

C. S. BURTON.
 DUPLEX DUCT TRACKER FOR AUTOMATIC MUSIC PLAYING INSTRUMENTS.

958,721.

APPLICATION FILED JULY 5, 1907.

Patented May 24, 1910.

7 SHEETS—SHEET 1.

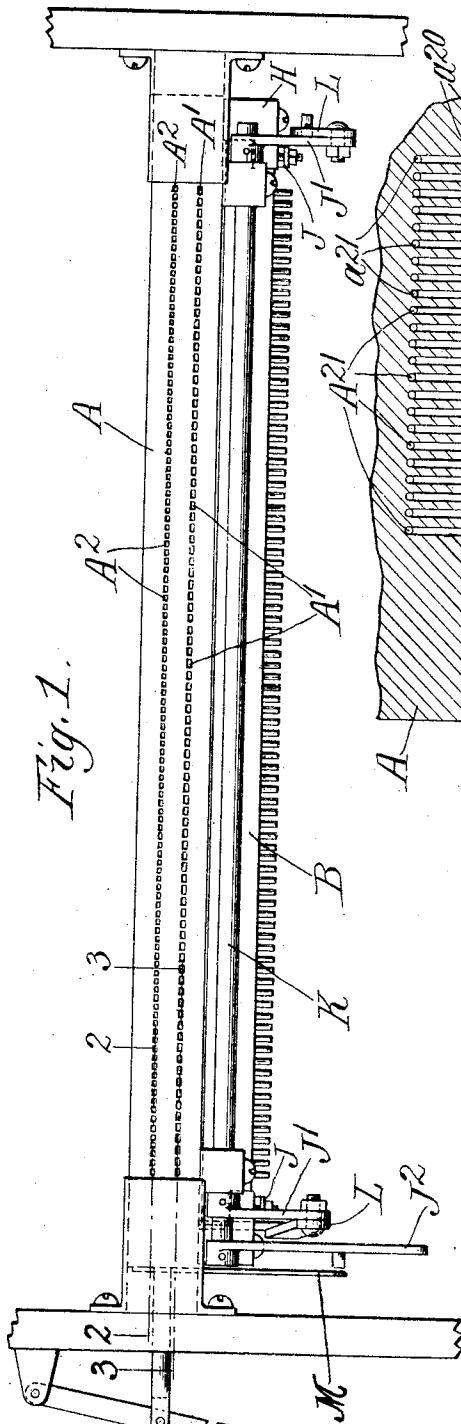


Fig. 1.

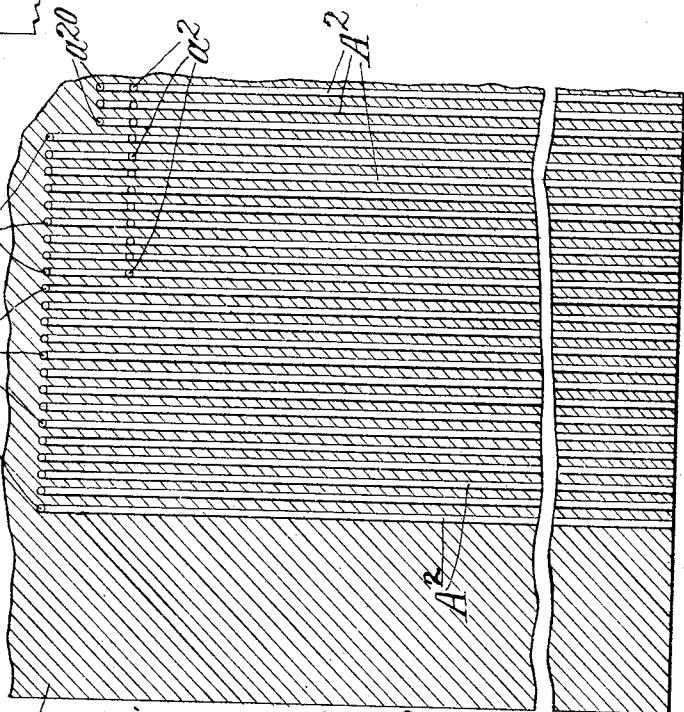
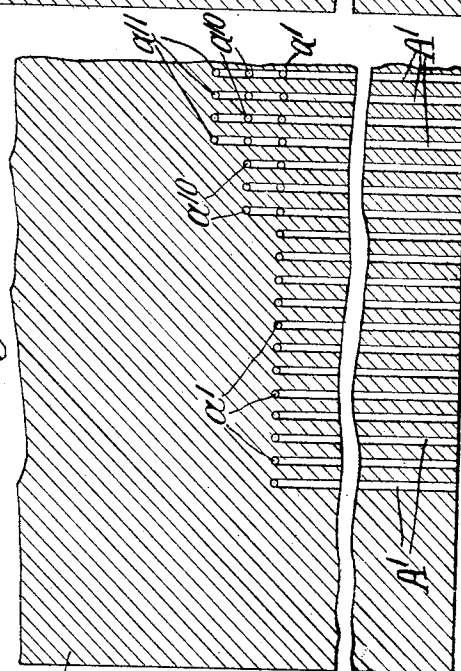


