T. P. BROWN.

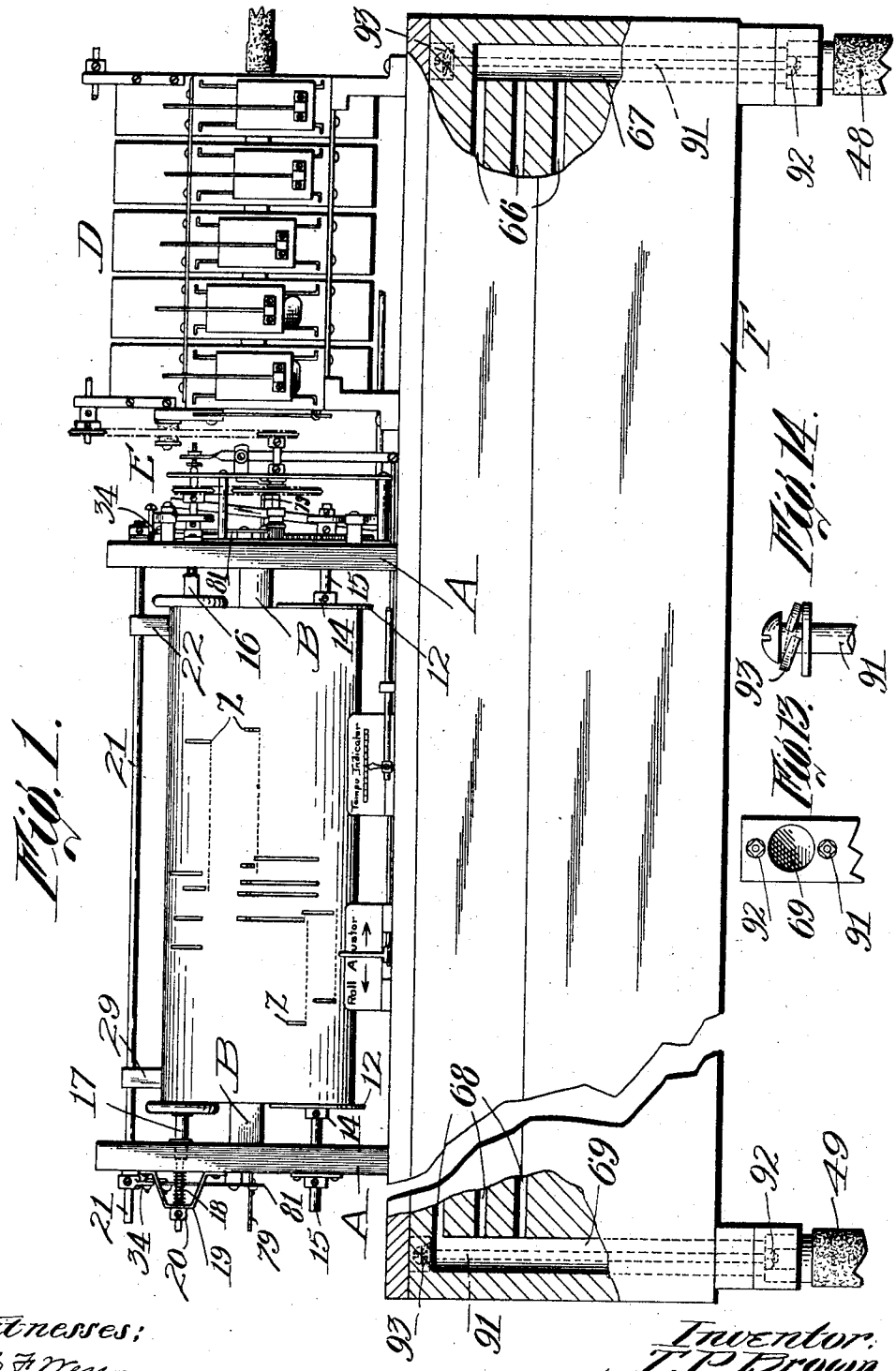
MUSICAL INSTRUMENT.

APPLICATION FILED MAY 13, 1912.

1,179,274.

Patented Apr. 11, 1916.

