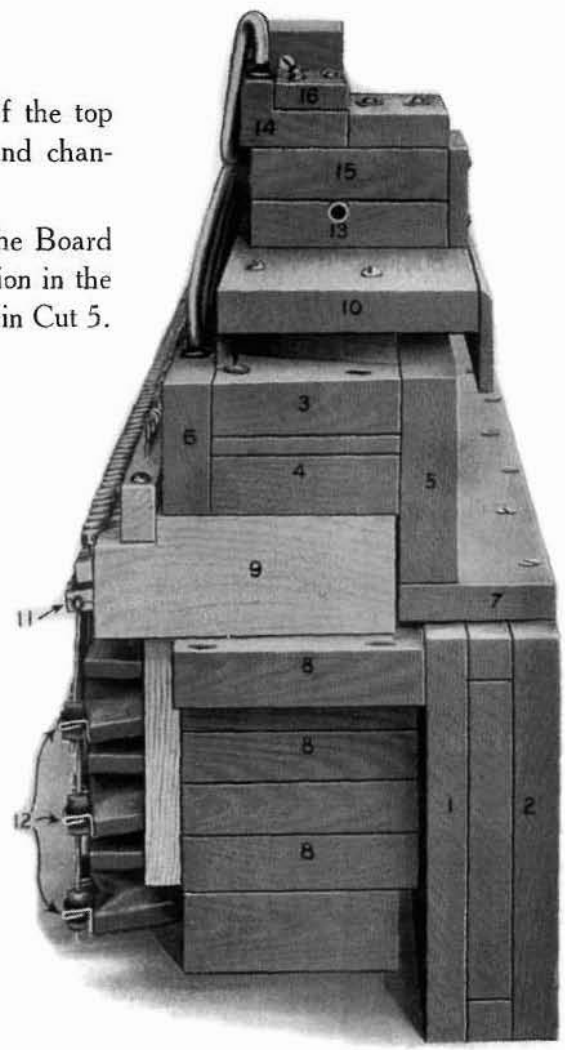
Top Action

Illustration No. 11 shows the end view of the top action and the relation of the valve, pouch, and channel boards of the top action to each other.

Identical parts bear the same number in the Board and End View Cuts 11 and 12, and their relation in the work of the entire action is shown by the arrows in Cut 5. (Diagram).

End View, Top Action

1. Secondary Valve Board.
2. Secondary Pouch Board.
3. Primary Valve Board.
4. Primary Pouch Board.
5. Channel Board connecting Primary and Secondary.
6. Metal Tubing Channel Board.
7. Channel Board connecting 2 and 5.
8. Pneumatic Shelves.
9. Channel Block for Primaries.
10. Shelf for Spool-Box.
11. Strikers.
12. Metal Hangers for Pneumatics.
13. Nipple for Exhaust Hose.
14. Metal Tube Block for Shifting Device.
15. Valve Box for Shifting Device.
16. Cover for Dust Arresters.



