J. WIESER.

DRUM AND CYMBAL ATTACHMENT FOR AUTOPNEUMATIC PIANOS.

APPLICATION FILED MAR. 12, 1909.

939,213.

Patented Aug. 24, 1909.

3 SHEETS—SHEET 1.

Fig. 1.

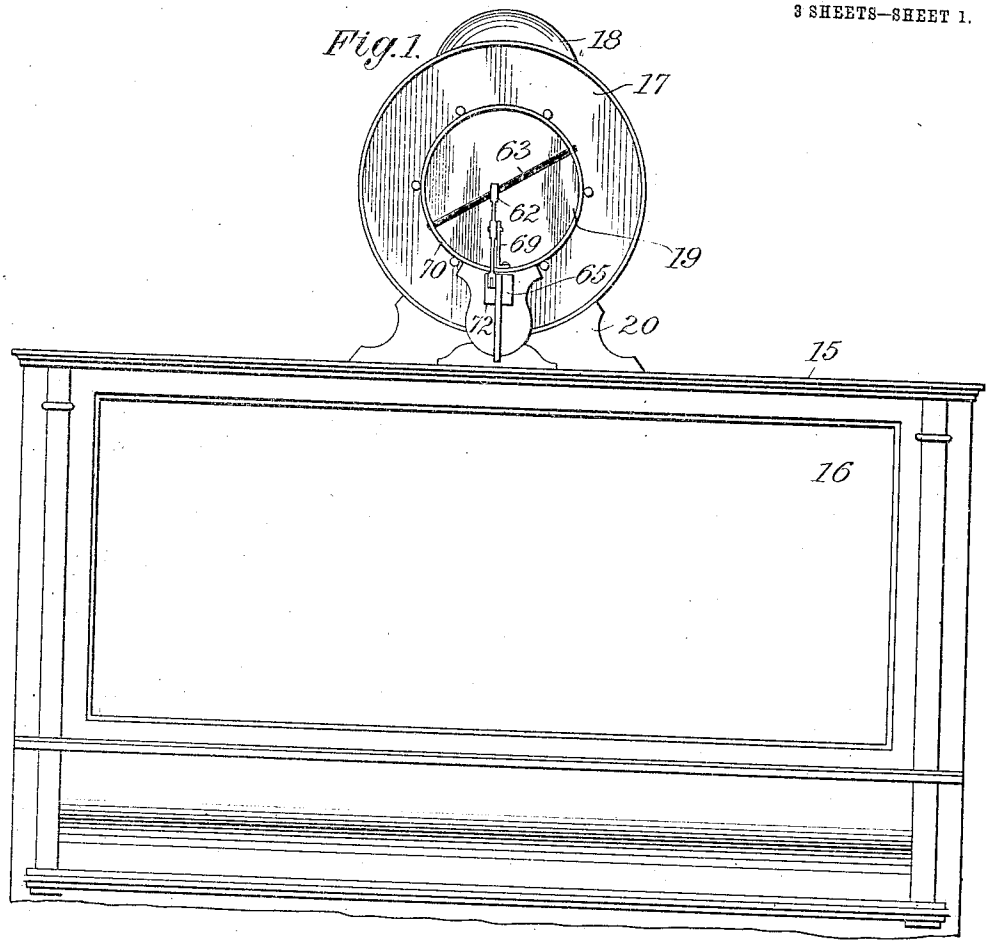


Fig. 9.

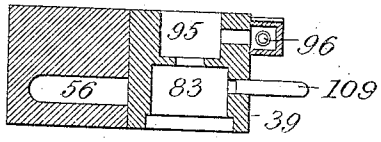


Fig. 11.

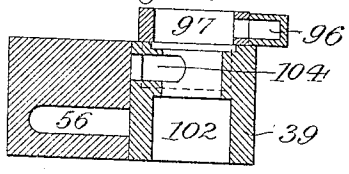


Fig. 10.

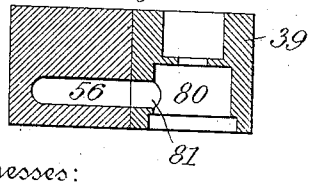
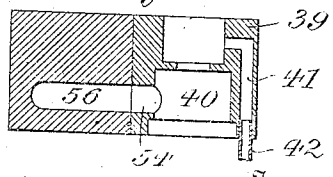


Fig. 12.



