

PRACTICAL GUIDE

For the

REGULATING OF
PLAYER-PIANO
MECHANISM



HOW TO REMOVE THE TOP ACTION
TO THE TUNER AND REPAIR MAN

INTRODUCTION



player piano with its delicate action, must receive the same amount of care and attention that is given other fine mechanism; otherwise it cannot be expected that it will perform its work in a first-class manner. If you have a fine watch, you take pains to have it cleaned and oiled regularly. *Then why not give the same care to your player piano action.*

It is necessary that every bearing of the music spool, driving gear, and the treadle parts, should be kept cleaned and oiled, and also the front boards of the pneumatic action should be taken off at least once a year and all the dust blown out of the channels and about the valve seats. The piano should be kept in tune and the action nicely regulated if you expect to have good music and a responsive player. To keep a piano in a damp room or one that is overheated is ruinous to the instrument. Moderation in all things brings forth good results.

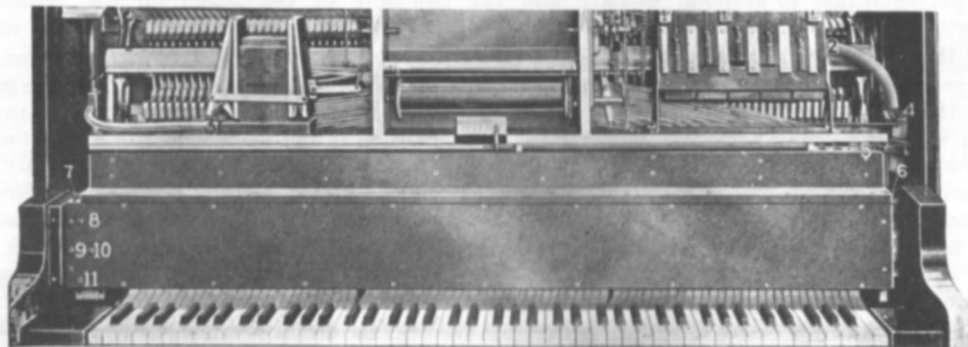
The drawings or cuts on the following pages will give you a clear insight into our player piano mechanism. All the various parts are numbered and on another page you will find their proper names. Should occasion require your ordering any of these parts of the player, always give name, and part number.

TO THE TUNER AND REPAIR MAN

As the player piano is the piano of the day and grows each year more popular with the music loving public, you will be called upon to care for these instruments, and a little knowledge beforehand may serve you well. Having this in mind we arranged the following cuts in the simplest and best form to give you all the knowledge possible. If you will give this book a little study and careful reading, you will soon learn how simple the Auto Pneumatic Action is and on what scientific lines it is built. Our Inventor has made this action a life study and each section of it has been considered from every view point of durability and endurance.

Don't try to change the Inventor's ideas without considering thoroughly what may happen at the other end after you have made the change. Others have tried it and made dismal failures of the experiments. This same advice is applicable to nearly all inventions, especially player pianos. If a player piano is out of order and you are called upon to fix it, don't pull the mechanism all apart until you have first tried to play it. Study the trouble a few minutes and see why such a trouble should occur. Having diagnosed the case, then go to the part or section of the mechanism that you feel is causing the trouble and try and overcome same. In hundreds of cases the turning of some small screw or the adjustment of a bearing will remedy the trouble. **THINK TWICE** before you **BEGIN TO TEAR** the instrument apart. Remember that the player action does not have to be removed when tuning the piano. There is ample room for your wedges (or dampers), also the tuning hammer. Read the instructions on the following pages how to care for the various sections of the Auto Pneumatic Action, they will interest you.

HOW TO REMOVE THE TOP ACTION



CUT ONE

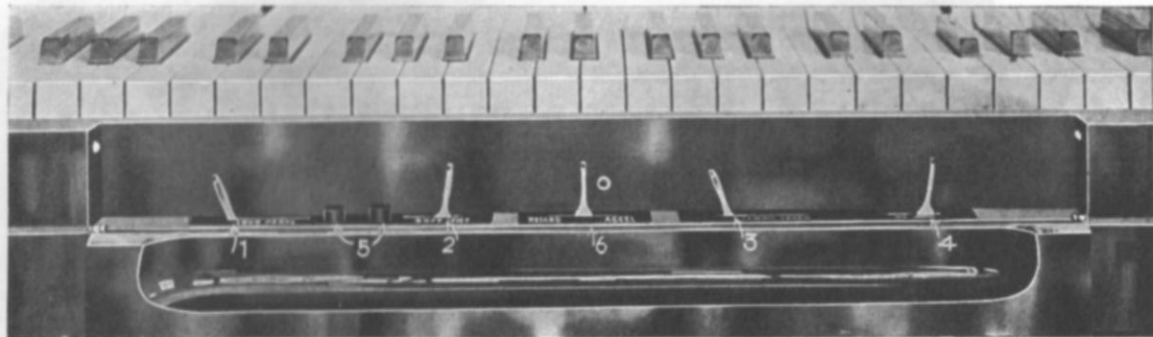
Take out the top frame (or panel) of piano, also the fall board (or lid). Take out screw in metal brace on left hand side of spool box which is screwed to the iron piano plate. Disconnect rubber tube No. 2 from motor, also rubber tube No. 3 from the shifter pneumatics. Remove the leather nuts from the reroll wire No. 4 and Tempo Indicator connection No. 5. Unscrew the large screws No. 6 and No. 7 at each end of action, also the oval head screws 8, 9, 10 and 11 at bass end. Take

hold of 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 8, 9, 10 and 11 fairly tightened, also screws 6 and 7. Be careful in slipping on the rubber tubes 2 and 3 and see that they fit snugly to their respective parts. Don't meddle with the Indicator pointer.

EXPRESSION LEVERS AND SOLOIST BUTTONS

No.

1. Loud Pedal or Sustaining Pedal.
2. Soft Bellows and Accent.
3. Tempo Indicator.
4. Re-Roll.
5. Soloist Buttons,
Soft Bass,
Soft Treble.
6. Tempo Modulator.



CUT TWO

PRIMARY AND SECONDARY ACTION

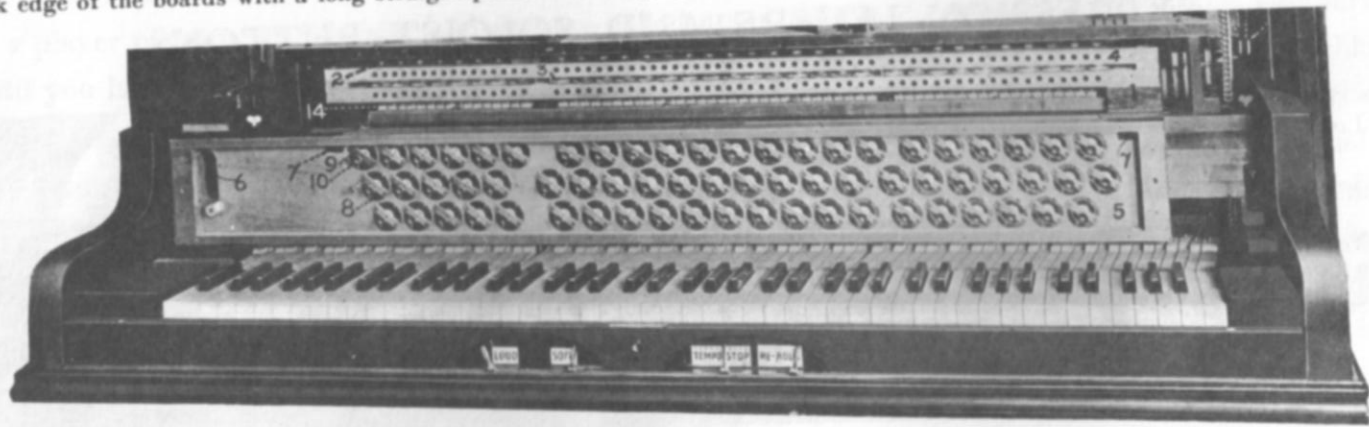
HOW TO REGULATE AND ADJUST SAME

Should some of the notes in the player refuse to respond quickly and the hammers of the piano do not return immediately to the hammer rail, it is a pretty sure sign that there is either dust under the Primary or Secondary valve, or else they do not seat properly, or possibly the vents are clogged with dirt.