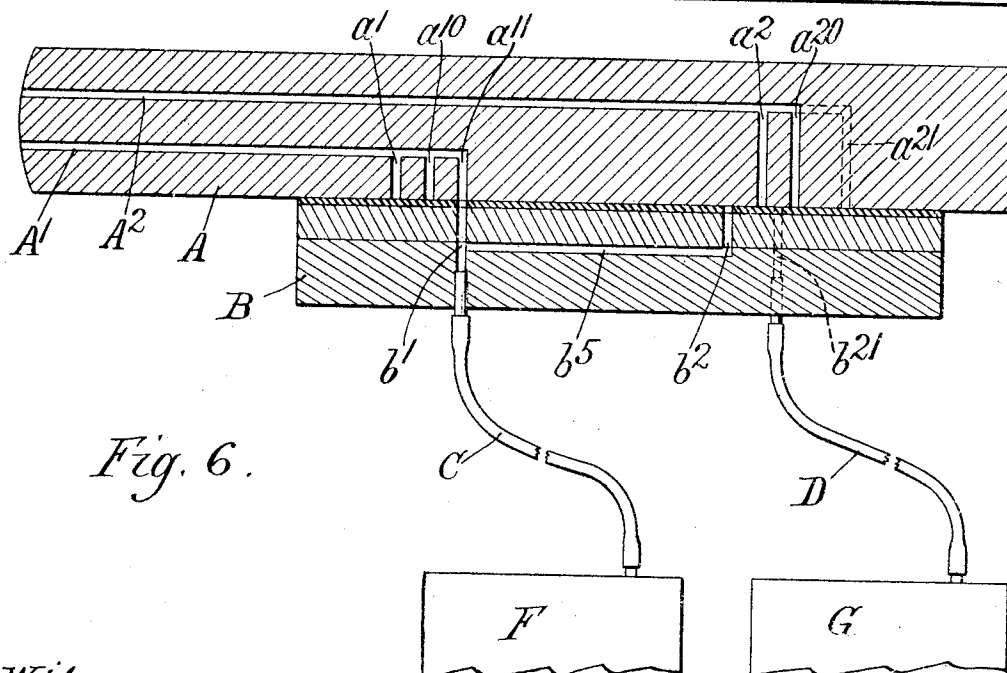
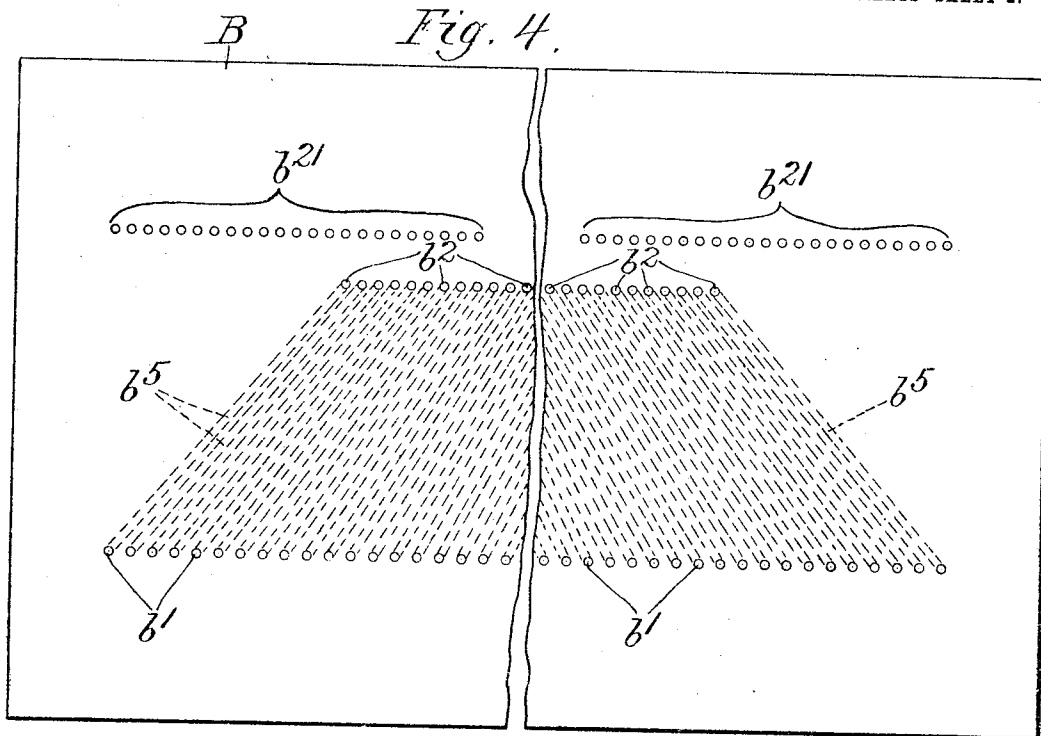
Fig. 2.

Fig. 3.