5 SHEETS—SHEET 1.



Witnesses:
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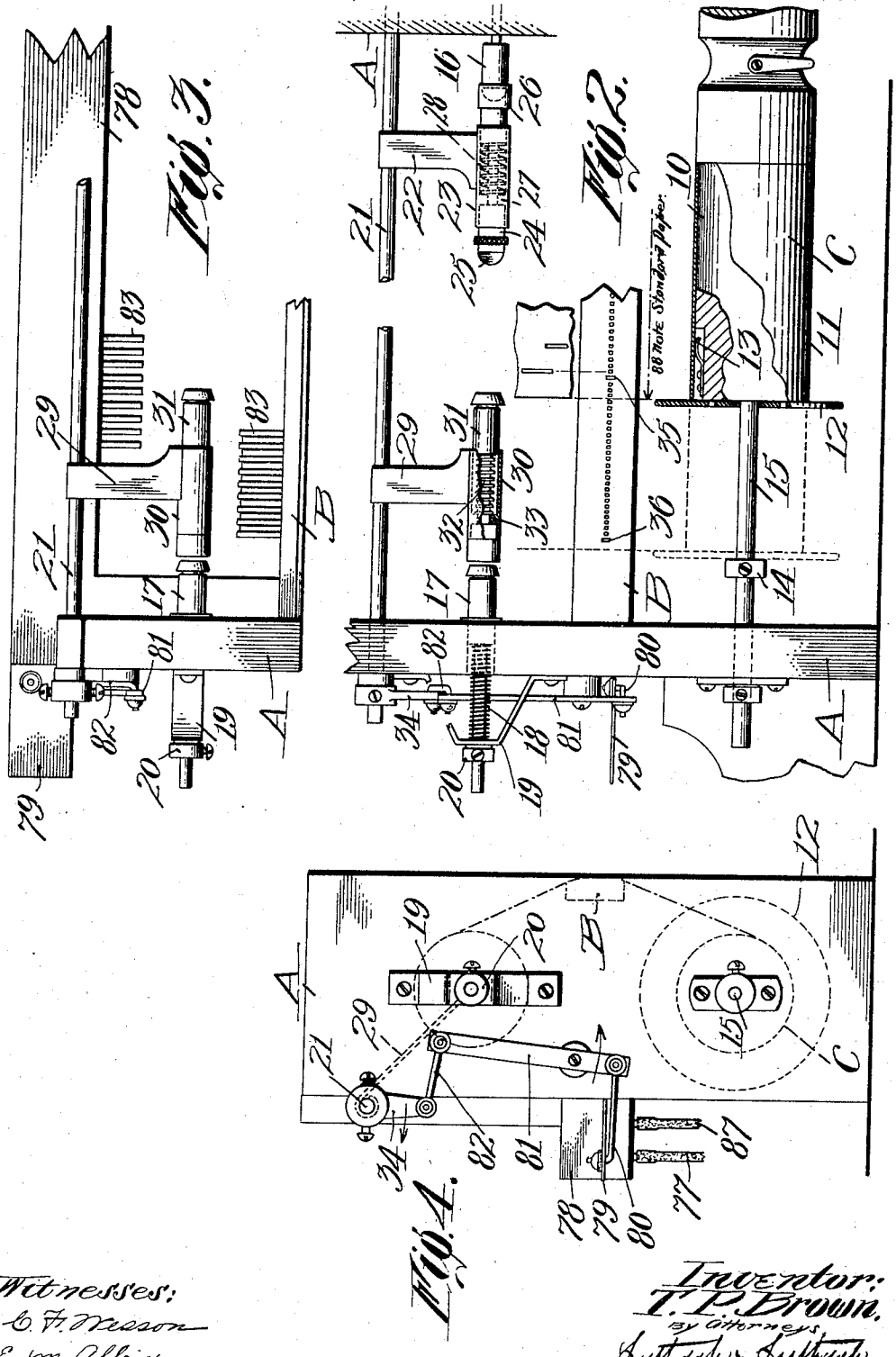

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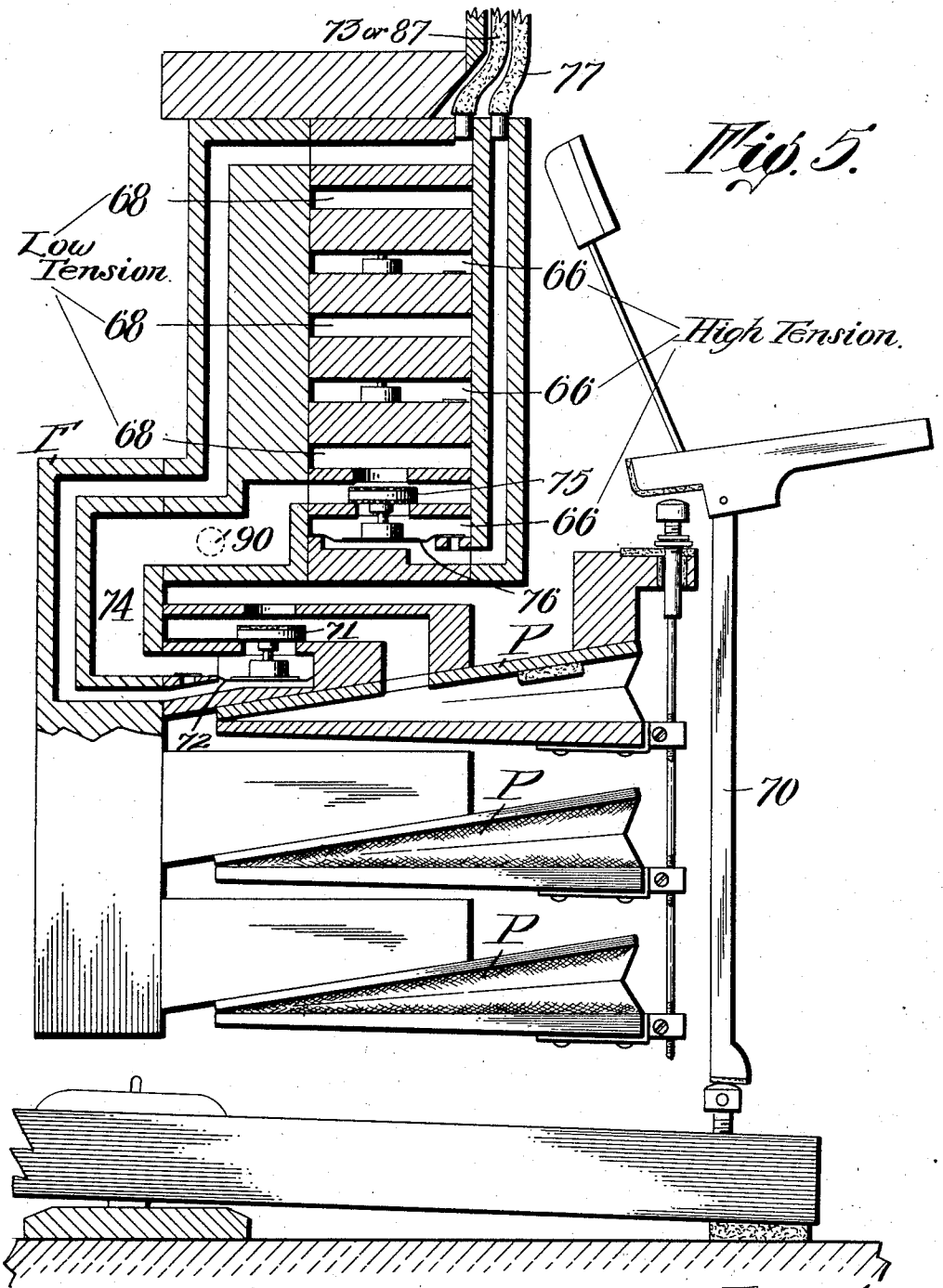