Counting from the bass end of your piano locate the note or notes that are not playing freely. Then count again from the Bass end the wooden primary buttons No. 2 and see if the valve corresponding to the piano action, is seating properly. Should it not seat properly, if you will take a fine wire and bend a right angle turn on it and work it gently under the top button you will remove any particles of dirt that may have settled there and your instrument will again play perfectly. Should you find however, that the trouble is not with the primary valves examine the valves 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 do not rest or seat properly on their metal cups, caused possibly by the hardening of the leather on the valves, the action will leak. By drawing the valve forward gently you can readily see if the valve does not seat properly. If the valve is not seating straight on the valve cup, take a pointed tool and push back gently the side of the valve that is not seating and straighten it. This can easily be done as the valve is flexible and there is no risk. The wooden button No. 10 on the valve stems may be screwed in a trifle. It should be a little below a straight edge held across the valve chest. The cloth punching on the button is not to be considered. With a small pair of pliers take a tight hold of the wire stem and give the button a three-quarter turn to the right. It is necessary to do this when the distance between the button and pouch has lessened by the contraction of the pouch. If it becomes necessary the metal cup can easily be removed and the valve replaced.

The vents are in the lower board of primary action No. 1. See to it that they are free from dirt and are not clogged up.

In very rare cases the primary box boards might draw in different directions. Take a slight shaving off the front and back edge of the boards with a long straight plane. Truing up these boards will make the action tight and more responsive.

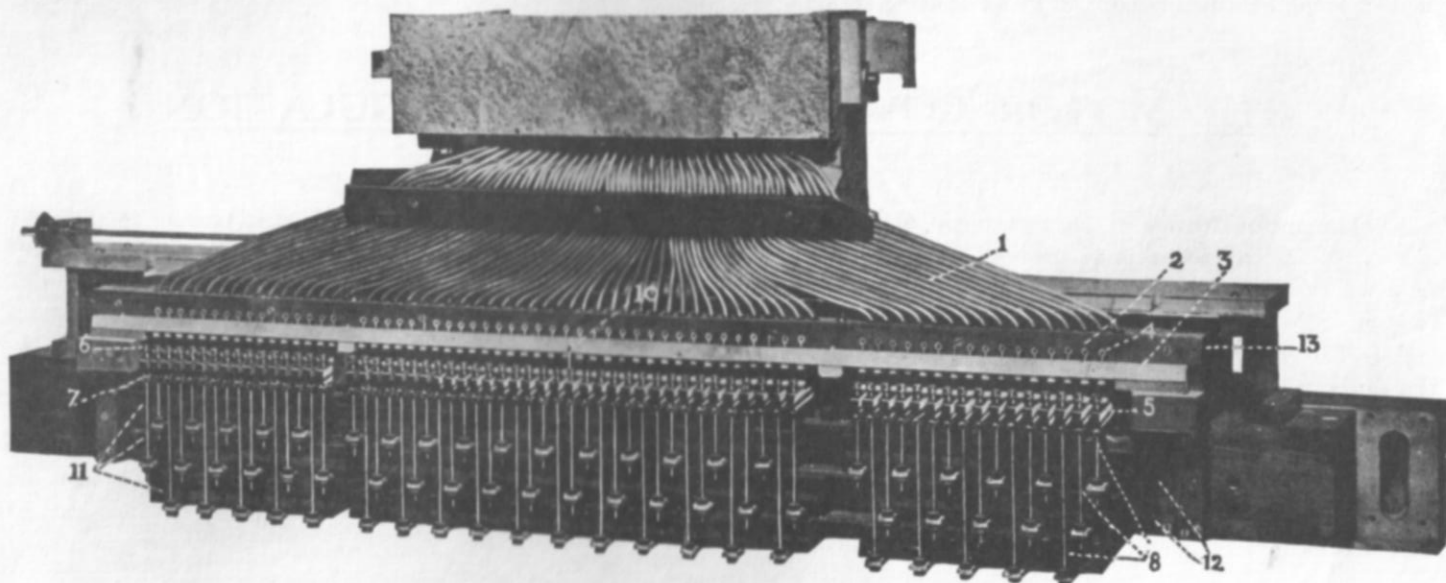


CUT THREE

REAR VIEW OF TOP ACTION

The whippens or butts of the piano action should rest lightly on the capstan screws No. 6 in Flexible Strikers No. 5 and the regulating screws should be set so as not to allow the strikers to travel too far and over exert the piano action. It will be seen at a glance how easy it is of regulation. Press down piano key and pull up striker No. 5 until it is as high as the key will lift piano action, then set regulating screw accordingly. If the leather nuts on pneumatic wires No. 8 are loose, tighten them but don't tighten too much, otherwise they will bear too hard on the hinge of the pneumatics. It might be well to tighten up the screws in Tube rail No. 2. By taking off regulating rail No. 3 you will have a full view of the screws in Tube Rail No. 2.

The button on the regulating rail is 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 the key. Turn the regulating screw either to right or left until the desired regulation is obtained.



CUT FOUR

HOW TO REMOVE THE BOTTOM ACTION

To remove the bellows disconnect Wires 13-16-21-22-23 and 24. The two Soloist Tubes 33, one at each end of wind chest, Motor Tube 19, also tube 12. Take out screws No 37 and 38 at end of wind chest. Tip bellows forward and lift it out. The bellows are made of three ply cross banded stock and the folds of the best quality double texture rubber cloth, reinforced at the corners with gusset leather. In building our instrument particular care has been taken regarding the relative size of pumps and reservoirs to insure convenient and not tiresome operating of the bellows.