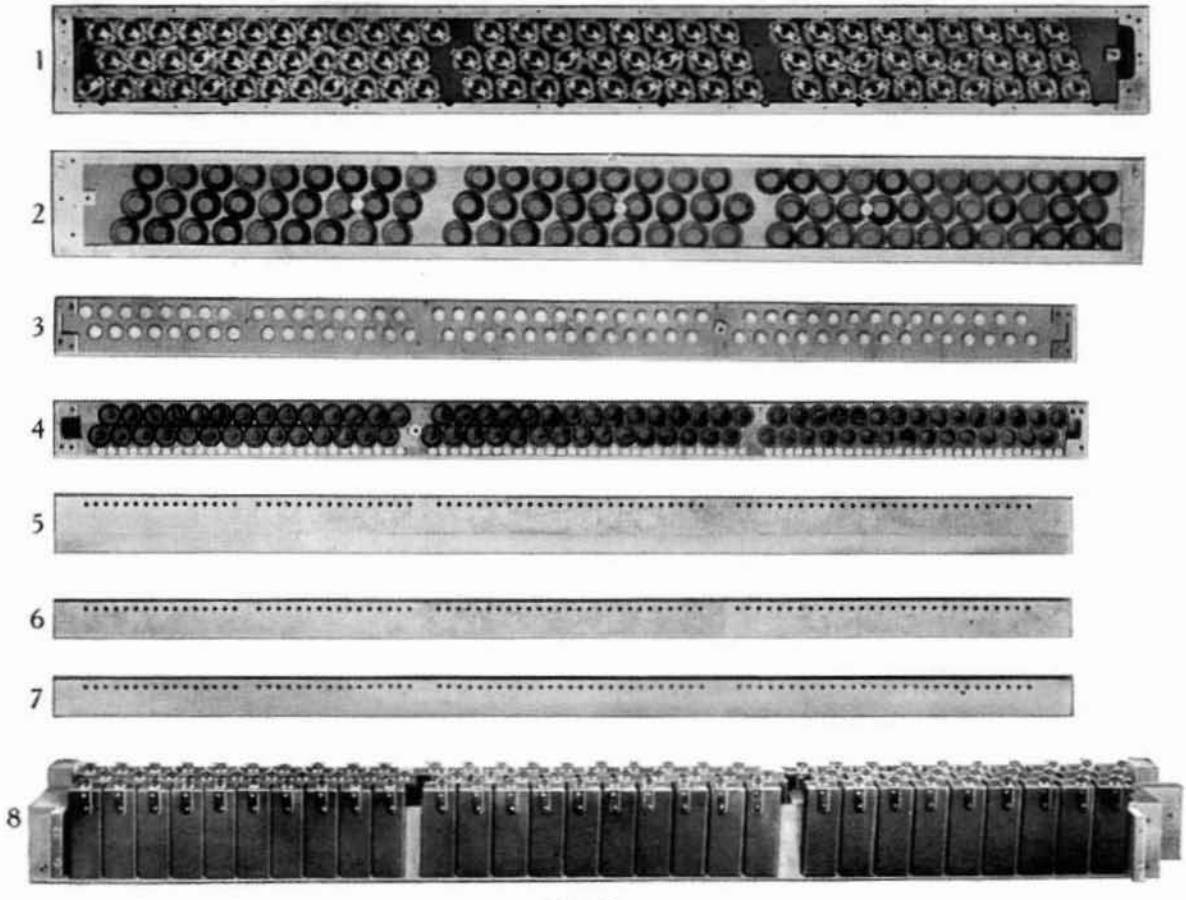
Cut 11

Pneumatic Valve and Diaphragm Boards

The accompanying illustration shows the various Valve and Diaphragm, or Pouch Boards, which when assembled comprise the TOP ACTION proper, as shown in cut No. 11, the name of each Board described being opposite its respective number.

No. 1. Secondary Valve Board.
No. 2. Secondary Pouch Board.
No. 3. Primary Valve Board.
No. 4. Primary Pouch Board.
No. 5. Upper "L" Groove Board.
No. 6. Metal Tubing Channel Board.
No. 7. Lower "L" Groove Board.
No. 8. Pneumatic Shelves.