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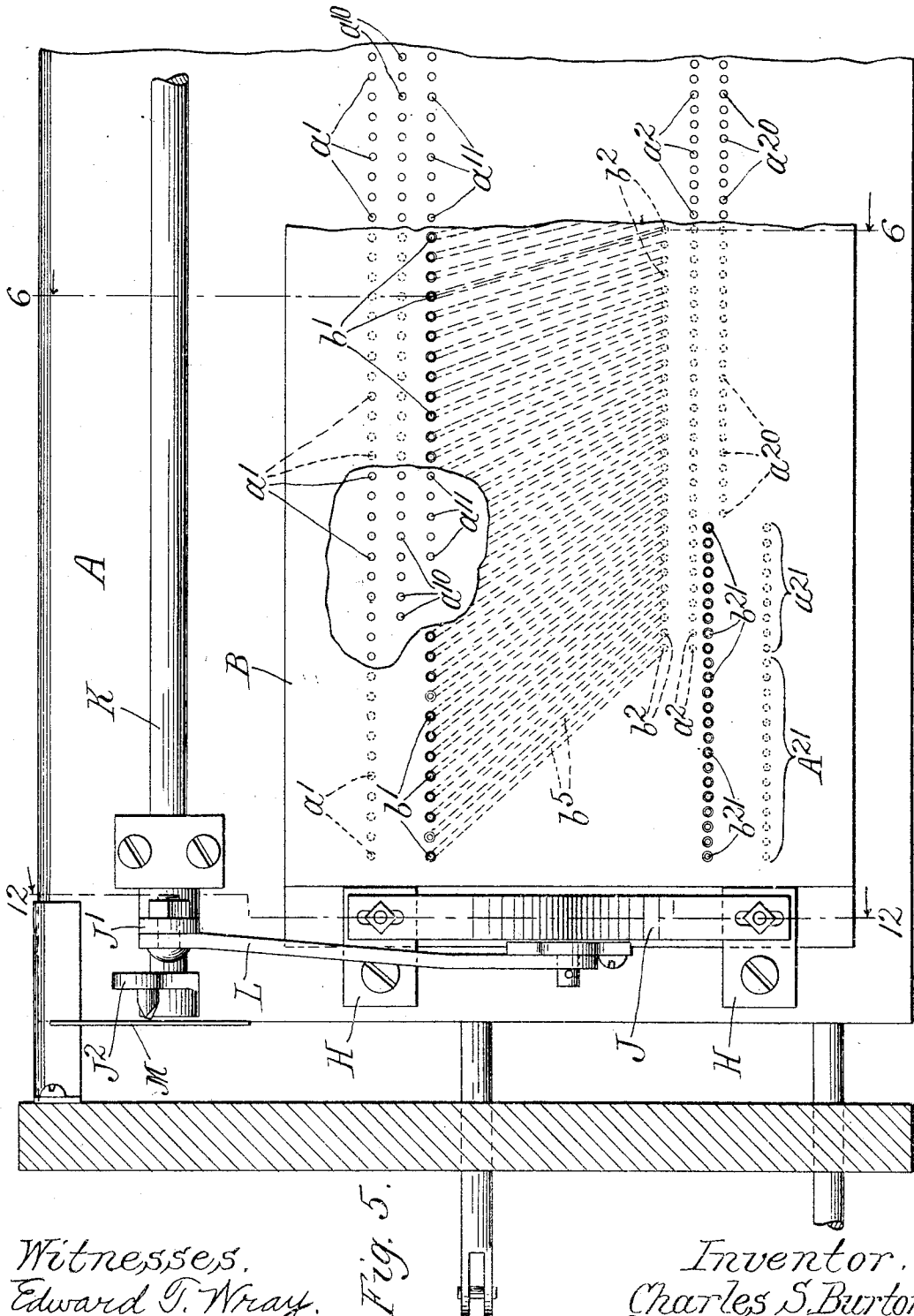
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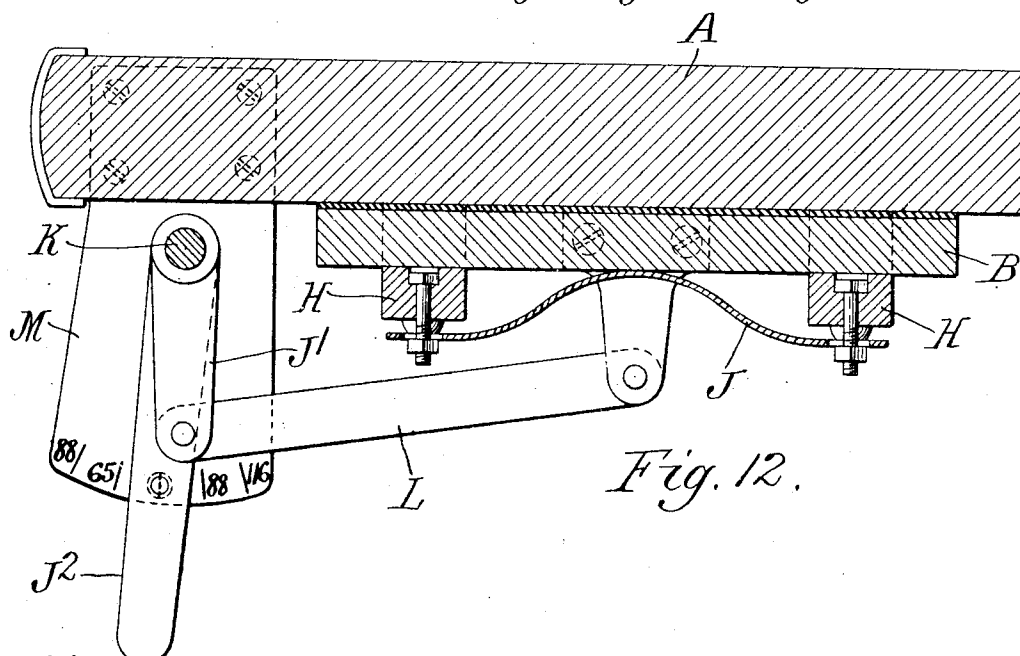
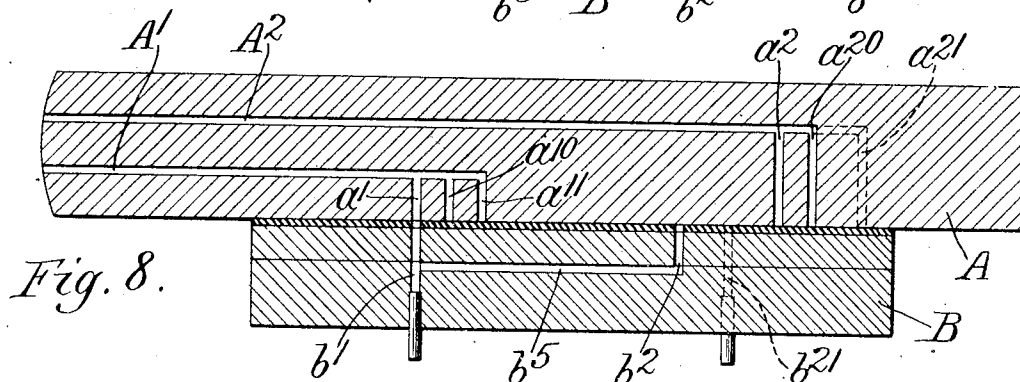
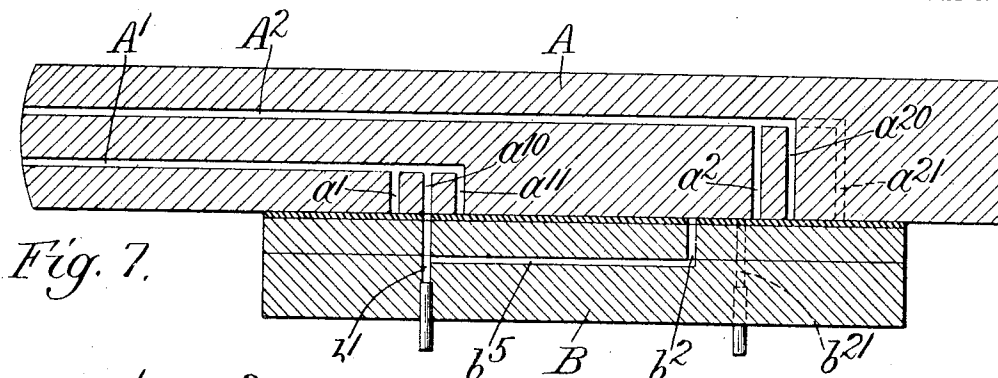
7 SHEETS—SHEET 3.



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Fig. 5.