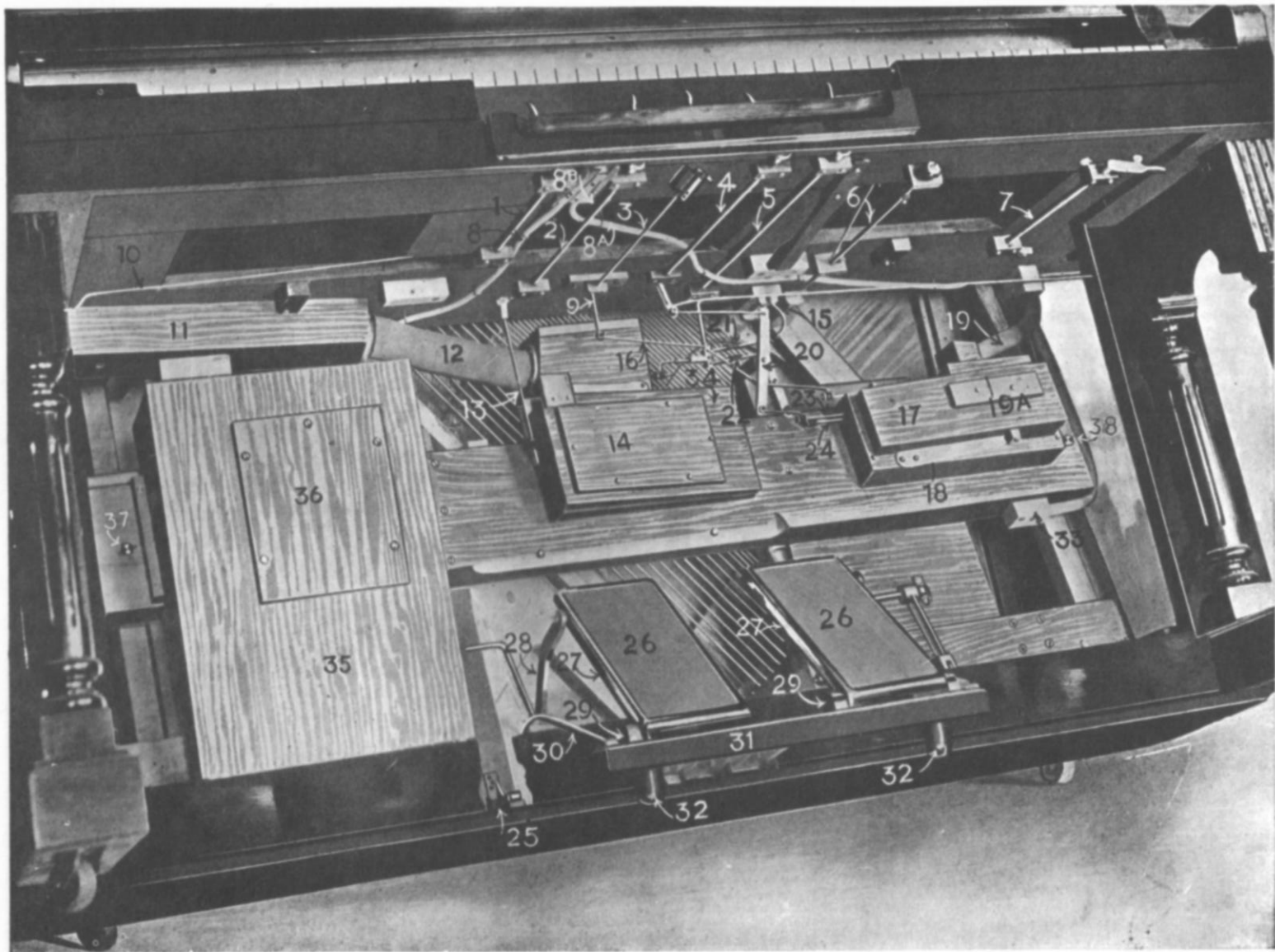
With our AUTOMATIC EXPRESSION PNEUMATIC, a pneumatic and valve located inside of reservoir, the operator may at any time, even when pumping lightly, instantly with a powerful stroke on the treadle produce an accent or crash effect.

The treadles are encased in a steel frame, connected to the bellows by steel links and are constructed to fold into the case low enough to use an up and down sliding panel or door which is operated by a handle conveniently located under the key bottom. This enables the performer (the treadles being pushed in or out with the foot), to open or close the door without stooping. This panel should appeal to all our patrons, also the fact that the sliding door may be partly let down while playing, being held in any position by a balancing spring.

THE MOTOR GOVERNOR AND ITS REGULATION

NO. 17 IN CUT FIVE

The spring tension of the motor governor should have about the equal strength of a very soft tension in the main bellows. This equalizing is to prevent the speeding of the motor during an increased tension in the main bellows. If the motor runs too slow the spring No. 18 Cut 5 should be stiffened, and if too fast the spring No. 18, Cut 5 should be weakened. The spring No. 18 should be taken out and if too heavy or stiff, take the spring in both hands at each end and bend back slightly. If on the other hand the spring should be weak, hold it in both hands and bend it forward and give it more curve. You can accomplish the same results by laying spring No. 18 on a bench and hammer it on whichever side is necessary. Should the tempo be wrong, take off the Governor and remove tempo valve slide on wire No. 23. If the tempo is too fast at the beginning glue on a very thin piece of leather at the upper end of the throat of the valve to nearly the lower end. If it is running too slow, cut out a very slight shaving. Much care and judgment should be used in this work. To take out Governor, take off rubber tube No. 19 and the leather nuts on wires 23 and 24 and two screws under cap No. 19A and the outer screws.



CUT FIVE

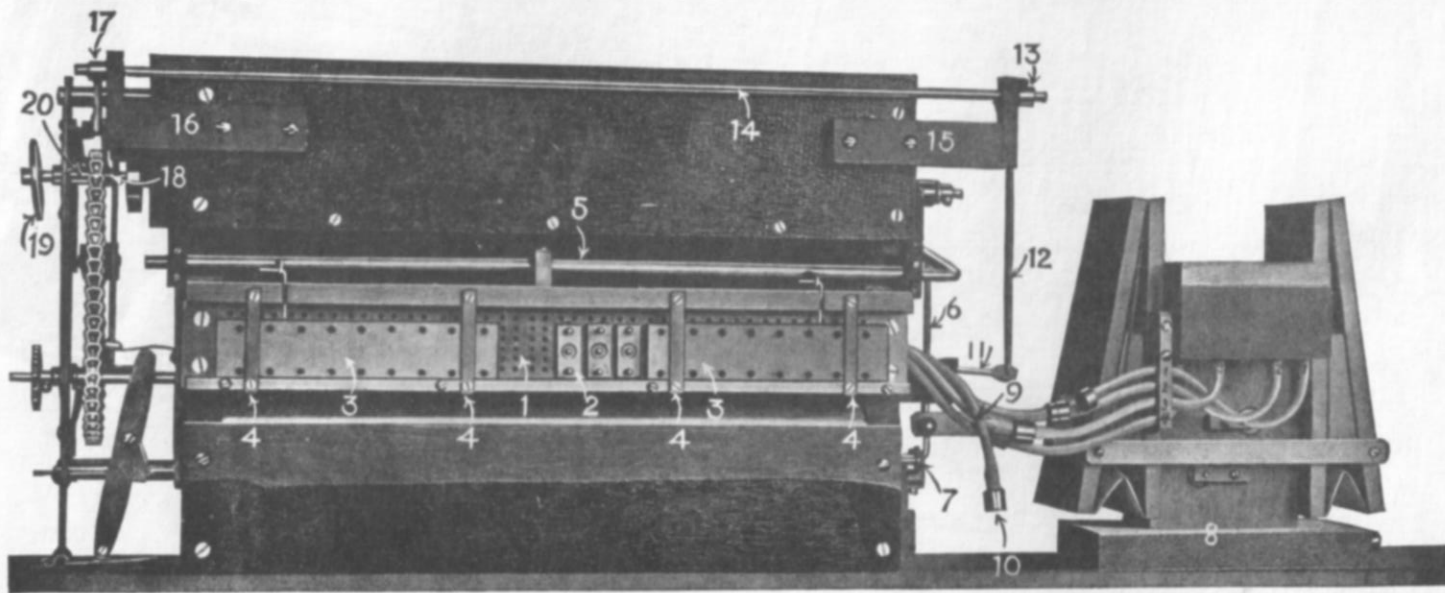
REAR VIEW OF MUSIC SPOOL BOX SHOWING THE COMBINATION 65-88 NOTE SHIFTER - ALSO AUTOMATIC TRACKING DEVICE

THE SHIFTING BAR

The main body of the shifting bar No. 1 is made of metal and is stationary. The shutter No. 2 or sliding valves are also of metal and can easily be removed and cleaned. To remove valves take out the lower screws in the bars No. 4 and swing them up so as to clear valve bar No. 3. Take out tapered pin in shaft 5, slide to the left until right angle wires in bar 3 are freed. This being done let the bar No. 3 tilt forward and lift out. Try and keep the valves in their original positions. Wipe off bar No. 1 and valves No. 2 with dry cloth and clean dust out of valves and bar, then replace. The tubes from the Tracker Bar lead to the Sliding Bar No. 1 from the front side.

REAR VIEW AUTOMATIC TRACKER PNEUMATICS

In the event of the pneumatics not working properly loosen the rubber tubes No. 9 at couplings No. 10 and blow the dust out, cleaning only one tube at a time to avoid changing them. See other views for further reference.