Fig. 5.

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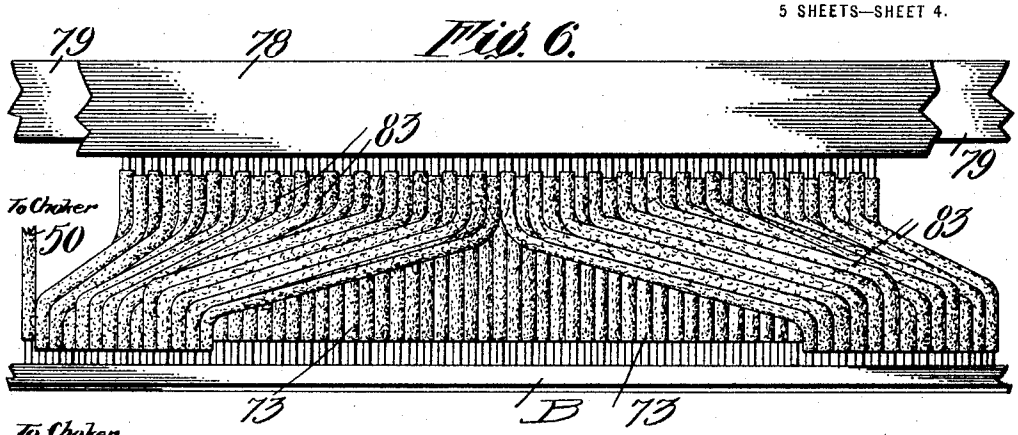

Fig. 6.

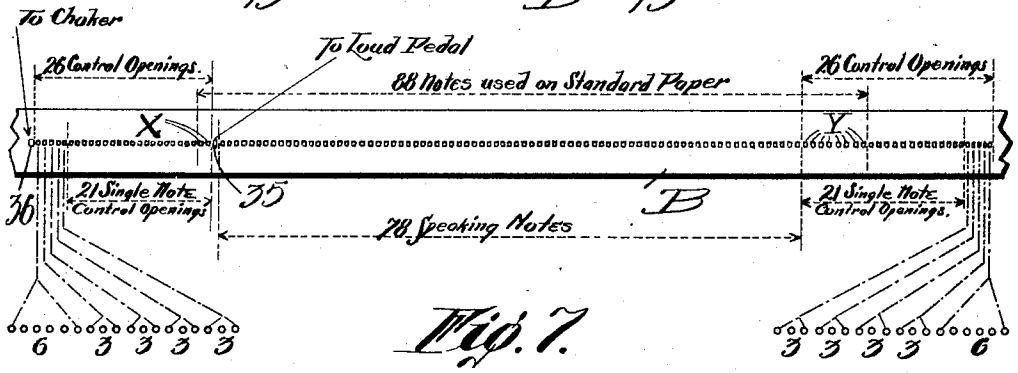

Fig. 7.

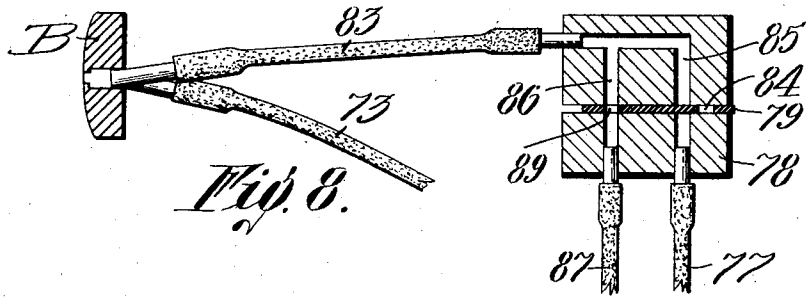

Fig. 8.

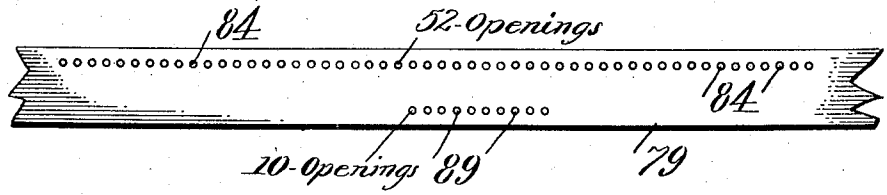

Fig. 9.

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5 SHEETS—SHEET 5.