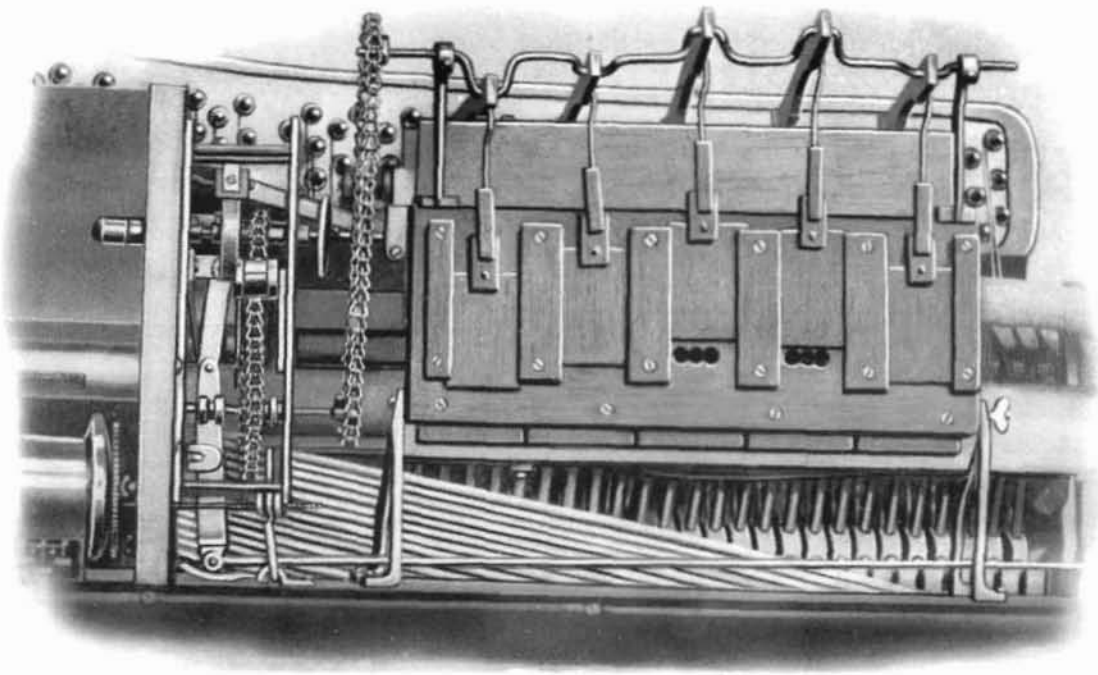
These Boards, when assembled, form the complete set of pneumatics and, as such, distribute and regulate the Pneumatic energy which strikes the notes through general operation, as shown by the red arrows in the full size sketch on page No. 13.



Cut 12

Motor

(PATENTED)



Cut 13

The Motor is of the "five point" type which is universally conceded to be the nearest to mechanical perfection and to operate with the minimum amount of friction, combined with the highest degree of efficiency and uniform speed. It is constructed on simple lines with no complicated parts and is wonderfully strong. This can be readily understood when it is noted that the Motor is built up in cross banded mahogany five-ply sections, glued and screwed together in a scientific manner so that it is absolutely air tight. The Motor and its component gears are closely coupled together and are warranted absolutely noiseless.

Care of the Motor

Our Motor is constructed so simply that the chance of its needing any attention whatever is very remote.

The Gears and Sprockets to the left of the Motor may be occasionally oiled—use but very little and see that these Parts are kept clean and free from rust. Never use oil or grease on motor valves, use a little Graphite or Talcum Powder.

A most important feature and one that will immediately appeal to Tuners in particular is that it is unnecessary to remove any part of our Action for the purpose of tuning the piano. To obtain clearance behind the Motor, all that is necessary is to release the Chain on the left-hand side connecting with the Gear Set and likewise detach the Tubing on the right side of the Motor. Then, by simply turning the Thumb Screw on the right hand Bracket to the left, the Motor can be tilted forward at any desired angle. Care should be taken in seeing that the Motor and the disconnected parts are replaced in their original positions and the Thumb Screw properly tightened so that nothing will become loosened thereafter.

Playing Levers

Cut 14

In the section of the piano in front of the Keys is the hinged lid known as the Key-slip and under this are the controlling Levers to operate the Player Action, which are called the Reroll, Tempo, Soft Treble, Soft Bass and Loud. By the use of these Levers the operator can obtain any desired result, and as the construction is on simple and direct lines, there is but little possibility of any of these important attachments getting out of order, as frequently happens where complicated devices are used.

Another important feature, and one obtained only by the use of Levers, is that they make possible a gradual use of the Soft Bass and Soft Treble. In other players where Buttons are used the operation is total, that is, there is no chance of any but a full softening or release by the player who wishes to modulate tones. The advantage of the Lever is instantly obvious.

A feature which will appeal to manufacturers and installers is that all the Lever Rods and connecting Wires are in straight lines. As a consequence, the installation is very much simplified.

The Reroll Lever controls the rolling and rerolling of the music. When at the left end of the slot the music rewinds on to the spool as the operator pumps lightly. Care should be taken always to push the lever to the end of the slot.