CUT SIX

CROSS SECTION VIEWS OF AUTOMATIC TRACK PNEUMATICS

NEW MODEL

(Note difference from cut 6)

THE AUTOMATIC SHIFTER

Atmospheric conditions and uneven winding of music on the spool tend to prevent the holes in paper coming directly over the holes in the tracker bar and it is the purpose of this shifter to keep them in perfect alignment at all times, which is very essential for good results in 88-note players because of the small openings. As the music shifts from side to side it uncovers the guide openings in tracker and the music is brought back into proper alignment. When the music is wide the inside holes are usually not brought into action and the outside holes perform the desired functions.

Tubes 7A to 7B (see cut 8) are connected to the inside holes on tracker, No. 7A to right and 7B to left while 6A and 6B are connected to the outside holes 6A to left and 6B to right. Tube No. 3 (cut 8) is the exhaust tube and is connected to wind chest.

As the music uncovers for example the left outside opening air rushes in through it and into tube 6A raising pouch No. 10 cut 7 and passing through No. 12 raises pouch No. 5 which raises valve No. 4 and closes off vacuum chamber from pneumatic and opens pneumatic to air which rushes in through felt cover over the valves and forces pneumatic open, thereby pulling on connecting rod No. 6 (cut 11) page 11 which operates the bell crank No. 11 (see cut 6) pulling down on wire No. 12 to arm No. 13 on rod No. 14 rotating arm No. 17 which is connected to arm No. 10 (cut 12) on cam shaft. On the outside end of this shaft a plane cam is located. The right spool socket shaft is held against this cam No. 19 (cut 6) by a spring in left socket No. 11 (cut 11) and as this cam is rotated by shifter the spool is moved from right to left (or the reverse if the right outside port had been uncovered) thereby bringing paper back into proper alignment.

When the paper shrinks so as to uncover both outside holes, both valves No. 4 (cut 7) will be raised and each pneumatic will be open to atmospheric pressure.

As the paper now shifts it will uncover say for example the right hand inside hole. Air is immediately admitted into tube No. 7A (cut 8), onto pouch No. 9 (cut 7), which forces down button No. 8 onto pouch No. 10 thereby closing off passage No. 12 from No. 6. Left valve No. 4 is now drawn down by the vacuum and the pneumatic No. 1 (cut 8) is exhausted allowing the right pneumatic which is full of air to open wider against the resistance of decreased pressure in the left pneumatic and through the before mentioned linkage, the music is again brought into proper alignment.

CUT SEVEN

closing off passage No. 12 from No. 6. Left valve No. 4 is now drawn down by the vacuum and the pneumatic No. 1 (cut 8) is exhausted allowing the right pneumatic which is full of air to open wider against the resistance of decreased pressure in the left pneumatic and through the before mentioned linkage, the music is again brought into proper alignment.

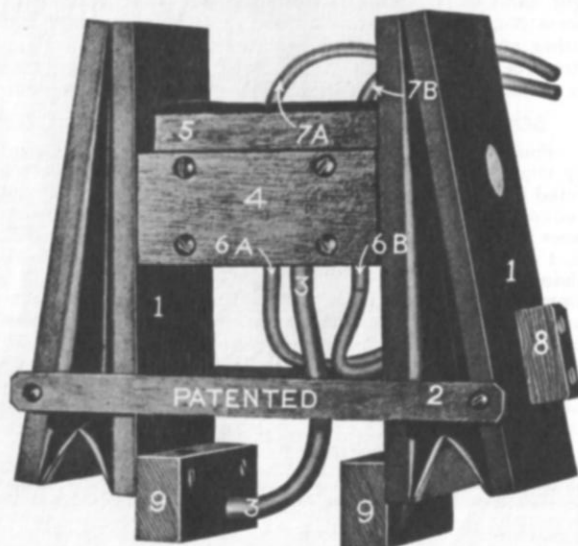
ADJUSTMENT OF SHIFTER

See Page 8 -- Cut 6

Place the end of a piece of rubber tubing over openings in the tracker and after removing No. 10 (cut 6) blow through each hole one at a time to free the passage from any obstruction. Before replacing brass couplings No. 10 be sure that the screen in coupling is clean and free.

In case inside holes do not work satisfactorily:

Remove cover No. 5 (cut 8) clean under valves any dirt that might have settled there. A fine piece of wire is the best to use. Disconnect 6A and 6B and remove front No. 4 (cut 8). Blow through 6A and 6B to remove any dirt that might have settled under pouches No. 10 (cut 7.) All metal to metal bearings on linkage should be oiled occasionally.



CUT EIGHT

CROSS SECTION VIEW OF SOFT PRESSURE BELLOWS AND SOLOIST PNEUMATICS



CUT NINE

Cross Section of Soft Pressure Bellows See Cut 5 No. 14

ADJUSTMENTS OF SOFT PRESSURE BELLOWS

The only members possible of adjustment are the outside spring and the height of stop No. 6 on the inside. After setting bottom action into piano and connecting No. 4 to operating lever vertical wire adjust the height of No. 4 on this wire by raising or lowering the leather nuts, so that when operating lever is in extreme left position the valve No. 1 is just closed. To test for this setting:—insert a piece of music, remove outside spring on soft bellows and while playing move operating lever to extreme left position. If the music stops just as lever reaches this position the height of No. 4 is right. Replace outside spring in left hand slots and if the desired softness is not obtained move the spring to right hand slots. *NOTE:* Lowering No. 4 on vertical connecting wire lowers No. 6 thereby allowing the valve No. 1 to shut tighter, while the raising of No. 4 produces the reverse effect. Lack of power in blow is often due to the setting of No. 4 on connecting wire so low that valve No. 1 cannot open wide enough to produce desired results.

SOLOIST PNEUMATIC AND HOW TO REGULATE

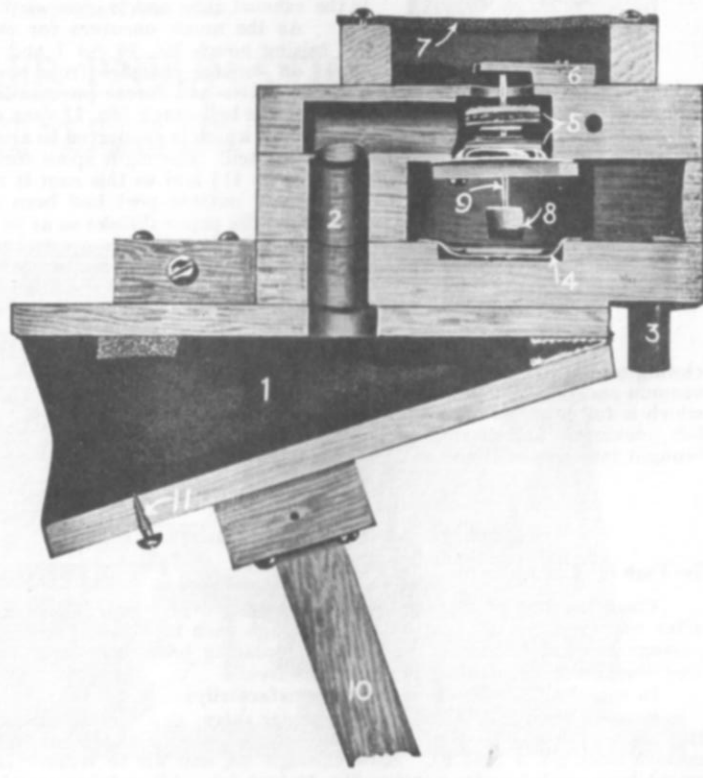
Pouch No. 4 in exhaust chamber is connected to operating button on key slip by rubber tube not shown in cut, and exhaust chamber is connected to wind chest, through tube No. 3. By pressing Soloist button air is admitted under pouch No. 4 raising it against valve button No. 8 which forces valve No. 5 against upper seat, thereby closing off air to pneumatic No. 1 and opening passage from No. 1 through No. 2 into vacuum chamber exhausting air from No. 1 and raising arm No. 10 which is connected to hammer rail. When Soloist button is allowed to come back to normal position it shuts off air from under pouch No. 4. Valves No. 5 are at once drawn down and the lower valve No. 5 shuts off passage into vacuum chamber, while the upper valve No. 5 opens passage into the outer air which rushes in through the felt cover No. 7 and fills pneumatic No. 1. The closing of the pneumatic No. 1 can be regulated by lowering or raising screw No. 11 to allow of the desired pull up on lever No. 10.