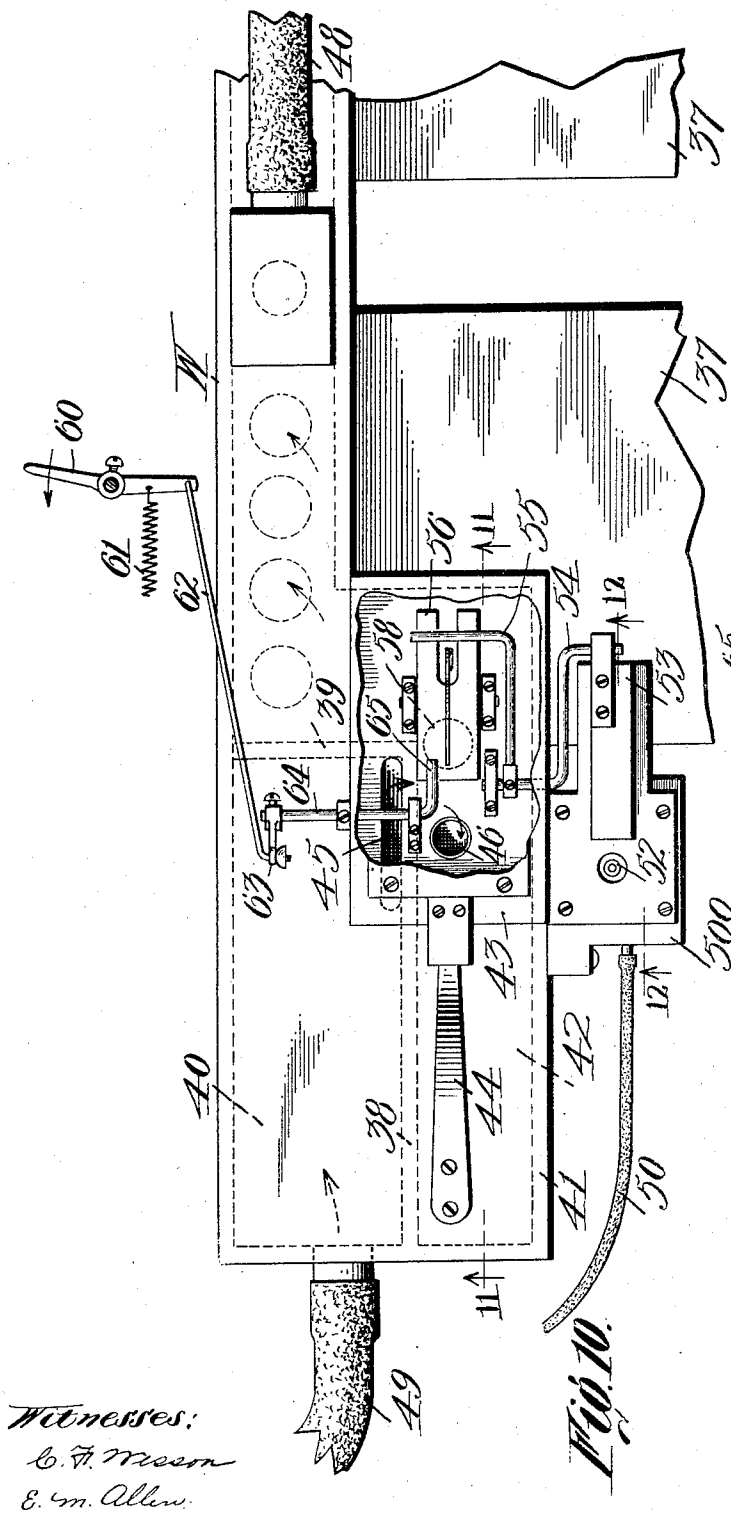

Fig. 10.

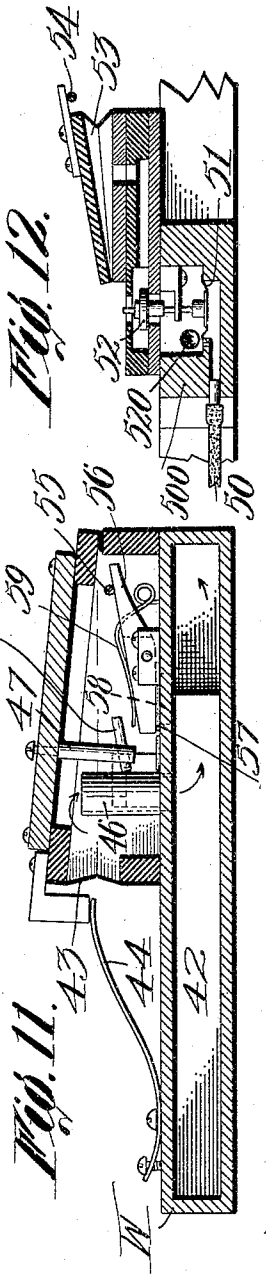

Fig. 12.

Fig. 11.

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THE COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

THEODORE PARKER BROWN, OF WORCESTER, MASSACHUSETTS, ASSIGNOR TO SIMPLEX PLAYER ACTION COMPANY, A CORPORATION OF MASSACHUSETTS.

MUSICAL INSTRUMENT.

1,179,274. Specification of Letters Patent. Patented Apr. 11, 1916.

Application filed May 13, 1912. Serial No. 696,988.

To all whom it may concern:

Be it known that I, THEODORE P. BROWN, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented a new and useful Musical Instrument, of which the following is a specification.

The object of this invention is to arrange a player piano so that it can be used for ordinary or unaccented playing, or so that it can be used as an accenting instrument wherein any desired note or notes can be played louder than the other notes, such for illustration as playing the melody of a piece of music louder than the accompaniment.

To this end the instrument is arranged so that an ordinary or standard width note-sheet can be employed therein, or so that a wider note-sheet having openings for the music and accent controlling openings can be employed therein.