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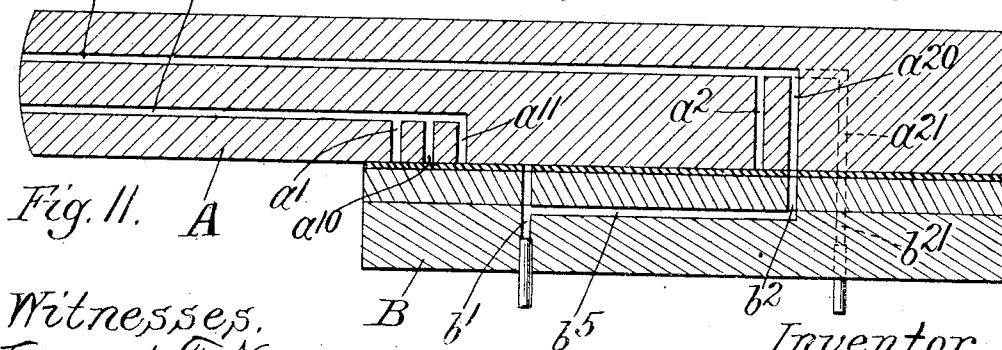
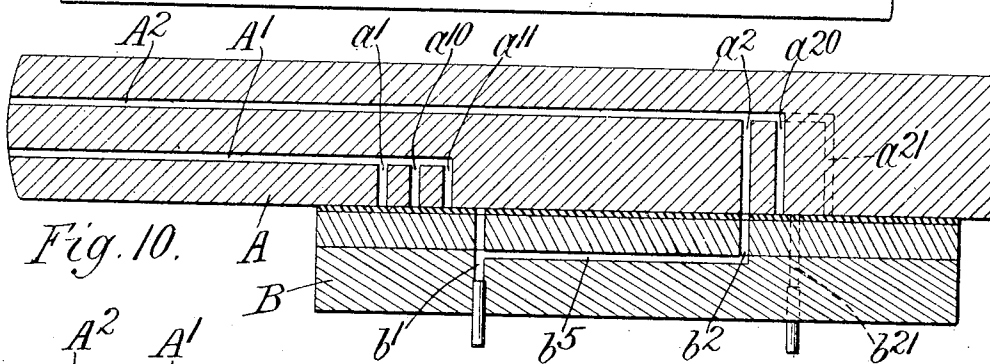
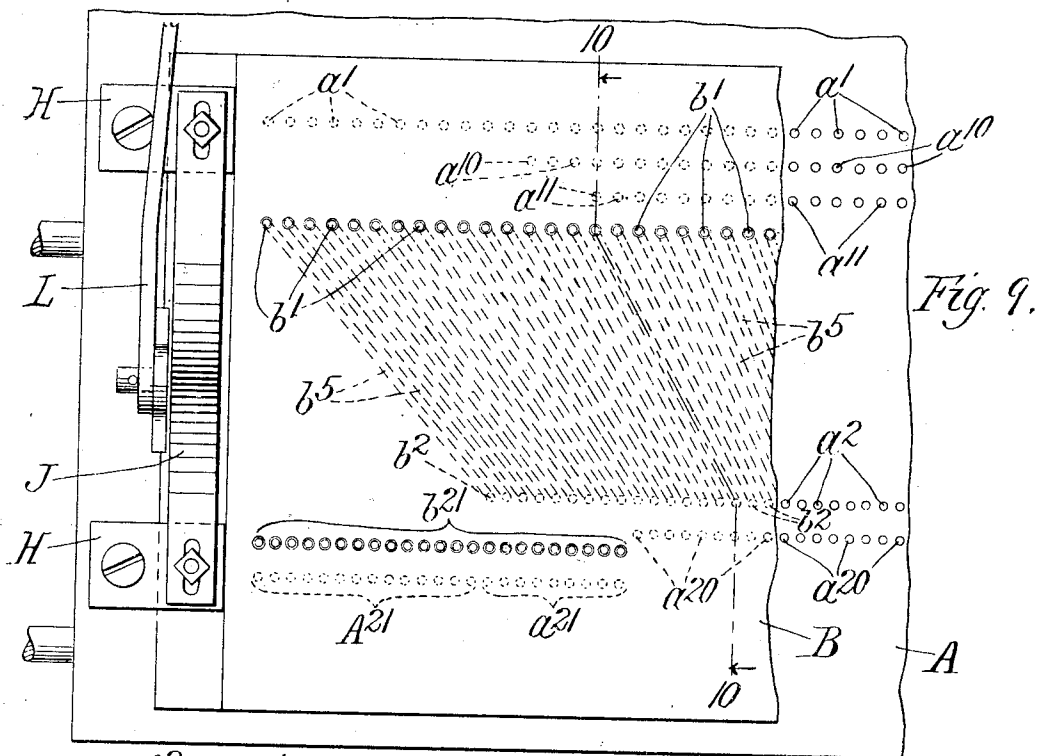
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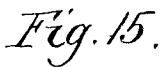
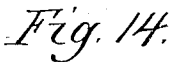
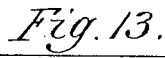
Witnesses.
 Edward T. May.
 J. S. Abbott

Inventor.
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DUPLEX DUCT TRACKER FOR AUTOMATIC MUSIC PLAYING INSTRUMENTS.

Patented May 24, 1910.

7 SHEETS—SHEET 6.



4 621st Inventor,
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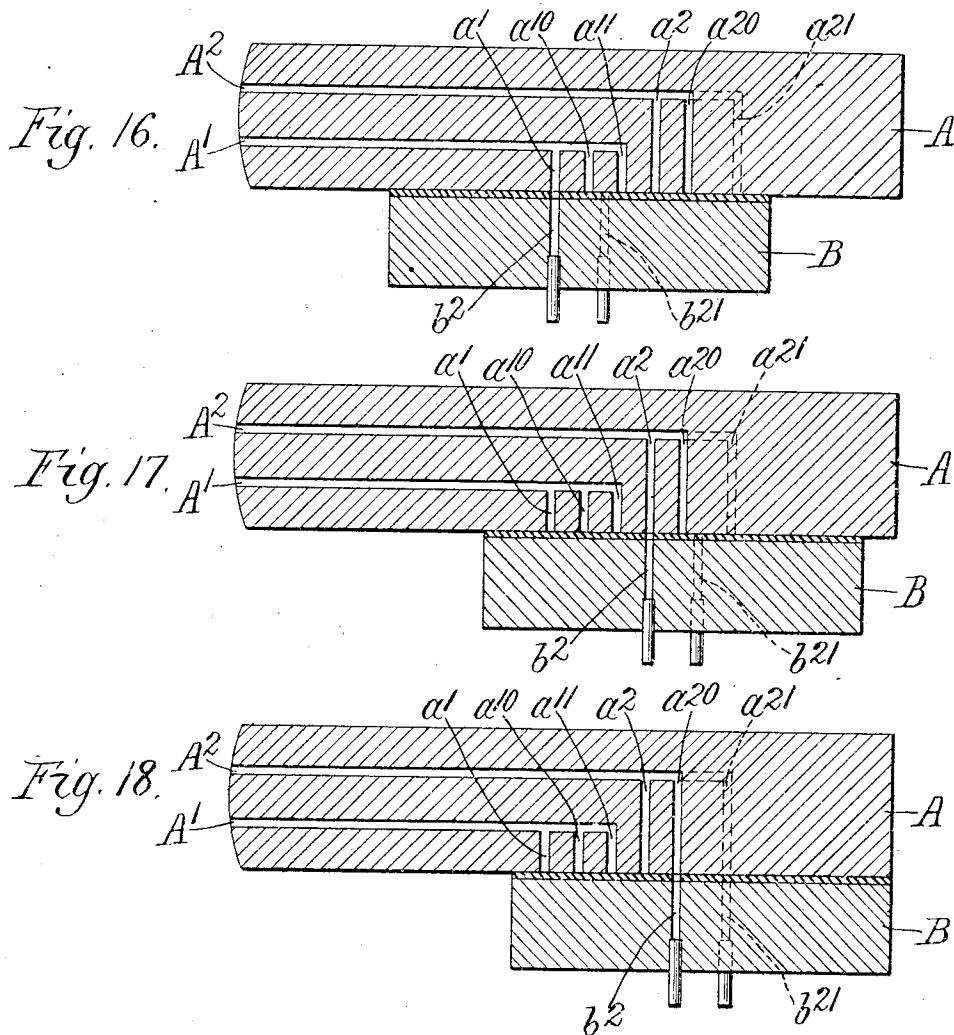
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7 SHEETS—SHEET 7.



Witnesses.
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 J. S. Abbott

Inventor.
 Charles S. Burton
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UNITED STATES PATENT OFFICE.

CHARLES S. BURTON, OF OAK PARK, ILLINOIS, ASSIGNOR TO MELVILLE CLARK, OF CHICAGO, ILLINOIS.