The adjustment of valves No. 5 and button 8 is as follows:

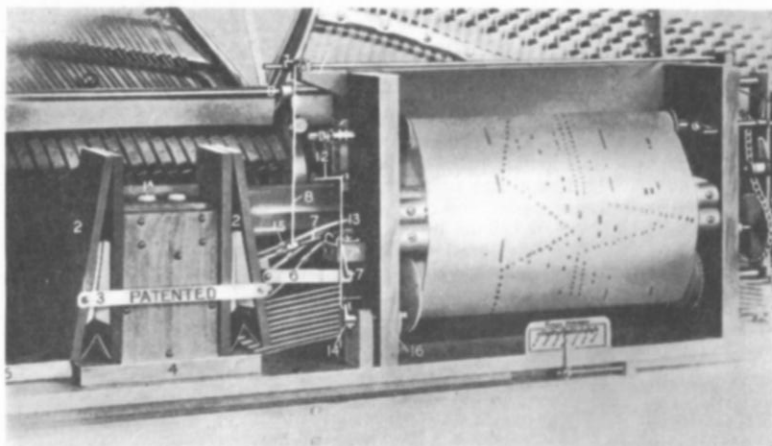
Unscrew Soloist box separating upper two sections from lower section and regulate height of button by holding lower valve No. 5 tightly against metal seat and turning button No. 8 and Stem No. 9 until the felt be just a trifle above the edge of the section. This fixes location of lower valve and when once determined all adjustments for throw of valves are made by pushing upper valve No. 5 against the seat and turning wire stem No. 9 to either the right or left as case requires. The throw or travel of valves should be about $1/16$ " for best results.

The Operation of the Soft Pressure Bellows is as follows:

The air exhausted from the top action passes in through port No. 7 and out through port No. 8 under hinged valve No. 1 held against stop No. 6 by spring No. 2. Stop No. 6 is connected to rocking arm No. 4 which is connected to soft operating lever on front of piano. The bellows is held open by a spring at the top on the outside (see cut No. 5 part No. 14) and when lever is in the *off position* the opening or closing of the bellows has no effect on the operation of the action, as hinged valve No. 1 is held open by stop No. 6. When operating lever is pushed to left No. 4 is pushed downward lowering stop No. 6 and allowing valve No. 1 to rest on stop No. 5. As the pressure varies the opening of the bellows varies, and on harder pumping valve No. 1 is nearly closed thereby throttling the pressure in the top action and softening the blow.



CUT TEN



CUT ELEVEN

in the double guides No. 2 the valves or slides No. 1 can be raised and wiped off with a dry cloth and replaced, NEVER USE OIL OR GREASE ON THE FACE OF THE VALVES. Where the crank shaft No. 5, Cut 12 works in the metal supports No. 4 an occasional drop of vaseline is a good thing. Do not change or bother the chain No. 7 and sprocket wheels 6 and 18 of the motor. The idler on motor takes care of the chain and the slackening. If the valve slides No. 1 warp a little you can straighten or true them up easily. Take each valve off separately,—lay a fine piece of sand paper on a flat surface, place valve on top of paper and gradually work down the face to a true or straight surface. Should the face of the motor need truing remove the valves and slides, numbering each part so as to replace them again properly, lay a piece of fine sand paper over a flat block and rub face of motor until it is smooth and true. Care should be exercised in rubbing so as not to make face of motor uneven.

The Motor is built of the finest mahogany and has a cross banded veneered top, all joints are glued and screwed together, making it impossible to give or warp.

FRONT VIEW OF AUTOMATIC TRACKER DEVICE ALSO
MOTOR AND TRANSMISSION GEARINGS, ETC.

Front View of Old Style Automatic Tracking Device

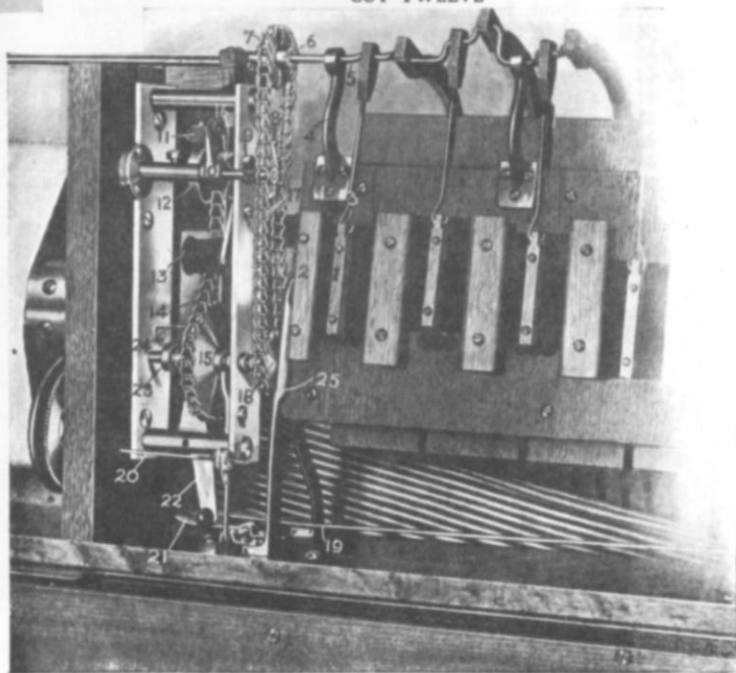
See Page 9—Cuts 7 and 8

For instructions how to regulate, etc. Also page 8, Cut 6 for rear view of Cut 11

THE MOTORS

Our motor having five points and constructed with an idea of its lasting forever is not one that will give you any trouble. If the piano is in a room or place where there is a great deal of dust or dampness it may be necessary to wipe off the valves occasionally and sprinkle a little talcum powder on the valve seat. By unscrewing the small screws