The instrument is also arranged so that when the music spool containing either note-sheet is inserted, the act of placing the same in the instrument will adjust the mechanisms for proper action. That is to say, when the standard note-sheet is placed in position, the instrument will be adjusted to play in the ordinary way, or when the wide note-sheet employed for accent playing is inserted, the instrument will be adjusted to operate as an accenting instrument.

The instrument as shown is arranged for use with the ordinary standard eighty-eight note-sheet or for use with a wider note-sheet having seventy-eight speaking openings and a number of accent controlling openings. The number of accent controlling openings is usually made less than the speaking controlling openings, sav fifty-two accent controlling openings with seventy-eight speaking openings as the lowest and also highest notes are rarely accented together. It will also be noticed that with this arrangement, ten openings in the tracker are used as speaking controlling openings with the standard note-sheet and as accent controlling openings with a wide note-sheet. To accommodate this arrangement a switching mechanism is provided which will automatically set these openings for proper coöperation with either note-sheet. The numbers of openings above given are merely illustrative and of course the particular number can be varied to suit other widths of note-sheets.

The best form of apparatus now known to me for practising the invention is illustrated and described in this application for patent.

Referring to the accompanying five sheets of drawings, Figure 1 is a front elevation partly in section of the apparatus, Fig. 2 is a partial front elevation on an enlarged scale illustrating the tracker, music roll bearings, and take-up spool, Fig. 3 is a plan view of part of the mechanism shown in Fig. 2, Fig. 4 is a side elevation of the spool box, Fig. 5 is a cross sectional elevation on enlarged scale through the valve chest, Fig. 6 is a plan of the tracker and tube connections to the switch, Fig. 7 is a front elevation partly in diagram illustrating the tracker connections, Fig. 8 is a sectional elevation illustrating the connections between the tracker and switch, Fig. 9 is a plan of the switch plate, Fig. 10 is a partial front elevation of the wind-trunk and choker mechanism, Fig. 11 is a sectional plan view on the line 11—11 of Fig. 10, Fig. 12 is a sectional plan view on the line 12—12 of Fig. 10, and Figs. 13 and 14 are detailed views illustrating the bolt construction for holding the valve chest together.

Referring to the drawings and in detail, A designates the spool box in which is mounted the tracker B. The take-up spool C and journals for holding music rolls of different widths is hereinafter described.

D designates the usual pneumatic motor and E a system of gearing arranged between the same and the spool box so that the take-up spool can be rotated to draw the note-sheet forward over the tracker, or so that the music spool or roll can be rotated for re-winding. This motor and gearing may be of any usual construction and need not be described in detail in this application.

The parts previously described are mounted on a valve chest F which is arranged above a wind-trunk W.

The spool box is constructed so that a standard or a note-sheet wider than the standard can be employed therein, this latter note-sheet being hereinafter termed the wide note-sheet.

The take-up spool C is reduced at its ends as at 10 and fitting on these reduced por-

tions are cylinders 11 of the same outside diameter as the central portion of the take-up spool. These cylinders are provided at their ends with flanges 12 and springs 13 are arranged in the reduced portions of the take-up spool to bear on the cylinders 11 so that the same will be held in the positions shown in full lines, or in the positions shown in dotted lines in Fig. 2. Collars 14 are arranged on the shaft or shafts 15 of the take-up spool against which the flanges 12 are pulled when the wide note-sheet is to be employed. By this arrangement the take-up spool can be adjusted to take either a standard width note-sheet or a wide note-sheet.

16 designates the right-hand spindle for the music spool which is journaled in the wall of the spool box and which is provided with the usual tenon to engage into the music spool.

17 designates the left-hand spindle for the music spool, which is journaled in the wall of the spool box and which has a spring 18 fitted on a reduced portion thereof. This reduced portion of the spindle 17 is fitted in a bracket 19 secured to the spool box against which the spring 18 bears and the spindle is provided with a collar 20 which limits its inward spring-pressed movement. By these arrangements, a wide music spool can be held on the spindles 16 and 17.

A shaft 21 is journaled in the spool box. On the right-hand end of this shaft is secured an arm 22 which carries a bushing 23 at its end, in which is fitted a supplemental spindle or plunger 24, which has at its left-hand end a tenon 25 corresponding to the tenon on the spindle 16, and a socket or mortised end 26 which can engage the tenon on the spindle 16. The bushing 23 is provided with a wall 27 in which a reduced portion of the spindle 24 is fitted and a spring 28 is arranged around said portion so as normally to force the supplemental spindle to the right to cause the end 26 thereof to engage the end of the spindle 16. Another arm 29 is secured on shaft 21 and carries a bushing 30 in which is housed another supplemental spindle 31 which has a reduced portion on which is fitted a spring 32 engaging a wall 33 in said bushing 30 so as normally to force this supplemental spindle to the right. By swinging the arms 22 and 29 down in line with the spindles 16 and 17 the two supplemental spindles 24 and 31 will be brought into position so that a standard music spool can be employed. When this is done the cylinders 11 are pushed toward the middle of the take-up spool 10. By lifting the arms 22 and 29 a wide music spool can be employed and when this is done the cylinders 11 are pulled outwardly on the take-up spool.

The shaft 21 has arms 34 which connect to operate the switch plate as hereinafter described.

The tracker B is provided with one hundred and thirty openings, a loud pedal controlling opening 35 and a choker controlling opening 36. The opening 35 controls a pneumatic which operates the loud pedal in coöperation with holes cut in either music sheet in a manner old in the art and need not be hereinafter considered. The choker control opening 36 is open when the standard width note-sheet is employed and is covered when the wide music sheet is employed for a purpose hereinafter described.