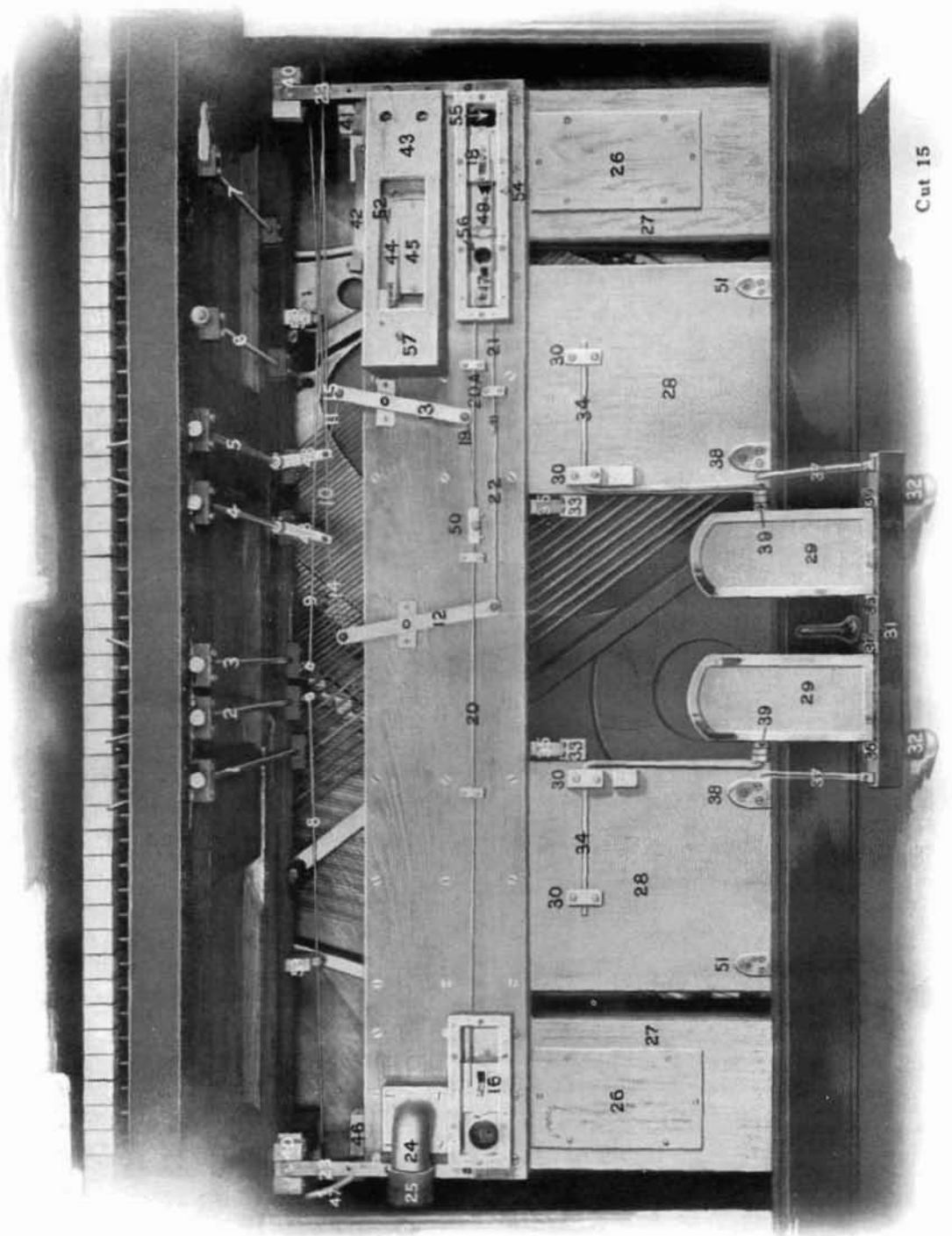
The Tempo Lever determines the time with which the music rolls move and therefore the time of the music. It is the Throttle Valve and is connected directly with the governor.

The Soft Treble and the Soft Bass subdue their respective notes permitting the most harmonious combinations and are a great aid in accompanying.

The Loud Lever is naturally for emphasis and its use enables the operator to obtain all the loud pedal effects possible in a manually played piano.