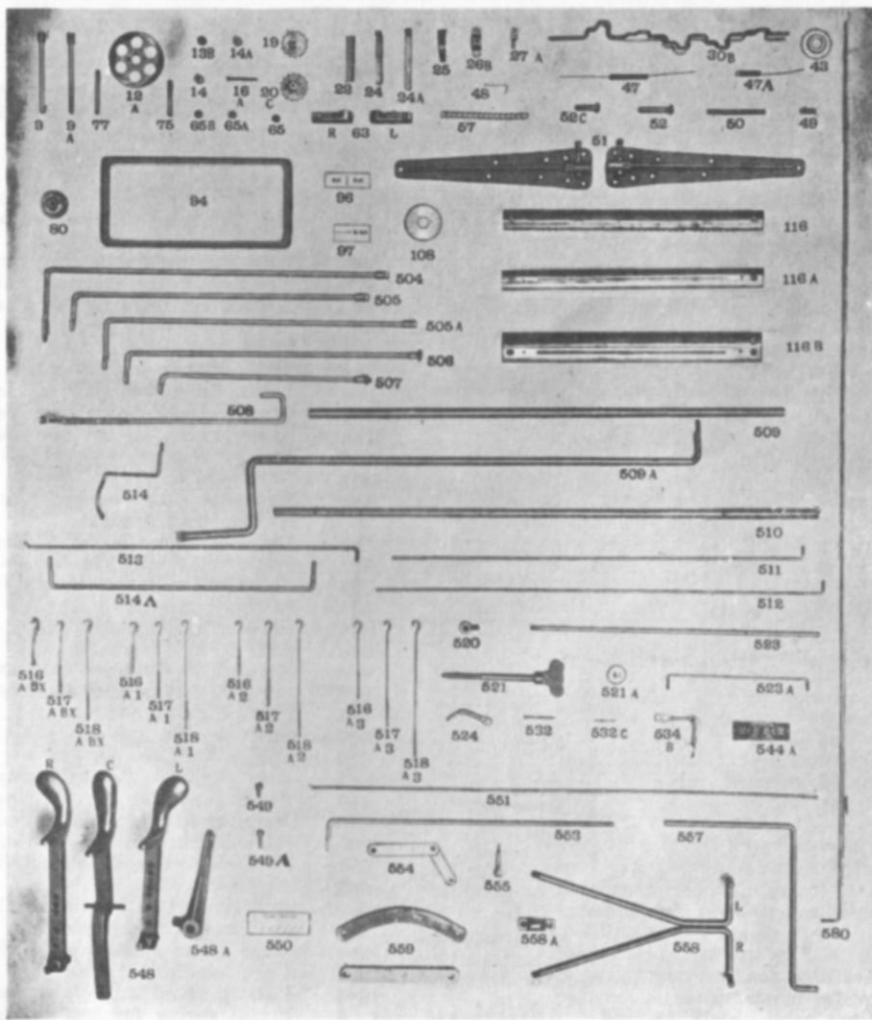
CUT TWELVE



METAL PARTS USED IN THE 65 NOTE, 88 NOTE AND 65-88-NOTE ACTION

SEE CUT 13

<p>No. 9 Right hand socket for music roll, 65-note 9A " " " " " " 88-note 12A Three-inch gear wheel for end of music spool 13B Pinion for No. 12A 14 Collar for No. 9A 14A Collar for No. 523 16A Blank pin for idler wheel 19 Sprocket wheel for reroll 20C " " " motor 22 Spring for reroll 24 " " motor valve 24A " " " " 25 Spring for take-up spool 26B Brackets to hold take-up spool 27A Hook for take-up spool 30B Five point motor shaft 43 Metal valve seat 47 Spring for muffler rail 47A " " soft bellows 48 Spring for striking pneumatic 49 Brass tube for soloist pneumatic 50 Lead tubing 51 Pump braces, right and left 52 Blank pin for treadle lock 52C Blank pin for treadle connection links 57 Sprocket chain 63 Treadle standards, right and left 65 Small leather button 65A Medium leather button 65B Large leather button 75 Treadle block pin 77 Music spool pin 80 Brake wheel 94 Steel rim for treadles 96 Celluloid plate, loud and soft 97 " " reroll 108 Brake feed for take-up 116 65-note tracker bar 116A 88-note " " 116B 65-88-note " " 504 Reroll wire 505 Tempo wire 505A Tempo modulator wire 506 Soft lever wire 507 Loud lever wire</p>	<p>No. 508 Loud pedal lifter wire 509 Soft pedal rod 509A Muffler pedal rod 510 Loud pedal rod 511 Wire for loud pedal connection 512 Wire for reroll connection 513 Reroll wire 514 Rock shaft for reroll 514A Reroll rock shaft for motor valve 516 A BX 2 1/8-inch pneumatic wires 517 A BX 3 3/4- " " " 518 A BX 4 1/4- " " " 516 A No. 1 2 1/2- " " " 517 A No. 1 4 - " " " 518 A No. 1 5 3/8- " " " 516 A No. 2 2 7/8- " " " 517 A No. 2 4 1/2- " " " 518 A No. 2 6 - " " " 516 A No. 3 4 1/8- " " " 517 A No. 3 5 3/8- " " " 518 A No. 3 7 1/8- " " " 520 Collar for treadle wire 521 Thumb screw to secure action, 65-note 521A Washer for No. 521 523 Wire for key lock pull 523A Bent wire for No. 523 524 Attachment for key lock rail 532 Valve stem for No. 3 action 532C " " " No. 4 " 534B Bent wire for brake on reroll 544A Patent plates 548 Three-part horn pedals, right, left and center 548A Arms for No. 548 549 Short capstan screw 549A Long capstan screw 550 Tempo indicator plate 551 Wire tempo tracer 553 Rocker for tempo indicator 554 Link arm for tempo indicator 555 Pointer for tempo indicator 557 "Z"-shape wire for folding treadles 558 Side arms for folding treadles, right and left. 558A Sockets for No. 558 559 Links for connecting folding treadles 580 Long threaded wire for muffler attachment</p>
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CUT THIRTEEN