Witnesses:
Arthur E. Gumpr.
H. R. Schulz.

Inventor
Joseph Wieser
By his Attorney
Louis W. Briesen

J. WIESER.

DRUM AND CYMBAL ATTACHMENT FOR AUTOPNEUMATIC PIANOS.

APPLICATION FILED MAR. 12, 1909.

932,213.

Patented Aug. 24, 1909.

3 SHEETS—SHEET 2.

Fig. 2.

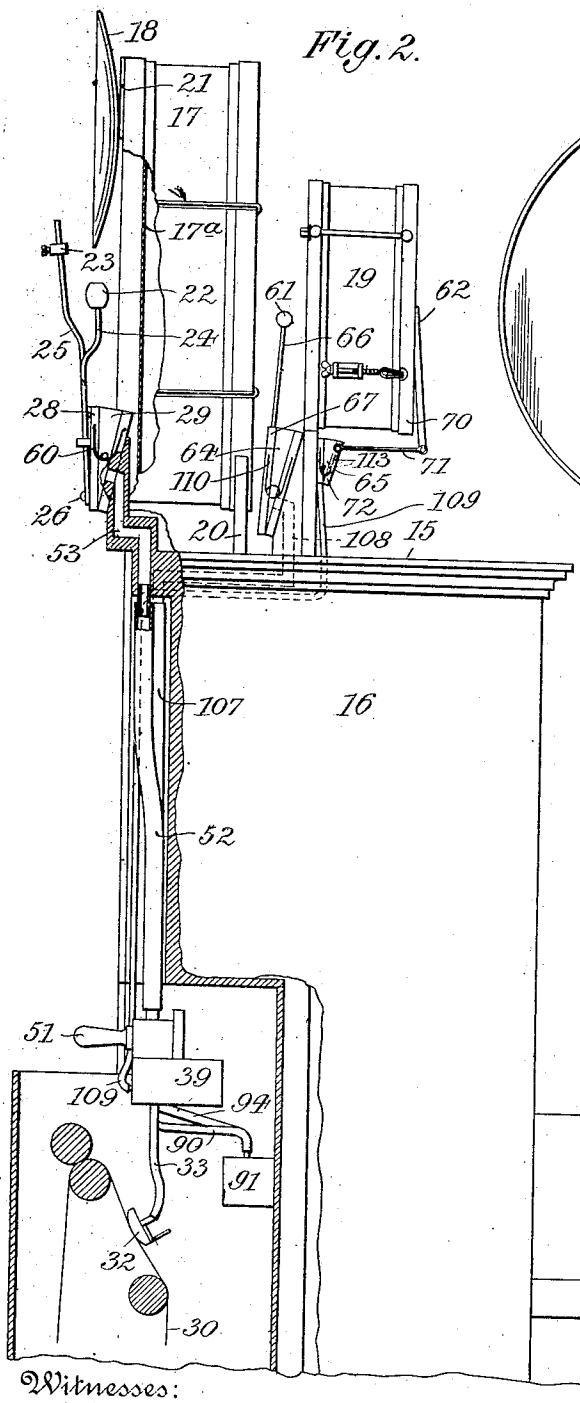


Fig. 3.

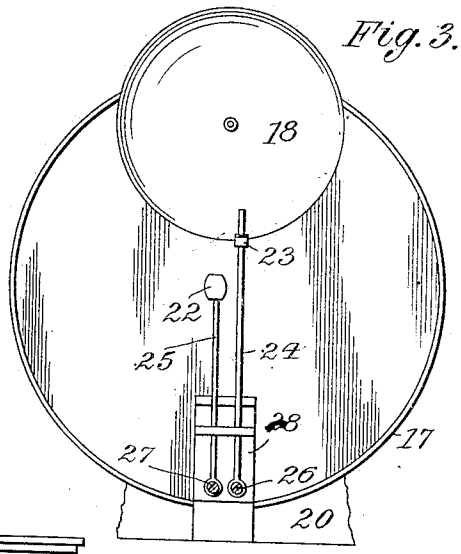


Fig. 4.

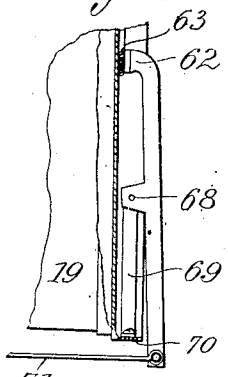
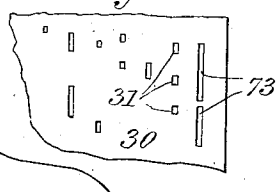


Fig. 13.