The standard note-sheet is cut to control eighty-eight openings in the tracker, or all the notes of an ordinary piano. When this standard music sheet is employed the eighty-eight openings indicated in diagram in Fig. 7 are controlled. When the wide note-sheet is employed, seventy-eight openings, as indicated, are used as speaking notes; and twenty-six openings on each side thereof, or fifty two openings all together, are employed as accent controlling openings. Each of the inside twenty-one of the two sets of twenty-six control openings coöperates with a speaking note opening. Each of the next four of the two sets of twenty-six control openings coöperates with three speaking openings. Each of the outside control openings of the two sets of twenty-six control openings coöperates with six speaking openings. By this arrangement, it will be seen that two openings X at the left and eight openings Y at the right of the seventy-eight speaking notes used in connection with the wide note-sheet are employed as accent controlling openings for the wide note-sheet and as speaking notes for the standard note-sheet. This arrangement necessitates the switching mechanism hereinafter described.

Referring now to the vacuum or tension-inducing apparatus, the same is illustrated in the fifth sheet of the drawings. The usual feeders or operating bellows are indicated by the reference numerals 37—37. These feeders are arranged to exhaust the air from a wind-trunk W. The wind-trunk is provided with partitions 38 and 39 which divide off a chamber 40 at the left thereof and additional walls 41 are provided so that a chamber 42 will be arranged below the chamber 40 and the left-hand end of the wind-trunk. On front of this chamber 42 is secured a choker mechanism which consists of a pneumatic 43 held normally open by a spring 44. Air is admitted into the choker from the chamber 40 through an opening 45 and passes from the choker through a pipe 46 secured in the front wall of the wind-trunk and then passes from the chamber 42 into the main part of the wind-trunk W. These parts are arranged so that

when the choker is in operation, low tension will be induced in the chamber 40 because as the choker pneumatic collapses, the front wall thereof will engage the outer end of the pipe 46 and throttle down the flow. A limiting stop 47 is secured to the movable wall of the pneumatic so as to prevent the same absolutely from closing.

When the parts thus described are in operation, low tension will be induced in the chamber 40 and high tension in the wind-trunk W. The wind-trunk W connects by a pipe 48 to the right-hand side of the valve chest F and the chamber 40 of the wind-trunk connects by a pipe 49 to the left-hand side of the valve chest F. Thus when the choker is in operation, high tension will be induced in the right-hand pipe 48 and low tension in the left-hand pipe 49.

In ordinary playing with the standard note-sheet, it is desirable to render the choker normally inoperative and the following construction is used for this purpose. The choker controlling opening 36 in the tracker is connected by a tube 50 to a valve box 500 secured to the lower side of chamber 42 and containing a diaphragm 51 controlling a valve 52 which controls an opening extending into a pneumatic 53. The space between the diaphragm and valve is connected to the chamber 42 by an opening 520.

When the wide note-sheet is in the instrument, the choker controlling opening 36 is covered and the valve 52 remains in the position shown in Fig. 12 and the pneumatic 53 is connected to the atmosphere.

When the standard note-sheet is used, the choker control opening 36 is uncovered and the valve 52 is forced outwardly by the diaphragm, and the pneumatic 53 is thus connected to the chamber 42 and collapsed. The movable leaf of the pneumatic 53 is connected to a bent arm or lever 54 which extends inside of the pneumatic 43 and which has an arm 55 thereon. This arm 55 bears on a tilting pivoted block 56 which carries a valve 57 which controls an opening 58 formed in the front wall of the chamber 42. This block is pressed by a spring 59 so as normally to close said opening 58. When the choker controlling opening 36 is uncovered, the said pneumatic 53 operates and moves the valve 57 from the opening and hence there is a free passage from the choker pneumatic 43 into the wind-trunk and hence the choker becomes inoperative. Thus when the standard width note-sheet is employed, the choker does not work. It is desirable, however, in some cases to throw the choker into operation when using the standard width note-sheet and this can be done by means of an operating handle 60 arranged in the usual position, which handle is normally pulled in one direction by a spring 61 and which connects by a link 62 to a lever 63 on a shaft 64 extending into the casing of the choker pneumatic 43 and having an arm 65 which bears on the block 56. By moving the handle to the left, as shown in Fig. 10, the valve 57 can be kept from opening, or its degree of opening can be regulated and thus the choker can be thrown into operation to the desired degree when using the standard width note-sheet. Thus when the standard note-sheet is used, the choker is inoperative but can be brought into operation by manipulation of lever 60, and when the wide note-sheet is employed the choker is brought into operation.

Referring now to the details of the valve chest, the same is specifically illustrated in Fig. 5. The valve chest has three horizontally extending chambers 66—66—66 to which the pipe 48 connects by a vertical opening 67, (see Fig. 1.) The valve chest also has three horizontally extending openings 68—68—68 spaced between the openings or chambers 66 to which the pipe 49 is connected by a vertical passage 69. The operating pneumatics P are arranged on arms extending from the wind-chest and are usually arranged in three banks, as shown. Each pneumatic is provided with a vertically operating abstract 70 which engages the wippen of its piano action. Each pneumatic is controlled by a valve 71 connected to a diaphragm 72. When the ports are in normal position the pneumatic is connected to the atmosphere.

The seventy-eight openings in the tracker are connected by tubes 73 under the diaphragms of the pneumatics and the openings X and Y are also connected under said diaphragms, as hereinafter described, by tubes 87. The valves 71 and diaphragms 72 are arranged in the ordinary way so that when a perforation in the note-sheet uncovers an opening in the tracker, air will be admitted under the diaphragm 72, the valve 71 lifted, and the pneumatic operated by reason of its connection to the chamber 74. The chamber 74 for each pneumatic extends out between a chamber 66 and a chamber 68 and the connection of the chamber 74 thereto is controlled by an accent controlling valve 75 connected to a diaphragm 76.