BOTTOM ACTION

Front View, Showing Number of Parts



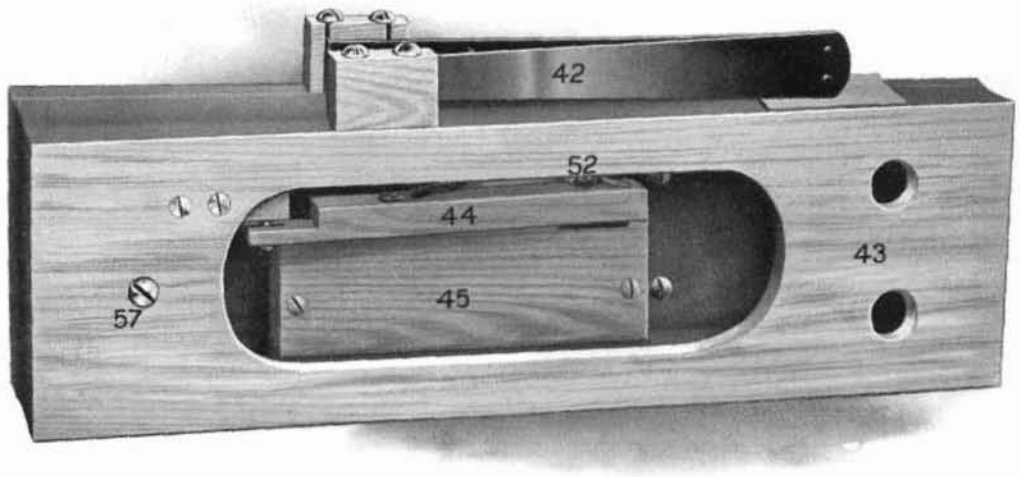
These will identify the parts of the Bottom Action and are not to be used when parts are wanted for replacement—see page 27 for latter.

BOTTOM ACTION

Numbers for Bottom Action (Cut 15)

1— Loud Pedal Lever Rod.
2— Soft Bass Lever Rod.
3— Soft Treble Lever Rod.
4— Tempo Lever Rod.
5— Reroll Lever Rod.
6— Keylock Pull.
7— Sliding Panel Rod.
8— Connection Rod for Soft Bass.
9— Connection Rod for Soft Treble.
10— Connection Rod for Tempo Indicator.
11— Connection Rod for Reroll.
12— Tempo Shifter.
13— Reroll Shifter.
14— Wire connecting Arm on No. 4 with Shifter No. 12.
15— Wire connecting Arm on No. 5 with Shifter No. 13.
16— Gate Box Valve.
17— Reroll Valve.
18— Tempo Valve.
19— Wire connecting Shifter No. 13 with Wire No. 20.
20 & 20A Connecting Wire between Valve No. 16 and No. 17.
21— Pull Wire for Valve No. 18.
22— Connecting Wire between Shifter No. 12 and Wire No. 21.
23— Steel Bottom Action Braces.
24— Cast Elbow for Gate Box.
25— Rubber Tubing Exhaust from Secondary Pneumatics of Top Action.
26— Panel Door on Receivers.
27— High Tension Receivers.
28— Feeder Pumps.
29— Treadles.
30— Blocks to support Treadle Hangers.
31— Treadle Base Bar.
32— Supports on Treadle Bar.
33— Blocks for Feeder Springs.
34— Treadle Hanger Rods.
35— Feeder Springs.
36— Treadle Standards.
37— Treadle Arms.
38— Feeder Standards.
39— Treadle Links.
40— Support Blocks for No. 23.
41— Cast Governor Elbow for Exhaust Tube from Motor.
42— Governor Springs.
43— Governor Pneumatic.
44— Governor Valve.
45— Channel Block for No. 44.
46— Nipple for Shifting Device Tube.
47— Rubber Tubing to Shifting Device.
48— Metal Arms on No. 4 and No. 5.
49— Tempo Slot to Bellows.
50— Coupler for No. 20 and No. 20 A.
51— Casting to support Feeders.
52— Hinge screws for Governor Valve.
53— Guide Block for No. 8 and No. 9.
54— Valve Box.
55— Exhaust from motor.
56— Vent to Bellows when Rerolling.
57— Regulating screws for Governor.