Witnesses:
Arthur E. Jumps.
H. R. Schulz.

Inventor
Joseph Wieser
By his Attorney
Frank P. Briesen

J. WIESER.

DRUM AND CYMBAL ATTACHMENT FOR AUTOPNEUMATIC PIANOS.

APPLICATION FILED MAR. 12, 1909.

932,213.

Patented Aug. 24, 1909.

3 SHEETS—SHEET 3.

Fig. 5.

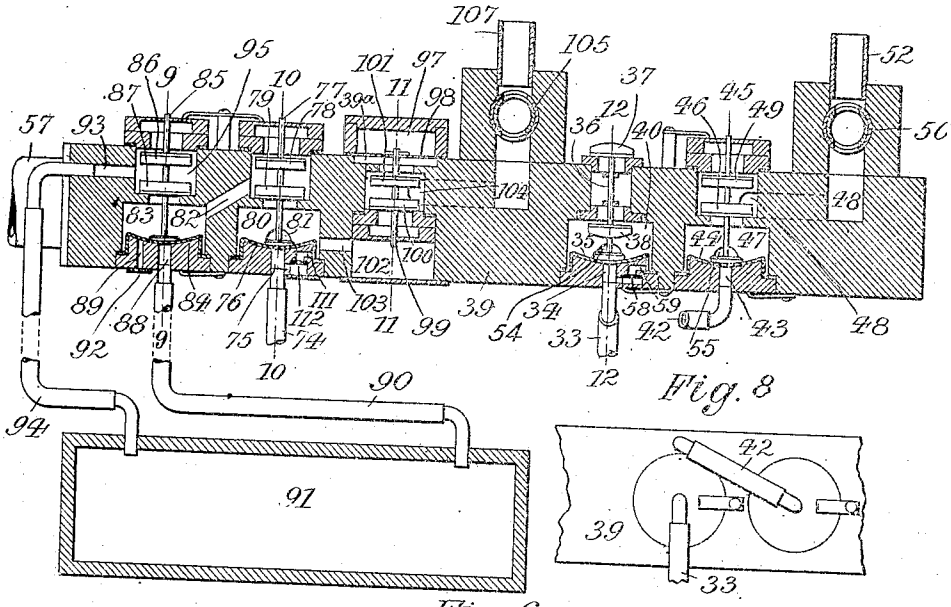


Fig. 8

Fig. 6.

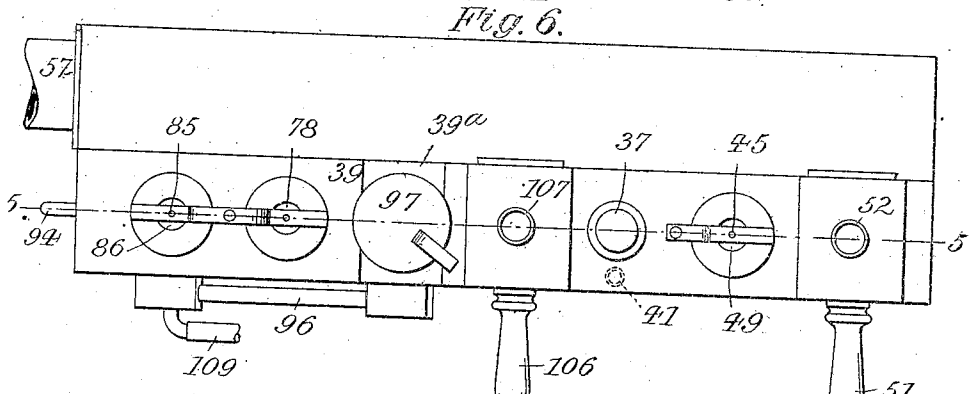
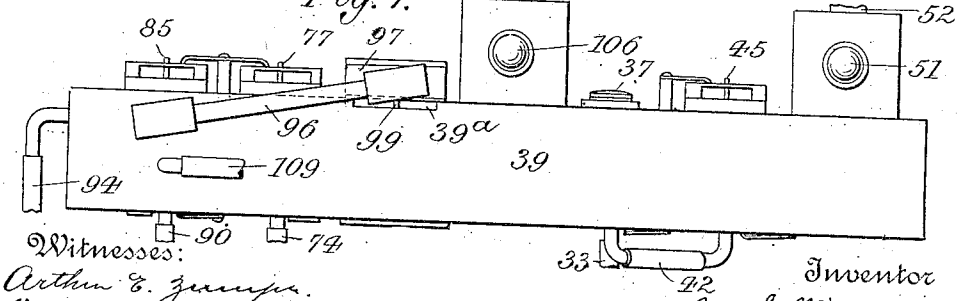


Fig. 7.