Referring now to the details of the switching mechanism, it will be seen that a switch base 78 is secured to the back of the spool box A and fitted to slide in the same is a switch plate 79 which is connected by links 80, levers 81 and links 82 to the arms 34—34 on the shaft 21 previously mentioned. Each of the twenty-six control openings at each side of the tracker is connected by a tube 83 to the switch base. The switch plate is provided with a row of fifty-two holes 84 arranged as shown so that when the switch plate is pulled forward, which takes place when the wide note-sheet

is employed, the tubes 83 are connected with the tubes 77 through passages 85 in the switch base and the accenting mechanism becomes operative. The passages 85 connected to the tubes 83 coming from the two openings X in the tracker at the left and the eight openings Y at the right of the seventy-eight speaking notes employed with the wide note-sheet are connected by passages 86 in the switch base to tubes 87 which connect under the diaphragms 72 of the operating pneumatics P controlled thereby.

The switch plate 79 is provided with ten openings 89 which come into register when the switch plate is moved backwardly, which happens when the standard width music is employed. Thus these two holes X at the left and eight holes Y at the right operate both as speaking controlling openings with the standard eighty-eight note music, or as accent controlling openings with the wide music.

The way the five extreme openings on each end of the tracker are connected to control a number of accent controlling valves 75 is preferably by boring holes 90 in the valve chest, whereby each hole controls a number of accent controlling valves. The sections of the valve chest are held together by bolts 91 which are threaded into nuts 92 set tightly in holes in sockets to keep them from turning, and spring washers 93 are arranged under the heads of the bolts. This arrangement provides for a positive holding of the sections together which will compensate for shrinkage.

The operation of the parts is as follows: When the ordinary standard width eighty-eight note music sheet is employed, the cylinders on the take-up spool are left in the position shown in Fig. 2 and the arms 22 and 29 are swung downwardly. This will automatically set the switch plate so that the two tracker openings X and the eight tracker openings Y will be connected through the openings 89 in the switch plate to control the operating pneumatics to which the ten tubes 87 extend. As choker control opening 36 is uncovered, the choker will be inoperative and the same tension will exist throughout all the chambers 66—66—66 and 68—68—68. As the switch plate occupies the position shown in Fig. 8, the accent controlling openings will be inoperative and the accent controlling valves 75 in the windchest will all remain down. Hence the instrument can be played in the ordinary way; and as previously described, the choker can be employed by operating lever 60 if it is desired to regulate the pressure in the chambers 68 and thus the playing of the instrument. Now if it is desired to use the instrument as an accenting instrument, the specially cut wide note-sheet is employed. This note-sheet is cut so as to control the seventy-eight speaking openings and if notes are to be accented, the note-sheet is also perforated with the proper openings controlling the accent. When a wide note-sheet is employed, the cylinders 11 are pulled outwardly on the take-up spool and the arms 21 and 29 are moved back. This throws the switch plate 79 so that all the tubes 83 will be connected to the tubes 77. Thus the twenty-six openings at each end of the tracker will be used simply as accent controlling openings. When the wide note-sheet is placed in the instrument, the choker controlling opening 36 will be covered and hence the choker will be brought automatically into operation to cause the variance of tension between the chambers 66—66—66 and 68—68—68. Now the instrument will be played as an accenting instrument. When the note is to be played with a low tension, the same is cut simply in line with one of the seventy-eight speaking openings. When a note is to be accented, it is cut additionally in the note-sheet so as to uncover its proper accent controlling note in the twenty-six control openings at the right or the twenty-six control openings at the left of the tracker, as illustrated at Z in Fig. 1. The action controlling openings Z are cut slightly in advance of the openings which control the operating pneumatics P. When a note is to be accented, the opening Z allows air to flow through a tube 77 under the diaphragm 76 of the particular valve 75 controlled thereby and lifts the valve 75 so that when the particular operating valve 71 is brought into operation the particular chamber 74 will be connected to a chamber 66 which contains high tension. In playing without accent the valve 75 will be down and the chamber 74 will be connected to a chamber 68 which contains low tension. The controlling of a number of valves 75 by the five extreme right-hand and five extreme left-hand tracker openings is entirely feasible, because it is very rare that these notes are used and extremely rare that an accented and an unaccented note comes at the same time in these divisions. Thus with the arrangements described, the instrument can be used with the ordinary standard eighty-eight note music or can be employed as an accenting instrument to play seventy-eight notes. When used as an accenting instrument the melody can be most beautifully brought out over the accompaniment, depending upon the degree at which the choker is set to act. It also will be noted that the most unskilled operator will adjust the instrument for proper playing without any difficulty, as the adjustments are made simply by putting in the standard or the wide width music spools.

The details and arrangements herein shown and described may be greatly varied

by a skilled mechanic without departing from the scope of my invention as expressed in the claims.

Having thus described my invention, what I claim is:—

1. A player piano having, in combination, a plurality of action operating devices, means to operate said devices as a non-accenting instrument with one width of note sheet, and to operate said devices as an accenting instrument with a different width of note sheet, sheet supporting devices adjustable to sheets of different widths, and connections from said sheet supporting devices to said means effective to determine the accented or non-accented operation of the instrument in accordance with the adjustment of said sheet supporting devices.