DUPLEX DUCT-TRACKER FOR AUTOMATIC MUSIC-PLAYING INSTRUMENTS.

958,721.

Specification of Letters Patent.

Patented May 24, 1910.

Application filed July 5, 1907. Serial No. 382,136.

To all whom it may concern:

Be it known that I, CHARLES S. BURTON, a citizen of the United States, residing at Oak Park, in the county of Cook and State of Illinois, have invented new and useful Improvements in Duplex Duct-Trackers for Automatic Music-Playing Instruments, of which the following is a specification, reference being had to the drawings forming a part thereof.

The purpose of this invention is to provide an improved construction of tracker device for an automatic music-playing instrument to adapt such instrument to be operated with perforated controller sheets cut to different scales, and with different numbers of apertures for playing either a greater or less portion of the range of the manual of the instrument, and also for connecting with playing mechanism which comprises a separate pneumatic action for playing solo parts or accentuating or emphasizing the melody to distinguish it from the accompaniment, and for coöperating for that purpose with a perforated controller sheet having a separate series or set of apertures for controlling such melody or solo action.

It consists of the features of construction shown and described, as indicated in the claims.

In the drawings:—Figure 1 is an edge elevation of a tracker board or mouth piece having features of this invention and having the valve bar for controlling the connections for the different purposes mounted directly on the tracker board. Fig. 2 is a section at the line 2—2 on Fig. 1. Fig. 3 is a section at the line 3—3 on Fig. 1. Fig. 4 is an inner face view of the valve bar for coöperating with the tracker board shown in Fig. 2. Fig. 5 is an inverted plan view showing the tracker board with the valve bar thereon, each partly broken away, the parts being at relative position for playing 58-note music cut to the wider scale. Fig. 6 is a section at the line 6—6 on Fig. 5. Fig. 7 is a view similar to Fig. 6 showing the tracker board and bar relatively adjusted for 65-note music cut to the wider scale. Fig. 8 is a view similar to Fig. 6 showing the parts adjusted for playing 88-note music cut to the wider scale. Fig. 9 is a detail view similar to Fig. 5 showing a part only of the tracker board and valve bar adjusted

for playing 88-note music cut to the narrower scale. Fig. 10 is a section at the line 10—10 on Fig. 9. Fig. 11 is a view similar to Fig. 10 showing the board and bar adjusted for playing an accompaniment to the range of any determined number of notes, as 70, with perforated sheet cut to the narrower scale, and a melody or solo within the range of 46 notes, for which the perforations are cut on the same sheet to the same narrower scale, the perforated sheet having 116 lines of perforations in that scale. Fig. 12 is a section at the line 12—12 on Fig. 5, showing means for adjusting the valve bar to the various positions. Fig. 13 is a view similar to Fig. 5 showing a modification. Fig. 14 is a section at the line 14—15 on Fig. 13. Fig. 15 is a section at the line 14—15 on Fig. 13 showing the valve adjusted to a position for playing 65-notes with music cut to the wider scale. Fig. 16 is a similar view showing the valve adjusted for playing 88 notes with similar music. Fig. 17 is a similar view showing the valve adjusted for playing 88 notes with music cut to the narrower scale and without solo. Fig. 18 is a similar view showing the valve adjusted for playing with music cut to the narrower scale, 70 notes of accompaniment and 46 notes of solo.

This invention is illustrated in the principal figures applied to a unitary tracker board,—that is, a board in which the mouth piece is over the edge of the duct board; but, as well understood, the mouth piece may be a detached element connected with the duct board by flexible tubes whenever it is desired to gain more convenient space for the latter than can be afforded at the position where the mouth piece is preferably located; and in Fig. 15 I have shown in a diagrammatic way such a modification which will require no further particular description, it being understood that the duct board and the valve bar thereon are related precisely as in the other structure in which the duct board is integral with the mouth piece, forming a unitary tracker board.

Describing the construction shown in Figs. 1 to 14 inclusive, A represents a tracker board having two sets of duct mouths, A¹ and A². The set, A¹, may be understood as having the apertures spaced $\frac{1}{2}$ of an inch between centers, and the set, A², as having the duct mouths spaced $\frac{1}{4}$ inch between

centers, so that within standard or commercial length of the tracker board, 88 apertures of the wider spaced set occupy substantially the space of 116 of the narrow spaced set; or, to make the statement from the point of view of a commercial reason for the relation,—65 apertures of the wide space set occupy so nearly the same portion of length as 88 apertures of the narrow space set, that sheets or rolls of so-called 65-note music cut on the standard wide space scale are of the same width as the sheets or rolls of 88-note music cut on the narrower scale, 88 notes being the ordinary range of a pianoforte manual, and being the maximum number of notes for the playing of which provision is to be made.

As will hereinafter more particularly appear, the apertures for 88 notes in set A^2 , corresponding to the entire number of apertures in set A^1 , occupy the middle portion of the set, A^2 , the remaining 28 notes—14 at each end—being devoted to other use, as hereinafter explained.

In order that the reason for the detail construction about to be described may be in mind while following the description, it should be stated that the construction is designed to put in service either (a) 58 notes of the wider scale for playing so-called 58-note music; (b) 65 notes of the wider scale; (c) the entire 88 notes of the wider scale, or (d) 88 notes of the narrower scale, all operating upon the same pneumatic action; or (e) 70 notes of the narrower scale operating upon one pneumatic action and the remaining 46 operating upon a separate pneumatic action for playing solo or melody; and that for uses (d) and (e) the 23 ducts at each end outside of the middle 70 of set A^2 are to be considered in two groups consisting of 14 at the end which serve only for playing melody or solo, and the next 9 at each end which are connected with the solo or melody-playing action when the middle 70 ducts of this set are connected with the other action for playing accompaniment, but which are, together with said 70, connected with the same action for playing 88 notes without solo or melody. The detail construction for these results will now be described.

The ducts pertaining to set A^1 of tracker duct mouths, when the tracker mouth piece and duct board are unitary, are laid out in a parallel set, as seen in Fig. 3, with offset openings or ports to the lower surface of the board. The entire 88 of said ducts have such ports, a^1 , in line. The 65 ducts for service in playing 65-note music extend beyond the ports, a^1 , and have additional ports, a^{10} , and 58 of these 65 which are designed for service in playing 58-note music extend beyond the ports, a^{10} , and have each a third port, a^{11} , the ports, a^{10} and a^{11} , being respectively in lines parallel to the ports,

a^1 , and spaced therefrom a distance sufficient to leave a seat or area on the face of the board between the ports more than sufficient to cover an equal port.