METAL PARTS USED IN THE 65 NOTE, 88 NOTE AND 65-88 NOTE ACTION

SEE CUT 14

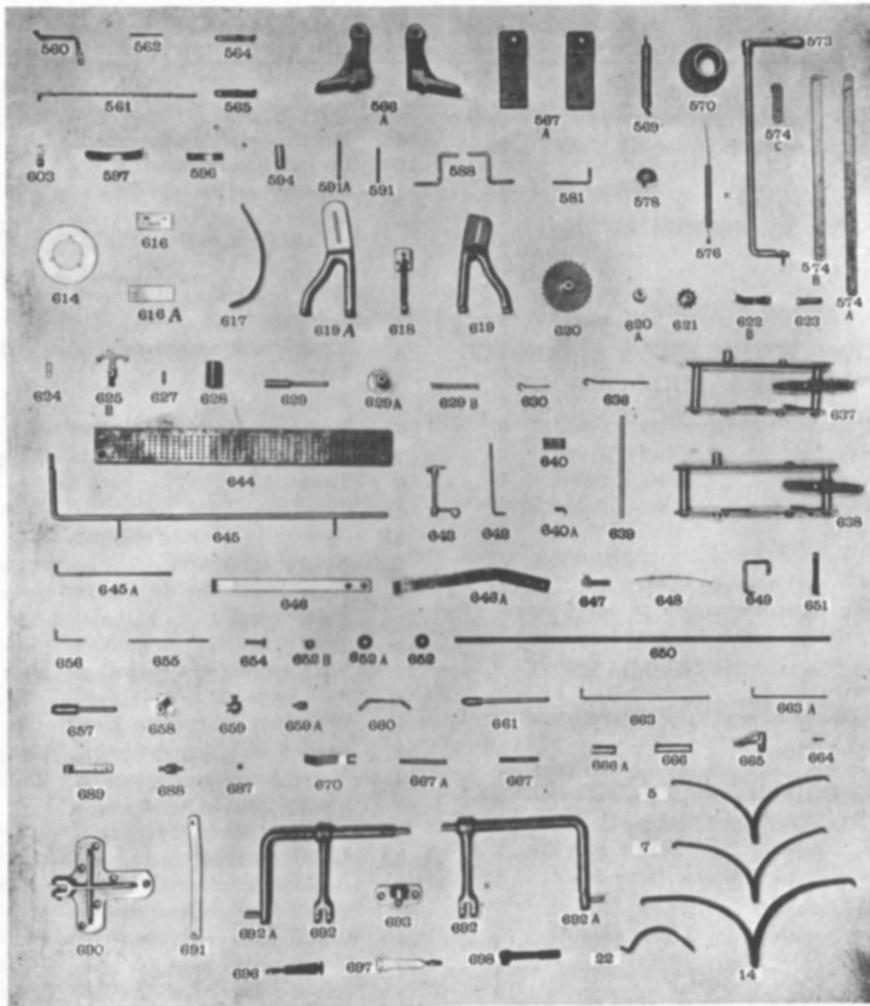
No.		No.	
560	Rocker shaft for soft bellows	640A	Spring for shifting bar
561	Threaded wire for soft bellows	642	Threaded wire for take-up spool
562	Threaded wire for soft bellows	643	Handle for shifting 88 and 65-88
564	Spring for soft bellows wire	644	Shifting bar
565	Spring for motor connection wire	645	Rod for shifting No. 640
566A	Iron brackets to carry bellows	645A	Wire for No. 645
567A	Iron brackets for No. 566A to rest on	646-646A	Metal braces to secure spool box to piano plate
569	Spiral spring for sliding panel door	647	Arm for tracker device adjuster
570	Iron pipe for gate box and wind trunk connections	648	Spring for idler spool
573	Sliding panel lever	649	Wire for tracker device connection
574A	Metal strip for sliding panel lever connections	650	Metal shaft for tracker device
574B	Metal strip for sliding panel lever connections	651	Brass strip to secure No. 644
574C	Guides for sliding panel door	652	Fibre washer for No. 557
576	Spiral spring for muffler rail	652A	Fibre washer for No. 558
578	Rubber stop for treadle bar	652B	Fibre washer for No. 9A
581	Wire to connect center pedal with No. 509A rod	654	Brass valve for shifting device
588	Hook wires for divided rail	655	Brass wire for shifting device
591	1¼-inch soloist button wires	656	Brass wire for shifting device
591A	2-inch soloist button wire	657	Plunger for left-hand music roll socket
594	5/16-inch brass nipple	658	Left-hand music roll socket
596	Spring for motor regulating valve	659	Extension socket for 65-note music
597	Spring for soloist button block	659A	Hub to hold No. 659
603	Metal clip for 534B and 649	660	Iron brace for "L" of sliding panel
614	Metal end for take-up spool	661	Music roll clutch pin for 88-note
616	65-88-note celluloid tablet	663	Threaded wire for shifter
616A	Celluloid tablet for No. 659	663A	Wire for No. 649
617	Steel spring for governor	664	Tapered pin for No. 645
619	Iron standard for motor	665	Arm to hold cam No. 625
619A	Iron standard for motor	666	Escutcheon for lever handles
618	Iron arm for motor crank	666A	Escutcheon for lever handles
620	Large sprocket for reroll	667	Shaft for No. 665
620A	Hub for reroll sprocket	667A	Shaft for No. 665
621	Small sprocket for reroll	670	Spring for No. 9A
622B	Spring for motor governor valve	687	Wire cloth disc for wind ways in action board
623	Spring to release No. 22 spring	688	Brass couplings for shifting device
624	Brass clip for motor wires	689	Metal strip for striking pneumatic
625B	Cam for shifting device	690	Rear bracket for new pedal attachment
627	Brass nipple for shifting bar No. 644	691	Link connection for new pedal attachment bracket
628	Brass nipple ¼ inch for motor connection	692	Arm connection No. 691
629	Left-hand music roll plunger for 65-note	692A	Rod connection No. 692 right and left
629A	Left-hand music roll socket for 65-note	693	Bearing for No. 692A
629B	Spiral spring for Nos. 629A and 657	696	Short metal handles 2½ inches
630	Brass threaded wire for governor	697	Long handles 3 inches
636	Threaded wire for motor valves	698	Casting to adjust retard connection wire
637	Metal frame for gear wheels, 88-note	5	Pound spring for soft bellows
638	Metal frame for gear wheels, 65-88-note	7	Pound spring for feeder pumps
639	Shaft for take-up spool	14	Pound spring for reservoir
640	Shutter for shifting bar	22	Gauge spring for piano pedals

PRACTICAL GUIDE

For the

REGULATING OF
PLAYER-PIANO
MECHANISM





CUT FOURTEEN

NAMES AND NUMBERS OF PARTS

EXPRESSION LEVERS AND SOLOIST BUTTONS

No.	CUT 2
1	Loud pedal lever
2	Soft pedal lever
3	Tempo pedal lever
4	Reroll pedal lever
5	Soloist buttons
6	Tempo Modulator (retard and accelerando lever)

FRONT VIEW OF ACTION WITH GROOVE AND POUCH BOARD REMOVED SHOWING FULL VIEW OF VALVES, ALSO PRIMARY ACTION

No.	CUT 3
1	Primary action
2	Primary valve buttons
3	Primary pouch board
4	Primary valve board
5	Secondary action box or vacuum chamber
6	Air passage—leading from the action to the bellows
7	Air passage from primary action to secondary
8	Metal valve cups
9	Guide block for valve stems
10	Valve stem and valves with wooden button on end
14	Flanges for strikers

REAR VIEW SHOWING POWER PNEUMATICS, FLEXIBLE STRIKERS AND REGULATING RAIL

No.	CUT 4
1	Lead tubing
2	Lead tubing, channel board
3	Regulating rail
4	Regulating screws
5	Flexible fingers
6	Capstan screws for regulating fingers
8	Pneumatic wires

10	Wire support for regulating rail
11	Power or striking pneumatics
12	Pneumatic shelves
13	Primary action

BELLOWS AND BELLOWS CONNECTIONS

No.	CUT 5
1	Loud or damper lever rod
2	Soft lever rod
3	Retard and accelerando lever rod
4	Tempo lever rod
5	Reroll lever rod
6	Rod to operate key locking rail
7	Rod and handle to operate sliding door
8	Tube connection for bass soloist
8A	Tube connection for treble soloist
8B	Springs to operate soloists
9	Retard lever arm
10	Wire connection to damper rod
11	Wind trunk
12	Tube connection to bellows
13	Wire connections to soft pressure bellows or regulator
14	Soft pressure bellows cap
15	Rockshaft to operate reroll
16	Retard wire connection
17	Motor governor pneumatic
18	Spring for the same
19	Motor tube conveyance
19A	Motor governor cap
20	Rocking lever operating tempo valve
21	Reroll wire connection
22	Reroll valve wire connection
23	Tempo valve wire
24	Reroll valve wire
25	Bracket connecting treadle arm to bellows
26	Treadles

PRACTICAL GUIDE

For the

**REGULATING OF
PLAYER-PIANO
MECHANISM**



NAMES AND NUMBERS OF PARTS

27	Metal treadle frames
28	Treadle link
29	Treadle hinge
30	Treadle Arm
31	Treadle bar
32	Treadle support
33	Soloist tube conveyance
34	Soft pressure bellows or regulator
35	Main reservoir
36	Main reservoir cap
37	Screw to hold wind chest
38	" " " " "

REAR VIEW SHOWING COMBINATION TRACKER BAR, AND MUSIC ROLL SHIFTER PNEUMATICS

No.	CUT 6
1	Combination 65-88-Note bar
2	Sliding shutters
3	Wooden guide bar for sliding shutters
4	Brass guide strip
5	Rocking shaft for moving guide strip and shutters
6	Rock shaft wire
7	Crank for operating No. 6 rock shaft wire
8	Automatic music roll adjuster
9	Rubber tubes leading from shifting pneumatic to tracker bar
10	Metal telescoping couplings with brass dust sieves
11	Bell crank wire to shifter pneumatic
12	Tracer wire to shifter wire
13	Hub and arm for shifter wire
14	Shaft leading to cam for tracking device
15	Support for shaft
16	Support for shaft
17	Hub and arm leading to cam wire of shifter

18	Sprocket wheel and chain for music spool socket
19	Cam for shifting device
20	Shaft for music spool socket

CROSS SECTION OF SHIFTER PNEUMATIC

No.	CUT 7
1	Shifter pneumatic
2	Connecting arms to pneumatics
3	Exhaust Tube (nipple)
4	Valve
5	Pouch pneumatic
6	Brass tube for No. 6A rubber tube
7	Brass tube for No. 7A rubber tube
8	Pouch button
9	Upper pouch
10	Lower pouch
11	Vent hole
12	Wind way or channel