Witnesses:

Arthur E. Zumpe.

H. R. Schulz.

Inventor

Joseph Wieser

By his Attorney

Frank O. Brieser

UNITED STATES PATENT OFFICE.

JOSEPH WIESER, OF ST. JOHNSVILLE, NEW YORK, ASSIGNOR TO F. ENGELHARDT & SONS, OF ST. JOHNSVILLE, NEW YORK, A FIRM.

DRUM AND CYMBAL ATTACHMENT FOR AUTOPNEUMATIC PIANOS.

932,213. Specification of Letters Patent. Patented Aug. 24, 1909.

Application filed March 12, 1909. Serial No. 482,881.

To all whom it may concern:

Be it known that I, JOSEPH WIESER, a citizen of the United States, residing at St. Johnsville, Montgomery county, State of New York, have invented new and useful Improvements in Drum and Cymbal Attachments for Autopneumatic Pianos, of which the following is a specification.

This invention relates to a drum and cymbal attachment for autopneumatic pianos adapted to accompany or emphasize the tune played on the latter.

The attachment comprises a bass drum, a side drum, and a cymbal, the beaters of which are pneumatically actuated by the same perforated music sheet which actuates the hammers of the piano.

The invention is well adapted to be applied to pianos which are played in comparatively large halls and other places of amusement.

In the accompanying drawings: Figure 1 is a front view of the upper part of a piano embodying my invention; Fig. 2 a side view, partly in section, of Fig. 1, drawn on an enlarged scale; Fig. 3 a rear view of the bass drum and cymbal; Fig. 4 a detail of the snare damper and adjoining parts; Fig. 5 a longitudinal vertical section on line 5—5, Fig. 6, showing the vacuum reducing chamber; Fig. 6 a top view of the valve block; Fig. 7 a rear view thereof; Fig. 8 a bottom view of part of the block, showing the primary and secondary valves for the bass drum; Figs. 9, 10, 11 and 12 are cross sections through the valve block on lines 9—9, 10—10, 11—11 and 12—12, respectively, Fig. 5, and Fig. 13 illustrates part of a tune sheet.

To the top plate 15 of an autopneumatic piano 16 are secured a bass drum 17, a cymbal 18 and a side drum 19. Bass drum 17 rests upon a suitable support 20 carried by top plate 15, while cymbal 18 is attached to drum 17 by a bracket 21. Drum 17 and cymbal 18 are adapted to be simultaneously played by a pair of beaters 22, 23, respectively. The shanks 24, 25 of beaters 22, 23 are, by screws 26, 27, secured to the movable board 28 of a pneumatic or bellows 29 which is mounted on top plate 15 back of bass drum 17. When the air is withdrawn from bellows 29, the latter will collapse, so that beater 22 will strike drum-head 17ª, while beater 23 will simultaneously engage the rim of cymbal 18, to sound the latter.

In order to operate bellows 29, the usual tune sheet 30 for actuating the piano hammers is provided with a first additional row of perforations 31, which, in uncovering a corresponding port of duct-bridge 32, admit air into a tube 33. This tube is connected to a duct 34 formed below a diaphragm 35 of a primary valve action which is composed of a stem 36, an upper valve disk 37 and a lower valve disk 38, stem 36 being supported upon diaphragm 35. Stem 36 is mounted within a valve block 39 secured at any convenient point to the piano frame. Valve disk 38 plays within a vacuum chamber 40 and controls communication between said chamber and a duct 41, while disk 37 controls communication between said duct and the atmosphere. Duct 41 is, by tube 42, connected to a passage 43 formed below the diaphragm 44 of a secondary valve action arranged within block 39. The secondary valve action comprises a stem 45 resting upon diaphragm 44, a lower valve disk 46 controlling communication between a vacuum chamber 47 and a duct 48, and an upper valve disk 49 controlling communication between said duct and the atmosphere. Duct 48 is elbow-shaped and is controlled by a rotary valve 50 having handle 51. Valve 50 is, by tube 52 and passage 53, connected with bellows 29. From vacuum chambers 40, 47 air is constantly withdrawn through ducts 54, 55, respectively, which communicate by a longitudinal channel 56 formed in block 39 and by tube 57, with the main exhaust bellows of the instrument, (not shown).