Governor



Cut 16

The function of the Governor is to maintain the desired tempo irrespective of the force or pressure of air as applied through the Treadles.

Without the Governor the tempo would vary with the rapidity of the pedaling.

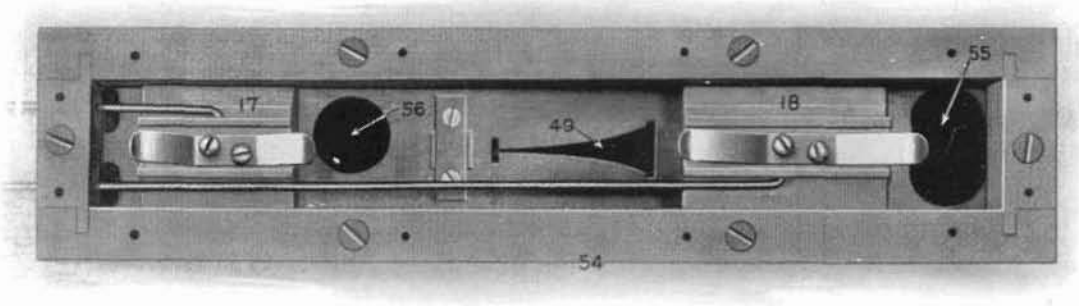
The Governor operates in the following manner: Fast pumping exhausts the pressure in the Governor Pneumatic No. 43 causing it to partially collapse and by so doing push the Governor Valve No. 44 across the ports in the Channel Block No. 45. The Governor Valve is pinioned on screw No. 52 at one end and is slotted at the other where it connects with the moveable top of the Governor Pneumatic.

It is not necessary to take the governor apart in order to regulate it. If the motor shows undue retard or acceleration take out the spring; and weaken it to retard or strengthen to accelerate.

Screw No. 57 located on the outside of the Governor regulates the amount of the cut-off by the Governor Valve No. 44.

This method of regulation is simple, positive, accurate and overcomes many of the defects of the old style enclosed Governor.

Valve Chamber



Cut 17

From the Governor the air passes to the valve chamber directly connected with the bellows. In the valve chamber is the tempo valve No. 18, the throttle valve of the motor, which determines the amount of air admitted at the various tempos and also the reroll valve No. 17. These valves have a sliding motion and are operated by the levers on the Key-slip.

Bellows

The Bellows in the lower action which are connected directly with the treadles are the terminal of the tubular and valvular system of the player piano. When pumped they draw air from all the chambers and tubes in the player thereby producing the vacuum which is necessary to operate the player.

The Bellows are constructed of the best quality of double rubber cloth reinforced at the corners and the possibility of cracking on the folds is thereby eliminated.