THREE-QUARTER FRONT VIEW NEW MODEL SHIFTER PNEUMATIC

No.	CUT 8
1	Shifter pneumatic
2	Connecting arms to pneumatics
3	Exhaust tube or nipple
4	Front cover
5	Valve cover with felt top
6A)	
6B)	
7A)	Rubber tube tracker connections
7B)	
8	Connecting arm block
9	Supporting blocks

NAMES AND NUMBERS OF PARTS

CROSS SECTION OF SOFT BELLOWS

No.	CUT 9
1	Hinge valve
2	Valve spring
3	Bellows cover
4	Operating Rocker Shaft
5	Stop block to valve No. 1
6	Adjustable stop
7	Inlet wind way
8	Exhaust wind way

CROSS SECTION OF SOLOIST PNEUMATIC

No.	CUT 10
1	Pneumatic
2	Wind way
3	Exhaust Tube Nipple
4	Pouch Pneumatic
5	Valves
6	Valve stem guide
7	Valve cover with felt top
8	Valve button
9	Stem
10	Connecting arm
11	Adjusting screw

AUTOMATIC MUSIC ROLL ADJUSTER

No.	CUT 11
1	Valve box
1A	Primary valves
2	Power pneumatics
3	Link connecting the two pneumatics
4	Valve box base
5	Tube connections
6	Connection link to rocking shaft
7	Rocking shaft
7A	Rocking shaft support
8	Wire tracer to crank No. 9
9	Crank fastened to main shaft

10	Support for the same
11	Music roll socket
12	Arm which operates the 65-88 shifter
13	Wire tracer for the same
14	Crank arm for the same
15	Metal telescoping cups containing a wire gauze or sieve to prevent dust entering into adjuster box
16	Side of spool box

MOTOR

No.	CUT 12
1	Sliding valve
2	Valve guide
3	Wire connection from motor shaft to valve
4	Bracket and journal which carries the shaft
5	Motor shaft
6	Sprocket wheel hub and set screw
7	Sprocket wheel
8	Music roll adjuster cam
9	Set screw for same
10	Arm which moves the cam
11	Brake, operative while playing but inoperative while re-rolling.
12	Brake wheel
13	Idler spool
14	Reroll sprocket chain
15	Large sprocket wheel
16	Small sprocket wheel
17	Motor chain
18	Sprocket driven by motor
19	Wire operating reroll clutch
20	Reroll brake wire
21	Brake arm, operative only at rerolling
22	Clutch shifter arm
23	Clutch collar
24	Spring, operating brake No. 11
25	Motor support

PRACTICAL HINTS TO REPAIR MEN

SQUEAKS

Put a drop of oil on all pedal bearings, wherever two or more metal parts connect. Should there be a *click* when pressing the treadles down the trouble is in the seven pound spring in back of the pumps (or bellows).

To remedy same, take out spring and put a little grease between the two parts where they are riveted together also on the two pointed ends where spring goes into the pump (bellows) and spring block. The pump or bellows spring should be set in place so that the top of the spring does not touch either the pump—or piano strings when pump is open. If the spring still squeaks work your hand back of the pump and take hold of the spring at the top and work it back and forth thereby easing the holes where the points of the spring enters the wood.

Sometimes the iron castings on back of pumps to which the pedal links are fastened become loose from constant strain while playing. Tighten all the screws in the casting so as to avoid a squeak.

To avoid a squeak, grease or black lead the face of the wooden spring on top of reservoir or large bellows cut 5 No. 35

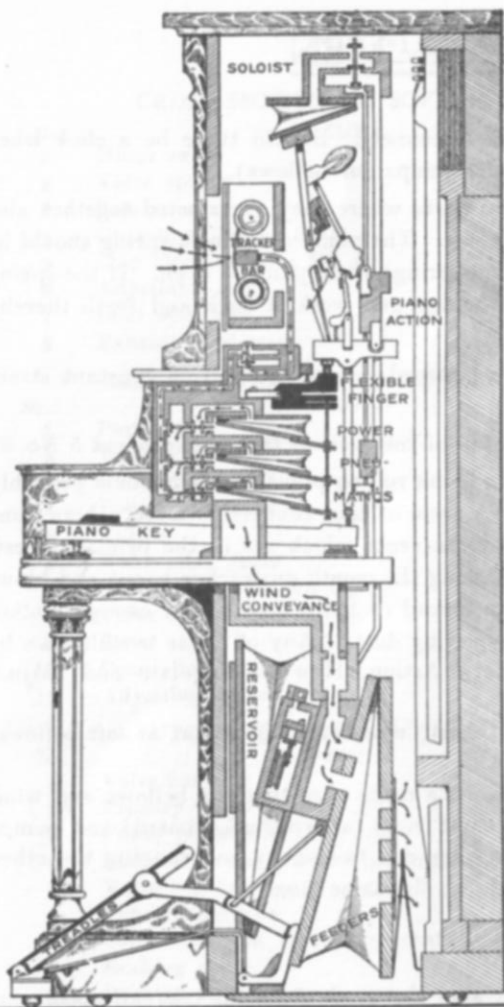
If a note should play as soon as treadles are worked, even though there is a blank roll on player, the trouble is probably that there is dirt under either the primary or secondary valves, or there must be a seam or tube connection loose, where same are screwed together. If a note does not play the first thing to do is to look at the vents which are in the primary chest. See cut 3, by taking off the L board in front, same can be seen and blown out by placing the mouth on tracker board and blowing real hard. The trouble may also be that the secondary valve has stripped its thread or there may be not enough motion in the secondary valve, or a pouch has a hole in it, or a tube or channel is stopped by dust. Any of these troubles can be righted by ordinary means. Read instructions on Page 4, Primary and Secondary Action, How to Regulate and Adjust Same.

Tighten all screws in bellows; those that hold the pumps or feeders to chest, reservoir, expression of soft bellows, valve or gate box, and governor.

See that wind trunk is screwed tight against bottom part of key bottom. To make sure that the bellows and wind trunk are tight take out top player action, place a piece of leather over hole in wind trunk (above the keyboard) and pump; if there is a leak at all, same can be detected by using a small rubber tube, holding one end to the ear and running the other end along the part of bellows where same are screwed together, pumping treadle at the same time.

SPOOL OR MUSIC ROLL BOX--WHERE TO OIL

Both music sockets No. 12 and the brackets which hold the take up spool, also the gear wheel on take up spool and small pinion wheel which connects with same. Brake No. 21 (cut 12) on reroll shaft, bearings for reroll and pinion shaft, in fact every point where there are metal bearings.



Sectional view of the **AUTO PNEUMATIC ACTION**, showing complete instrument and double primary and power pneumatics and "Soloist" devices. Also bellows and folding pedals.

The arrows show the air-currents as they are drawn into the instrument and finally exhausted through the valve on back of main bellows.

The Following Measurements are Standard for the Speed of Music Roll:

When the Indicator Pointer is at 10 the paper should travel about one foot in a minute and increase a foot with every ten numbers which will bring it to seven feet at seventy and thirteen feet at one hundred and thirty. A slight variation from these figures may be set right by weakening or strengthening the governor spring No. 18, Cut Five, but a better way is to enlarge opening in tempo valve if too slow, or reduce the opening in valve by glueing a thin piece of leather along the edge if too fast.

N. B.—This is the first time in the history of the Player Piano Mechanism Industry that an elaborate book of this kind has ever been published and it should be understood that no player piano will ever need all the adjusting and regulation described in the previous pages at one time, but we believe in being broad in all matters and have endeavored to enlighten Repair Men as well as Music Dealers on the entire construction of a player piano and we hope our friends will profit by our efforts.