The ducts pertaining to the set A^2 lie in a plane parallel to that in which the ducts of the series A^1 are situated and extend in the board past the transverse plane of the ports, a^{10} . 88 of these ducts corresponding to the 88 ducts of set A^1 have ports, a^2 , opening through the same surface of the board as the ports, a^1 , a^{10} and a^{11} , in a line parallel therewith. The 70 of these 88 ports which are designed for service in connection with separate melody-playing action extend beyond the line of ports, a^2 , and are provided with additional ports, a^{20} , opening through the same surface of the board in line parallel with the other ports. The remaining 18—9 at each end—of the first mentioned 88 ports of set A^2 extend beyond the line of ports, a^{20} , and are provided each with a third port, a^{21} , in a line parallel with the other lines of ports through the same surface of the board. The remaining 28 ducts—14 at each end—of set A^2 , in excess of the 88 first mentioned, extend to the line of ports, a^{21} , and have ports, A^{21} , in line with the ports, a^{21} , and constituting therewith a series of 46 ports—23 at each end; and these 28 ducts have no other ports beside the ports A^{21} .

A valve bar or board, B, is provided, applied to the ported face of the board, A. It has a series of ports, b^1 , corresponding to and adapted to register with, the ports, a^1 , of the board, A, and at each of these ports there is connected a flexible duct, C, the entire series of ducts, C, being designed to lead to a pneumatic action conventionally represented by the primary pneumatic chamber, F, for controlling the operation of the principal playing devices,—that is, the set to be used for all ordinary playing without melody or solo and for playing accompaniment with melody or solo. The board, B, is provided with means hereinafter described for adjusting it to cause the line of ports, b^1 to register either with the line of ports, a^1 , or with the line of ports, a^{10} , to the extent of the full 65 ports of that line, in which case the remaining 23—11 and 12 at the two ends respectively—will be closed by abutting on the unapertured portion of the face of the board, A, outside the line of ports, a^1 , or for registering with the line of ports, a^{11} , to the extent of the 58 ports of that line, the remaining 30—15 at each end—being similarly closed by abutting on the unapertured portion of the area of the board beyond said line of ports, a^{11} . It will be seen that by moving the board to these three positions it is adapted for playing either 88, 65 or 58 notes for operating with perforated controlling sheets having these numbers respec-

tively of aperture lines, and that in the case of its adjustment for 65 or 58 note sheets all unused ducts are cut off without the necessity for closing the mouth piece.

5 The board, B, has a second line of ports, b^2 , 88 in number, spaced and located for registering with the line of 88 ports, a^2 , and these ports are connected by ducts, b^5 , with the ports, b^1 , so that when this line of ports, b^2 , is registered with the ports, a^2 , of the board, A, connection is made from the 88 middle group of tracker mouths of set A^2 with the tubes, C, leading to the principal pneumatic action, and this adjustment adapts the instrument for playing with 88-note perforated controller sheets cut to the narrower scale. The valve bar, B, has also a third line of ports, b^{21} , 46 in number—23 at each end—in position to register with the corresponding 46 ports of the series, a^{21} and A^{21} , of the ports of the board, A, and from the outer side of the valve bar, B, flexible tubes, D, lead from these ports, b^{21} , to an independent pneumatic action indicated conventionally by the primary chamber, G, for playing melody or solo parts.

For convenience in indicating the positions and relative spacing of the several lines of ports in the board, A, and the valve bar, B, a certain unit of measure will be referred to as a step, being sufficient distance to include the ports, with a margin. The lines of ports, a^1 and a^{10} , are spaced between centers two steps. The lines of ports, a^{10} and a^{11} , are also spaced between centers two steps. The normal position of rest, or "out of service," of the valve bar, B, is with the line of ports, b^1 , seated on the face of the board, A, one step removed back from the line of ports, a^{11} , so that one step movement forward will bring the ports in registration with the ports, a^{11} . The line of ports, a^{20} , is spaced two steps from the ports, a^2 . In moving from the position out of service successively to registration of the ports, b^1 , with the ports, a^{11} , a^{10} and a^1 , the stages of movement are one step, three steps and five steps respectively. The ports connecting with the series of tracker mouths, A^2 , must be so situated that the corresponding ports of the valve bar shall not, in any of these movements, register with any ports of either series. At the position out of service the ports, b^2 , of the valve bar are situated against a blank face of the board, one step forward of the line of ports, a^2 , and since the movement above described for bringing the lines of ports, a^{11} , a^{10} and a^1 , successively into service is away from the line of ports, a^2 , the line of ports, b^2 , will not thereby be brought into registration with any of the ports beyond it, and in order to avoid bringing it into registration with any of the ports of the series a^{11} , a^{10} or a^1 , it is only necessary to leave sufficient space between the two lines

of ports, a^2 and a^{11} . It is desirable to spread these two lines of ports for another reason also,—namely, in order that convenient space may be obtained in the valve bar, B, for the diverging ducts, b^5 , which are necessary to connect the ports of series b^1 with those of series b^2 . For bringing into service the ducts of set A^2 , the valve bar is moved in the opposite direction, and one step of such movement brings the ports, b^2 , into registration with the ports, a^2 , thereby bringing into service for connection with the principal pneumatic action the 88 note-ducts constituting the middle portion of said narrow space set, A^2 .

The line of ports, a^{20} , is two steps back of the line of ports, a^2 , and by movement of the valve bar such two steps the ports, b^2 , of the board are brought into registration with the ports, a^{20} , to the extent of the 70 ports of that series, the remaining 18 ports of the series, b^2 , being closed against the blank face of the board, A, beyond the ends of the line of ports, a^{20} , and thereby the 70 middle ducts of set A^2 are brought into service for connection with the principal action. The same movement which effects this registration of the ports, b^2 , with the ports, a^{20} , brings the ports, b^{21} , into registration with the ports, a^{21} . The number of steps between the lines of the ports, a^{20} and a^{21} , is determined by the necessity of avoiding the registration of the ports, b^{21} , with the portion of the series a^2 , which overlaps the series a^{21} , in the board, A, being the ports for the nine ducts which are adapted for double service.

Considering the position of registration of the ports, b^{21} , with the ports, a^{21} , and of the ports, b^{20} , with the ports, a^{20} , it will be seen that this position has been reached by the reverse of movements as follows:—Counting back from the position of such registration,—two steps for registration of ports, b^2 , with ports, a^2 ; one step for position out of service; one step for registration of the ports, b^1 , with the ports, a^{11} ; two steps for registration of the ports, b^1 , with the ports, a^{10} ; two steps for registration of the ports, b^1 , with the ports, a^1 . In order therefore that none of these steps shall bring the line of ports, b^{21} , over the line of ports, a^2 , to the extent of their overlap on that line of ports, the distance between the two lines of ports, a^{21} , and a^2 , must be neither two steps, three steps, four steps, six steps or eight steps, these being the steps corresponding to the several positions of registration above mentioned. It is not desirable to locate two lines of ports a single step apart because thereby the difficulty of constructing the board and preserving the satisfactory septa between the ports is increased. The shortest distance apart of the two ports will therefore be seen to be five steps, and they are preferably so located, as shown in the draw-

ings. It will be seen that they could, if preferred, be seven steps apart. Since the ports, b^2 , register with the ports, a^{20} , at the same time that the ports, b^{21} , register with the ports, a^{21} , the distance between the ports, b^2 , and b^{21} , must be the same as the distance between the ports, a^{20} and a^{21} , and we have already seen that the ports, a^{20} , are two steps distant from the ports, a^2 , and they are therefore only three steps distant from the ports, a^{21} , and three steps is therefore the necessary distance between the ports, b^2 , and b^{21} , on the bar, B. It will be observed that upon the scales chosen the 58 ports of series, a^{11} , do not lap by the 23 ports at each end of the series a^{21} ; and it is therefore unnecessary to take into consideration the possibility of registering the lines of ports, b^{21} and a^{11} , at any subsequent position. As a matter of fact, however, a sufficiently wide spacing being made between the lines of ports, a^{11} and a^2 , and the corresponding ports, b^1 and b^2 , to accommodate the diverging ducts, b^5 , the entire range of movement of the bar will not bring the ports, b^{21} , as far forward as the line of ports, a^{11} .