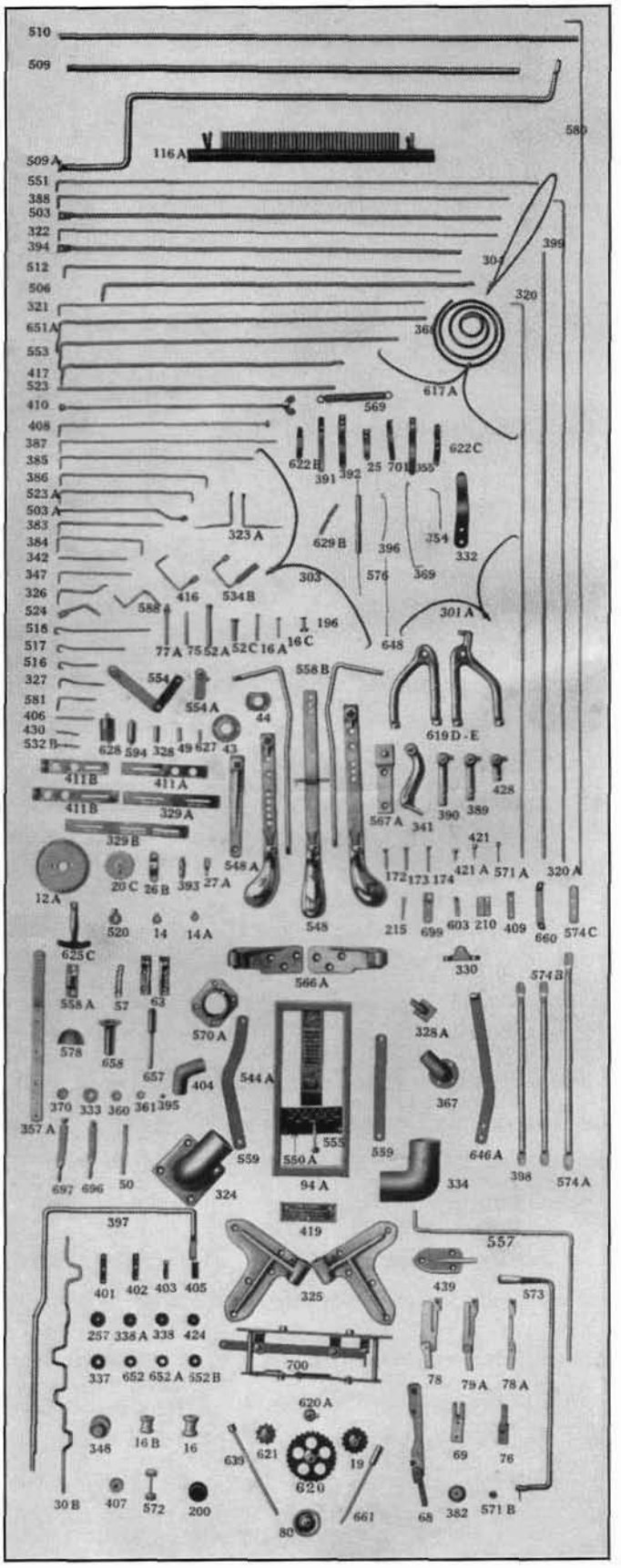
To remove Bellows disconnect wires Nos. 14 and 15, detach motor tube attached to Governor Elbow No. 41, Shifter Exhaust Tube No. 47, and the Secondary Pneumatic Exhaust Tube No. 25. Take out screws in No. 40 at the end of the wind-chest, tip Bellows forward and lift out.

Cut 18

Photograph of Parts Used in Construction of Player Piano Mechanism

Order by Number

List on Following Pages



List and Numbers of Parts

See Photograph on Opposite Page. (Cut 18)

12A	3-in. gear wheel on end of spool
13B	Pinion on gear frame
14	Collar for No. 661
14A	Collar for No. 523
16	Large idler spool
16B	Small idler spool
16A	Long pin for idler spool
16C	Short pin for idler spool
19	Sprocket for reroll
20C	Sprocket for 5 point motor
25	Spring for take-up spool
26B	Bracket for take-up spool
27A	Hook for take-up spool
30B	5 point motor shaft
43	Brass cups for valve
44	Special cups for valve
49	Brass tube for soloist connection
50	Lead tubing
52A	Fluted rivet for treadle links
52C	Plain rivet for treadle links
57	Chain for motor
63	Standards for treadle links
68	Long motor arm
69	Flange on shifter box
75	Pedal block pin
76	Short motor arm
77A	Music spool pin
78	Striker reg.
78A	Striker small
79A	Striker medium
80	Brake wheel
94A	Pedal frame
116A	Tracker bar
200	Knob for keylock pull
257	Fibre washer, ¾ x 25 hole
301	7-lb. spring
301A	8-lb. spring
303	14-lb. spring
304	Spring, inward press spring
320	30-in., divided rail connection wire
320A	36-in., divided rail connection wire
321	Divided rail connection wire
322	Loud pedal connection wire
323A	Wires for divided rail
324	Gate box tubing
325	Casting in back of pumps
326	Adjuster brace
327	Wires for motor
328	5/16-in. brass tubing
328A	5/16-in. cast elbow
329A	Lever plate
329B	Lever plate
330	Center pedal standard
332	Trap work spring
333	Metal washer for treadle
334	Cast elbow
337	Fibre washer for treadles
338	Fibre washer, 11/16 x 25 hole
338A	Metal washer, 11/16 x 38 hole
341	Bracket for motor shaft
342	Wire for break or take-up spool
347	Wire for shifting device
348	Wooden plug for treadle bar
354	Wire spring for solo boxes
355	Flat blued spring for solo boxes
357A	Steel bellow support
360	German silver washer for No. 43 cups
361	German silver washer for No. 44
367A	Small cast elbow
368	Compression spring
369	Steel wire spring for bellows
370	Gauze wire washer for shifter
382	Buttons for valve stems
383	Conn. wire for rewind and tempo
384	Conn. wire for rewind and tempo
385	Conn. wire for rewind and tempo
386	Tempo conn. wire
387	Tempo conn. wire
388	Rewind conn. wire
389	Rewind and tempo finger
390	Loud pedal finger
391	Governor valve spring
392	Spring for shifting box
393	Coupler posts
394	Tempo and rewind rod
395	Small brass vent caps
396	Wire spring for receiver
397	New style sliding panel lever
398	New style sliding panel lever connection
399	New style sliding door rod
401	Fibre bridge regular
402	Fibre bridge small
403	Fibre bridge short
404	Small elbow
405	Soloist button
406	Soloist wire
407	Governor stop block
408	Loud pedal wire connection
409	Short angle for loud pedal connection
410	Adjusting rod for new motors
411A	Lever plates for 2 Button type
411B	Lever plates for 2 Button type
416	Rocker for choker bellows
417	Lever for choker
419	Shifting box plates
421	Capstan screw regular