2. A player piano having, in combination, a plurality of action operating devices, means to operate said devices as a non-accenting instrument with a standard note sheet, and to operate said devices as an accenting instrument with a wider note sheet, sheet supporting devices adjustable to sheets of different widths, and connections from said sheet supporting devices to said means effective to determine the accented or non-accented operation of the instrument in accordance with the adjustment of said sheet supporting devices.

3. A player piano having, in combination, a plurality of action operating devices, means to operate said devices as a non-accenting instrument with one width of note sheet, means to operate said devices as an accenting instrument with a different width of note sheet, spindles for holding music spools of different widths, and devices controlled by the adjustment of said spindles effective to determine the accented or non-accented operation of the instrument.

4. A player piano having, in combination, a plurality of action operating devices, means to operate said devices as a non-accenting instrument with a standard note sheet, means to operate said devices as an accenting instrument with a wider note sheet, spindles for holding music spools of different widths, and devices controlled by the adjustment of said spindles effective to determine the accented or non-accented operation of the instrument.

5. A player piano having, in combination, a plurality of action operating devices, means to operate said devices as a non-accenting instrument with one width of note sheet, means to operate said devices as an accenting instrument with a different width of note sheet, spindles for holding the music spool carrying the wide note sheet, supplemental spindles which can be brought into position to hold the music spool carrying the narrower note sheet, and devices controlled by the position of the supplemental spindles effective to determine the accented or non-accented operation of the instrument.

6. A player piano having a set of spindles, a shaft carrying a set of supplemental spindles which can be swung into line with the first set of spindles so that music spools of different width can be employed, and switching mechanism operated from said shaft to effect the adjustment of the instrument to act with the different widths of music sheets.

7. In a player piano, a wind-trunk, means for inducing a heavy air tension therein, a chamber in the wind-trunk, a choker between the wind-trunk and said chamber so that low tension will be produced in said chamber, a set of operating pneumatics, a set of valves therefor, a wind-chest having a set of accent controlling valves, connections from the wind-trunk and chamber to the valve chest, a pneumatic for controlling the choker, and a choker controlling opening located in such a position in the tracker, that when a standard note-sheet is placed in the instrument the choker control opening will be uncovered and the choker thereby rendered inoperative, and that when a wide note-sheet having accent controlling openings is placed in the instrument the choker controlling opening will be covered and the choker thereby brought into operation.

8. In a player piano, a wind-trunk, means for inducing a heavy air tension therein, a chamber, a choker between the wind-trunk and said chamber so that low tension will be produced in said chamber, a set of operating pneumatics, a set of valves therefor, a windchest having a set of accent controlling valves, connections from the wind-trunk and chamber to the valve chest, a pneumatic for controlling the choker, a choker controlling opening located in such a position in the tracker, that when a standard note-sheet is placed in the instrument the choker control opening will be uncovered and the choker thereby rendered inoperative, and that when a wider note-sheet having accent controlling openings cut therein is placed in the instrument, the choker controlling opening will be covered and the choker thereby brought into operation, and means for manually bringing the choker into operation when playing with a standard width music sheet.

9. In a player piano, a wind-trunk, means for inducing a heavy air tension therein, a chamber, a valve chest, direct independent connections from said wind trunk and said chamber to said valve chest, a pneumatically operating choker between the wind-trunk and chamber for effecting low tension in said chamber, said choker having an additional opening between the choker and

wind-trunk, a valve for controlling said opening, a pneumatic for controlling this valve, a tracker having an opening for controlling this pneumatic, means for adjustably closing said valve by overcoming the control pressure of the pneumatic, and connections whereby said means may be manually operated during the operation of the instrument to vary the air tension therein.

10. A player piano having a tracker, a set of operating pneumatics and valves, a set of accent controlling valves, and a switching mechanism arranged effective when a music spool carrying a standard note-sheet is placed in the instrument to render the accent controlling valves inoperative, and when a music spool carrying a wide note-sheet having accent controlling openings therein is placed in the instrument, to render part of the openings in the tracker which were used as speaking openings with the standard note-sheet operable as accent controlling openings.

11. A player piano having a tracker, a set of operating pneumatics and valves, a set of accent controlling valves and a switching mechanism comprising a base and a sliding-plate, said plate having two series of openings effective when in one position to render the accent controlling valves inoperative and when in another position to render the accent controlling valves operative, said slide being also effective to render part of the openings in the tracker which were used when the instrument was arranged for non-accenting operable as accent controlling openings when the instrument is arranged for accenting.

12. A player piano having a tracker, a set of operating pneumatics and valves, a set of accent controlling valves, spindles for receiving a standard or wide width music spool, and a switching mechanism operated from said spindles effective when a music spool carrying a standard note-sheet is placed in the instrument to render the accent controlling valves inoperative, and when a music spool carrying the wide note-sheet having accent controlling openings therein is placed in the instrument, to render part of the openings in the tracker which were used as speaking openings with the standard note-sheet operable as accent controlling openings.

13. In a player piano, a wind trunk, means for inducing a heavy air tension therein, a chamber, a choker between said wind trunk and chamber for normally maintaining low tension in said chamber, a cut-out valve for increasing the tension in said chamber, manual and sheet-controlled devices for opening said valve, a valve chest, direct independent connections from said wind trunk and said chamber to said valve chest, connections from said valve chest to the operating pneumatics of the instrument and sheet-controlled valves for shifting the connection of each pneumatic so that said pneumatic may be connected to either the high or the low tension, as indicated by the note sheet.

In testimony whereof I have hereunto set my hand, in the presence of two subscribing witnesses.

THEODORE PARKER BROWN.

Witnesses:

LEWIS W. SOUTHGATE,

C. FORREST WESSON.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."