It will be seen that when a perforation 31 of tune sheet 30 uncovers the corresponding port in duct-bridge 32, air will be admitted through tube 33 to duct 34. As the air is constantly withdrawn from vacuum chamber 40 through duct 54, channel 56 and tube 57, the opening of duct 34 will cause diaphragm 35 to ascend, thereby closing valve 38 and opening valve 37. Air will thus be admitted through duct 41, tube 42 and passage 43, below diaphragm 44. The air being constantly withdrawn from chamber 47 through duct 55, diaphragm 44 will ascend to close valve 49 and open valve 46. In this way bellows

29 will be connected with vacuum chamber 47 through tube 52, open valve 50 and duct 48, so that the air is withdrawn from said bellows to cause its collapse and effect a corresponding throw of beaters 22, 23 against bass drum 17 and cymbal 18, respectively.

When an imperforate section of tune sheet 30 arrives opposite the duct-bridge-port which controls bellows 29, the air is withdrawn from duct 34 through a bleed hole 58 and an angular passage 59, to cause a descent of the primary valve. Valve 37 will thus be closed, while valve 38 is opened to connect vacuum chamber 40 with duct 43. In this way diaphragm 44 will descend to close valve 46 and open valve 49. Air will thus be admitted through open valve 49, duct 48, open valve 50, tube 52 and passage 53, into bellows 29, so that the latter will be expanded by spring 60.

By properly adjusting valve 50, the vacuum within pneumatic 29, and consequently the force of the stroke of beaters 22, 23 may be adjusted, so as to correspondingly regulate the loudness of the drum and cymbal accompaniment. By closing valve 50, the instrument may be played without sounding either bass drum or cymbal.

The means for operating the side drum 19 consist of a beater 61 to which a vibratory motion is imparted, while simultaneously a damper 62 is lifted off the drum-snare 63. Beater 61 and damper 62 are actuated by separate pneumatics or bellows 64, 65, both bellows, however, being operated from one and the same perforation of tune sheet 30, as will hereinafter be more fully described. The stem 66 of beater 61 is rigidly connected to the movable board 67 of bellows 64. Snare damper 62 is pivoted at 68 to a standard 69 projecting upwardly from the front rim 70 of drum 19. The lower end of damper 62 is, by link or wire 71, connected to the movable board 72 of bellows 65.

In order to impart the desired vibratory motion to beater 61, and to simultaneously tilt damper 62, the following construction has been devised: Tune sheet 30, hereinabove referred to, is provided with a second additional row of perforations 73, which, in uncovering a corresponding port of duct-bridge 32, admit air into a tube 74. The latter is in communication with a duct 75 formed below a diaphragm 76 of a primary valve action which comprises a stem 77, an upper valve disk 78 and a lower valve disk 79, stem 77 resting upon diaphragm 76. Valve disk 79 plays above a vacuum chamber 80 formed in block 39 and connected through passage 81 with channel 56. Valve disk 79 controls communication between chamber 80 and a duct 82, while disk 78 controls communication between said duct and the atmosphere. Duct 82 opens into a fluctuating vacuum chamber 83 also formed in block 39 and containing a diaphragm 84 upon which there is supported a secondary valve action comprising a stem 85, an upper disk 86 and a lower disk 87. Below diaphragm 84 there are formed two passages 88, 89, of which passage 88 communicates, by a tube 90, with a vacuum reducing box or chamber 91, while passage 89 is, through bleed hole 92, in permanent connection with the atmosphere. Disk 87 of the secondary valve action controls communication between chamber 83 and a passage 93, while disk 86 controls communication between said passage and the atmosphere. Passage 93 is, by tube 94, connected to chamber 91, tubes 90 and 94 entering said chamber preferably near opposite ends thereof, as shown in Fig. 5.