Continued on Page 28

List and Numbers of Parts

(Continued from page 27)

421A Capstan screw small
424A Metal washer 5/8 by 3/8 hole
428 Special loud pedal finger
430 Threaded wire for soloist box
432 3/8 x 18 Nickel plated Escutcheon Pins
433 Bent Tubes
435 Plates on Motor
439 Casting to support feeder
442 Soloist Brackets
450 Brass Tubes for Loud Pedal Pneumatics
451 Rubber for Loud Pedal Pneumatics
452 Valve Button
503 Loud lever
503A Loud lever conn.
506 Soft Lever Rod
509 Soft pedal wire
509A Center pedal wire
510 Loud pedal wire
512 Wire for reroll lever, top
516 Wires for pneumatics
517 Wires for pneumatics
518 Wires for pneumatics
520 Collar for treadle
523 Threaded wire for keylock pull
523A Threaded wire for No. 523
524 Hook for keylock rail
532B Valve stems
532C Valve stem washer
534B Brake for shifter
544A Patent plate
548 Pedals
548A Pedal arms
550A Tempo indicator
551 Wire for tempo tracer, bottom and top
553 Wire for tempo indicator
554 Arm for tempo indicator
554A Arm for tempo indicator
555 Enameled indicator finger
557 Treadle hanger
558A Socket for No. 558B
558B Treadle arm
559 Straight and bent treadle links
566A Casting to hold pumps
567A Casting to hold No. 566A
569 Spring for sliding panel
570A Cast nipple for wind trunk
571A Regulating screw
571B Regulating button
572 Primary buttons and stems
573 Sliding panel lever
574A Wire strip for sliding panel
574B Wire strip for sliding panel
574C Wire strip for sliding panel
576 Muffler spring
578 Rubber screw knob for treadle bar
580 Muffler wire
581 Wire for center pedal conn.
588 Hooks for hammer rail
594 7/16-in. nipple for soloist
603 Metal clips for No. 534B
617A Governor spring
619D Iron bracket for motor
619E Iron bracket for motor
620 Large sprocket for reroll
620A Large hub for No. 620
621 Small sprocket for reroll
622B Spring for motor valve
622C Spring for rewind motor
625C Cam for shifter device, long
627 11/16-in. brass nipple
628 Brass nipple for 3/4-in. tubing
629B Spring for Nos. 657 & 658
639 Shaft for take-up spool
646A Brace for spool box
648 Spring for idler spool
651A Rod for shifting device
652 Fibre washer for No. 557
652A Fibre washer for No. 558
652B Fibre washer for No. 557
657 Plunger for No. 658
658 Socket for left of music roll
660 Brace for L of sliding panel
661 Clutch socket for right of music roll
696 Short lever handle, 3 1/8-in.
697 Long lever handle, 3 3/8-in.
699 Hanger for pneumatics
700 Gear frame
701 Spring for gear frame