Upon understanding the above described arrangement of ports and ducts in the duct bar, A, and valve bar, B, it will be seen that at a certain intermediate position of the bar on the board all the ports are closed and both sets of duct mouths, A^1 and A^2 , are out of service; and that by moving the bar one step forward 58 middle ducts of set A^1 are brought into service, all others still remaining closed; that by making another movement two steps, 65 middle ducts of set, A^1 , are brought into service, all other ducts still remaining closed; that by moving the bar two steps farther in the same direction, the entire number of ducts—88—of set A^1 , are brought into service, all ducts of set A^2 remaining closed; that, returning to the original position—out of service—and moving thence one step back, 88 middle ducts of set A^2 are brought into service in connection with the principal pneumatic action, all ducts of set A^1 and the remaining 28 ducts of set A^2 being closed; that by moving the bar back two steps farther 70 of the middle ducts of set A^2 are brought into service in connection with the principal action, and the remaining 46 ducts of set A^2 are brought into service in connection with the solo or melody action; all the ducts of set A^1 being closed.

A convenient means for adjusting the valve bar, B, to the several positions for the different uses described consists in mounting said bar on the board, A, between suitable guides, H, H, for guiding it in direct transverse movement, and providing it with springs, J, J, for holding it closely pressed against the bar, A, to prevent leakage at the ducts. On the bar, A, there is mounted a rock shaft, K, extending longitudinally thereof and

having two or more cranks, J^1 , J^1 , which are connected by links, L, L, with the valve bar, B, at points suitably separated longitudinally of the bar. By rocking the shaft it will be seen that the bar will be carried edgewise transversely of its width and of the width of the bar, A, and being thus engaged at two widely separated points in its length, and the movement at these points being substantially equal it will be free from liability to pivoting or cramping notwithstanding its length is so great relatively to its width in the direction of said movement. For rocking the shaft and indicating the different stopping points at which the valve bar ducts will effect the several registrations necessary for the different purposes, the rock-shaft, K, may be provided with an operating and index arm, J^2 , and the length of the cranks, J^1 , may be such that a movement of from 45 to 60 degrees will be sufficient to effect the entire throw of the valve bar for all the adjustments indicated. Alongside the path of the operating and index arm, J^2 , there is mounted a segment dial, M, on which are indicated the different positions at which the index arm should be set for the various purposes which are noted on the segment.

It will be noticed that in the board above described, the ducts from the two sets of mouths, A^1 and A^2 , are parallel, and that their ports in the face of the board are spaced substantially the same as the tracker mouths of the two sets, A^1 and A^2 , respectively. This is the easier method of constructing the duct board, but this necessitates the structure shown and above described, in which the valve bar has two 88-port series, b^1 and b^2 , for registration respectively with the ports of the ducts from the two sets of duct mouths, A^1 and A^2 , of the board. By converging the ducts from the set, A^1 , in the board so that the ports by which they open to the face of the board may be spaced the same as the ports of the set, A^2 , instead of being spaced the same as the tracker duct mouths from which they lead, it is rendered possible to dispense with the longer series of ports, b^1 , of the valve bar, and thereby dispense with the converging ducts, b^5 , of said bar, the ports, b^{22} , corresponding to the ports, b^2 , of the first construction, being extended directly through the valve bar for connection with the flexible tubes, C. This modified structure is shown in Figs. 13, 14 and 15.

I claim:—

1. In an automatic music-playing instrument, a duct board having a set of ducts all leading to ports at the same surface of the board, all of said ducts having one port at said surface, a portion of them having only one such port, all the remainder having two such ports, and a portion of said remainder

having three such ports whereby there are formed three series of ports, the first comprising ports of all the ducts, the second comprising ports of a portion of the ducts
 5 and the third comprising ports of a lesser portion, each of said series occupying a distinct portion of the area of the board's surface, all said series having their ports spaced on the same scale; a valve bar having
 10 a series of ports spaced on the scale of the ports of the duct board and equal in number and pertaining to the full number of such ports, and means for adjusting said valve bar to register its ports with those of
 15 either one of the three series of ports of the duct board at will.

2. In an automatic music-playing instrument, in combination with a duct board having two sets of ducts, and ports from both
 20 said sets in the same surface of the board, said two sets comprising respectively different numbers of ducts, the greater set having a portion of its ducts provided with two ports each, forming two series of ports in
 25 the same surface of the board; a valve bar having two series of flexible tubes connected with it; ports from one of said series adapted at one position of the valve bar to connect said tubes with the ports of the ducts
 30 of the lesser set, and at another position to connect them with one of the two series of ports of the greater set, the ports from the other series of tubes being adapted at said last mentioned position to register with ports
 35 from all the remaining ducts of the first set.

3. In an automatic music-playing instrument, in combination with a duct board having two sets of ducts of different number leading to ports all in the same surface of
 40 the board, the set which has the greater number having a portion of its ducts provided with two ports each in a first and second series, and having another portion provided with two ports each, one in said first series and constituting a continuation of
 45 said series, and the other in a third series, the remainder of the ducts of said larger set having their ports all in said third series; a valve bar having two sets of flexible tubes connected with it leading from two series of
 50 ports in the face of said valve bar, one of said sets being in number equal to, and the ports to which they lead being adapted to register with, said first series of ports of the duct board, the other set being equal in
 55 number to and connected with ports adapted to register with the ports of the third series of the duct board, the two series of ports of the valve bar to which said two sets of ducts are connected respectively being spaced from
 60 each other a distance equal to the spacing of the second and third series of ports of the board for registering simultaneously with said second and third series.

65 4. In an automatic music-playing instru-

ment, in combination, a duct board having two sets of ducts of different number and differently spaced, each occupying approximately the same extent lengthwise of the
 board, the ducts of both sets having ports
 70 leading to the same surface of the board; a valve bar having flexible tubes connected with it at one face and communicating with ports in another face, a portion of the ducts of both sets in the duct board having two
 75 ports constituting separate series of ports occupying each a distinct area in the same surface of the board, the board having an unported area intermediate the areas of the several series of ports pertaining to the two
 80 sets of ducts respectively, the ports of the valve bar being adapted to seat at such unported area for closing all the ports of the valve bar, and having its ports arranged for registration with the different series of ports
 85 of one set of ducts by movement in one direction from said unported area, and for registration with the several series of ports of the other set of ducts by movement in the opposite direction from said area, and means
 90 for so moving the valve bar.