Valve disks 86, 87 play within a corresponding recess 95 formed in block 39, said recess being connected by a passage 96 to a chamber 97 formed above a diaphragm 98. From the latter is suspended a tertiary valve action consisting of a spindle 99, a lower valve disk 100, and an upper valve disk 101. Below valve disk 100, there is formed a vacuum chamber 102 which is, by duct 103, connected to vacuum chamber 80. Valve disk 100 controls communication between chamber 102 and an elbow duct 104, while valve disk 101 controls communication between said duct and the atmosphere, said latter communication being effected through groove 39^a extending across block 39 below diaphragm 98. Duct 104 is in turn controllable by a rotary valve 105, carrying handle 106. Valve 105 is, by tube 107 and duct 108, connected with bellows 64. From the fluctuating vacuum chamber 83 there leads a tube 109 to bellows 65, so that the latter will collapse as soon as a vacuum has been established within chamber 83 to operate damper 62.

Whenever one of the perforations 73 of tune sheet 30 uncovers the corresponding port in duct-bridge 32, air will be admitted through tube 74 to passage 75. As the air is constantly withdrawn from chamber 80 through duct 81, the admission of air to passage 75 will cause diaphragm 76 to ascend, thereby closing valve 78 and opening valve 79. In this way chamber 83 will be instantly evacuated, the air being exhausted through duct 82. As diaphragm 84 is connected at its lower side with the atmosphere through bleed hole 92, as well as through port 88, tube 90, chamber 91, tube 94, duct 93 and an atmospheric port of chamber 95, the evacuation of chamber 83 will cause an ascent of the diaphragm to close valve 86 and open valve 87. By opening valve 87, chamber 83 becomes suddenly connected with the comparatively large chamber 91 containing atmospheric air, so that the vacuum within chamber 83 will immediately decrease, while

simultaneously the same reduced vacuum will be established below diaphragm 84. The latter will thus descend to close valve 87 and open valve 86, thereby admitting atmospheric air into recess 95 and into chamber 91 through duct 93 and tube 94. As the above described action is but momentary, the constant exhaust through 82 and 80 to 81, will not appreciably affect the reduced tension in 83 and 88. The closing, however, of valve 87 will cause the reëstablishment of a high vacuum within chamber 83, to effect an immediate rising of diaphragm 84 and consequently a repetition of the operation described. It will thus be seen that as long as the duct-bridge-port coöperating with openings 73 of tune sheet 30 remains uncovered, vacuum and atmospheric pressure will alternate in rapid succession within recess 95. These rapid changes from vacuum to atmospheric pressure, and vice versa, within recess 95, are utilized for imparting quick vibrations to beater 61, in order to produce the desired tattoo. For this purpose, recess 95 is, by duct 96, connected to chamber 97, to effect corresponding quick vibrations of diaphragm 98, owing to the change of pressure in recess 95. A rise of diaphragm 98 will close valve 101 and open valve 100 to permit the withdrawal of air from bellows 64, the air escaping through duct 108, tube 107, open valve 105, elbow duct 104, under open valve 100 and duct 103. Bellows 64 will thus collapse to bring beater 61 into engagement with the batter head of side drum 19. The immediately following descent of diaphragm 98 will close valve 100 and open valve 101, to admit atmospheric air into bellows 64, so that the latter will be expanded by spring 110 to withdraw beater 61 from the batter head. Beater 61 will then again be thrown against said head and subsequently withdrawn therefrom, which operation will be repeated as long as a perforation 73 leaves uncovered the coöperating port of tracker bar 32. In this way the desired rapid vibration of beater 61 is obtained, so that an effect is produced which is similar to that obtained when playing the drum with hand sticks. During the vibrations of beater 61, damper 62 is raised off snare 63, in the following manner: Chamber 83 is exhausted, while beater 61 is operated, as will be readily understood from the above description. As this chamber is, by tube 109, permanently connected with the interior of bellows 65, the latter will thus collapse and remain collapsed during the operation of the beater. This is due to the fact that the spring 113 of bellows 65 is of such a tension that even the low vacuum periodically established within chambers 83, 91, during the above described fluctuations, will be sufficient to maintain bellows 65 collapsed. In this way the undampened snare is permitted to freely vibrate on the front head of the drum, whereby the desired sharp and crisp sound is obtained.

When the port of the tracker bar, which was previously opened by perforation 73, is closed by an imperforate portion of tune sheet 30, diaphragm 76 will descend owing to the withdrawal of the air beneath the same, such withdrawal being effected through angular channel 111 and bleed hole 112. The descent of diaphragm 76 will close valve 79 and open valve 78. Air will thus be admitted through duct 82 into chamber 83 to cause the simultaneous descent of diaphragm 84. In this way valve 87 will be closed, while valve 86 is opened to admit air into recess 95, and consequently through duct 96 into chamber 97. Diaphragm 98 will thus descend to admit air through opened valve 101 into bellows 64, which will be expanded by spring 110.