5. In an automatic music-playing instrument, in combination with a duct board having two sets of ducts of different number and differently spaced, leading to ports all
 95 upon the same surface of the board, the series of ports pertaining to said sets of ducts respectively being differently spaced on said surface of the board, each series occupying a distinct area of said surface; a
 100 valve bar mounted for movement on the duct board having flexible ducts communicating with it at one face and through it to two sets of ports in another face, the spacing of the series of ports of one of said sets of the valve
 105 bar agreeing with that of the series of ports of one of the two sets of ducts of the duct board, and the spacing of the series of ports of the other set in the valve bar agreeing with that of the series of ports of the other
 110 set of ducts of the duct board, the distance between said two series of ports of the valve bar being different from the distance between said corresponding series of duct board ports.
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6. In an automatic music-playing instrument, in combination with a duct board having two sets of ducts of different number and differently spaced, and ports therefor all in the same surface of the board, the set
 120 of ducts which has the greater number having a middle group equal in number to the total number of the other set provided each with two ports, said ports comprising three series, the first series comprising one port of
 125 each of said entire number of doubly ported ducts, the second series comprising the other ports of a middle portion of said doubly ported ducts, and the third series comprising the remainder of the ports at both ends of
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said group of doubly ported ducts, the remaining ducts of said larger set having each a single port, such ports constituting a continuation of said third series at the opposite ends thereof; a valve bar having two sets of flexible tubes for connection with separate pneumatic actions, one set equaling and pertaining to the total number of ducts of said lesser set of duct board ducts, the other set equaling and pertaining to the full number of ports of said third series including said remainder of said larger set of duct board ports, said valve bar having two series of ports connected with the first mentioned set of tubes, one of said two series adapted to register with the duct board ports of the lesser set of ducts, and the other of said two series adapted to register with the first of said three series of duct board ports pertaining to the set of ducts having the greater number, the other set of tubes being connected with ports in the valve bar adapted to register with said third series including said remainder of said large set of duct board ports and spaced from the first of said two series for simultaneous registration of said series respectively with said second and third series of valve board ports.

7. In an automatic music-playing instrument, in combination with a tracker board having two sets of tracker ducts leading respectively to two series of ports at the same surface of the board; a valve bar mounted for movement on the duct board having two sets of apertures extending independently therethrough, corresponding respectively to the two series of tracker board ports and adapted at one face of the bar to register with such series respectively, the distance between said two sets of apertures of the valve bar at said face being different from the distance between said corresponding series of duct board ports, said apertures being positioned at said face of the bar for registration of only one set of apertures at a time with its corresponding series of tracker board ports.

8. In an automatic music-playing instrument in combination with a tracker board having two sets of tracker ducts leading respectively to two series of ports at the same surface of the board; a valve bar mounted for movement on the duct board having two sets of apertures extending independently therethrough, corresponding respectively to the two series of tracker board ports and adapted at one face of the bar to register with such series respectively, the distance between said two sets of apertures of the valve bar at said face being different from the distance between said corresponding series of duct board ports, said apertures being positioned at said face of the bar for registration of only one set of apertures at a time with its corresponding series of tracker

board ports, and means for adjusting the valve bar transversely with respect to the direction of said series of ports to shift the registration.

9. In an automatic music-playing instrument, in combination with a tracker board having two sets of tracker ducts leading respectively to two series of ports at the same surface of the board; a valve bar mounted for movement on the duct board having two sets of apertures extending independently therethrough respectively corresponding to and adapted to register with the two series of tracker board ports, said apertures being positioned at one face of the bar for registration of only one set of apertures at a time with its corresponding series of tracker board ports, and means for adjusting the valve bar to shift registration.

10. In an automatic music-playing instrument in combination with a fixed duct board having two sets of ducts of different number and differently spaced, leading to ports all upon the same surface of the board; the series of ports pertaining to said sets of ducts respectively being differently spaced on said surface of the board, each series occupying a distinct area of said surface; a movable bar having flexible tubes communicating with it at one face and through it to two sets of ports in another face, the spacing of the series of ports of one of said sets of the bar agreeing with that of the series of ports of one of the two sets of ducts of the duct board, and the spacing of the series of ports of the other set in the valve bar agreeing with that of the series of ports of the other set of ducts of the duct board, the distance between said two series of ports of the bar being different from the distance between said corresponding series of duct board ports.

11. In an automatic music-playing instrument in combination with a tracker board having two sets of tracker ducts leading respectively to two series of ports at the same surface of the board; a device having two sets of apertures extending independently therethrough, corresponding respectively to the two series of tracker board ports and adapted at one face of the bar to register with such series respectively, the distance between said two sets of apertures of the device at said face being different from the distance between said corresponding series of duct board ports, said apertures being positioned at said face of the device for registration of only one set of apertures at a time with its corresponding series of tracker board ports, and means for adjusting said device transversely with respect to the direction of said series of ports to shift the registration.

12. In an automatic music-playing instrument, in combination with a tracker device

comprising a duct board having a set of
ducts in three groups, all emerging through
the same surface of the board in rows, one
group having only one mouth, a second
5 group having two mouths, of which one is
situated in the row of mouths of the first
group and the other out of such row, and the
third group having two mouths, of which one
is situated in line with the row of the last-
10 mentioned mouths of the second group, and
the other is out of line with both rows of
mouths of the second group, and a valve bar
mounted for movement on the duct bar
having two sets of apertures extending inde-
15 pendently therethrough, one set correspond-
ing in number and in position longitudi-
nally of the bar with the ports of the first
group and the first-mentioned ports of the
second group, and the second corresponding
20 in number and position with the last-men-
tioned ports of the third group.

13. In an automatic music-playing instru-
ment, in combination with a tracker device
comprising a duct board having a set of

ducts all emerging through the same surface 25
of the board in two rows of ports out of
alinement with each other and a valve bar
mounted in contact with said surface of the
duct board having two sets of apertures ex- 30
tending independently through it and emerg-
ing respectively at its surface in contact with
the duct board in two rows of ports spaced
for registration respectively simultaneously
with the two rows of duct board ports; two 35
sets of flexible tubes connected with the re-
spective rows of apertures in the valve bar,
and independent pneumatic actions to which
said ducts from the two rows respectively
extend.

In testimony whereof, I have hereunto 40
set my hand, in the presence of two wit-
nesses, at Chicago, Illinois, this 14th day of
June, 1907.

CHAS. S. BURTON.

In the presence of—

J. S. ABBOTT,

M. GERTRUDE ADY.