When air is admitted to chamber 83, in the manner described, air will also enter bellows 65 through tube 109, to permit spring 113 to expand said bellows. Damper 62 will thus be forced against snare 63, to deaden the sound of the drum, after beater 61 has come to rest.

By properly adjusting valve 105, the force of the stroke of beater 61 may be regulated, to render the drum accompaniment more or less impressive, or to cause it to be entirely silenced.

It will be seen that by the means described a pleasant accompaniment of the autopneumatic piano is obtained. As by the use of bass drum, side drum and cymbal, the time of the music played on the instrument may be emphasized, the device is particularly adapted for use in ball rooms, skating rinks and similar large places of entertainment.

I claim:

1. A musical instrument comprising a tune sheet, a side drum, a beater, a primary valve controlled by the tune sheet, a secondary valve, a fluctuating vacuum chamber, a diaphragm within said chamber and controlling the secondary valve, a vacuum reducing chamber, a duct formed below the diaphragm, means for permanently connecting said reducing chamber with said duct, means controlled by the secondary valve for connecting the reducing chamber alternately with the fluctuating vacuum chamber and the atmosphere, a tertiary valve controlled by the secondary valve, and a bellows controlled by the tertiary valve and adapted to operate the beater.

2. A musical instrument comprising a tune sheet, a side drum, a beater, a primary valve controlled by the tune sheet and having a pair of valve disks, a fluctuating vacuum chamber, means controlled by said disks for connecting said chamber either with a vacuum or with the atmosphere, a diaphragm

within said fluctuating vacuum chamber, a secondary valve having a pair of valve disks and controlled by the diaphragm, a vacuum reducing chamber, a duct formed below the diaphragm, means for connecting said reducing chamber with said duct, means controlled by the secondary valve disks for alternately connecting the reducing chamber with the fluctuating vacuum chamber and the atmosphere, a tertiary valve controlled by the secondary valve, and a bellows controlled by the tertiary valve and adapted to operate the beater.

3. A musical instrument comprising a tune sheet, a side drum, a beater, a snare damper, a primary valve controlled by the tune sheet and having a pair of valve disks, a fluctuating vacuum chamber, means controlled by said disks for connecting said chamber either with a vacuum or with the atmosphere, a diaphragm forming the bottom of said chamber, a secondary valve having a pair of disks and controlled by the diaphragm, a duct formed below the diaphragm, a vacuum reducing chamber, means for connecting said reducing chamber with said duct, means controlled by said secondary valve disks for alternately connecting the reducing chamber with the fluctuating vacuum chamber and the atmosphere, a tertiary valve controlled by the secondary valve, a first bellows having a movable board that carries the beater, means controlled by the tertiary valve for connecting said first bellows either with a vacuum or the atmosphere, a second bellows communicating with the fluctuating vacuum chamber, and means for operatively connecting the second bellows with the snare damper.

4. A musical instrument comprising a tune sheet, a side drum, a beater, a snare damper, a valve block, a recess formed in said block, a primary valve mounted in said block and controlled by the tune sheet, a fluctuating vacuum chamber, means controlled by said primary valve for connecting said fluctuating vacuum chamber either with a vacuum or with the atmosphere, a diaphragm forming the bottom of said fluctuating vacuum chamber, a secondary valve controlled by said diaphragm and having a pair of valve disks that are adapted to connect the block recess either with the fluctuating vacuum chamber or with the atmosphere, a vacuum reducing chamber, a duct formed below the diaphragm, means for connecting said reducing chamber with said duct, means for connecting the reducing chamber with the block recess, a tertiary valve having a chamber that communicates with said recess, a first bellows having a movable board that carries the beater, means controlled by the tertiary valve for connecting said first bellows either with a vacuum or with the atmosphere, a second bellows communicating with the fluctuating vacuum chamber, and means for operatively connecting the second bellows with the snare damper.

Signed by me at St. Johnsville, N. Y., this 8th day of March, 1909.

JOSEPH WIESER.

Witnesses:
JOHN D. CAIRNS,
ALFRED D. ENGELHARDT.