No. 715,693. Patented Dec. 9, 1902.

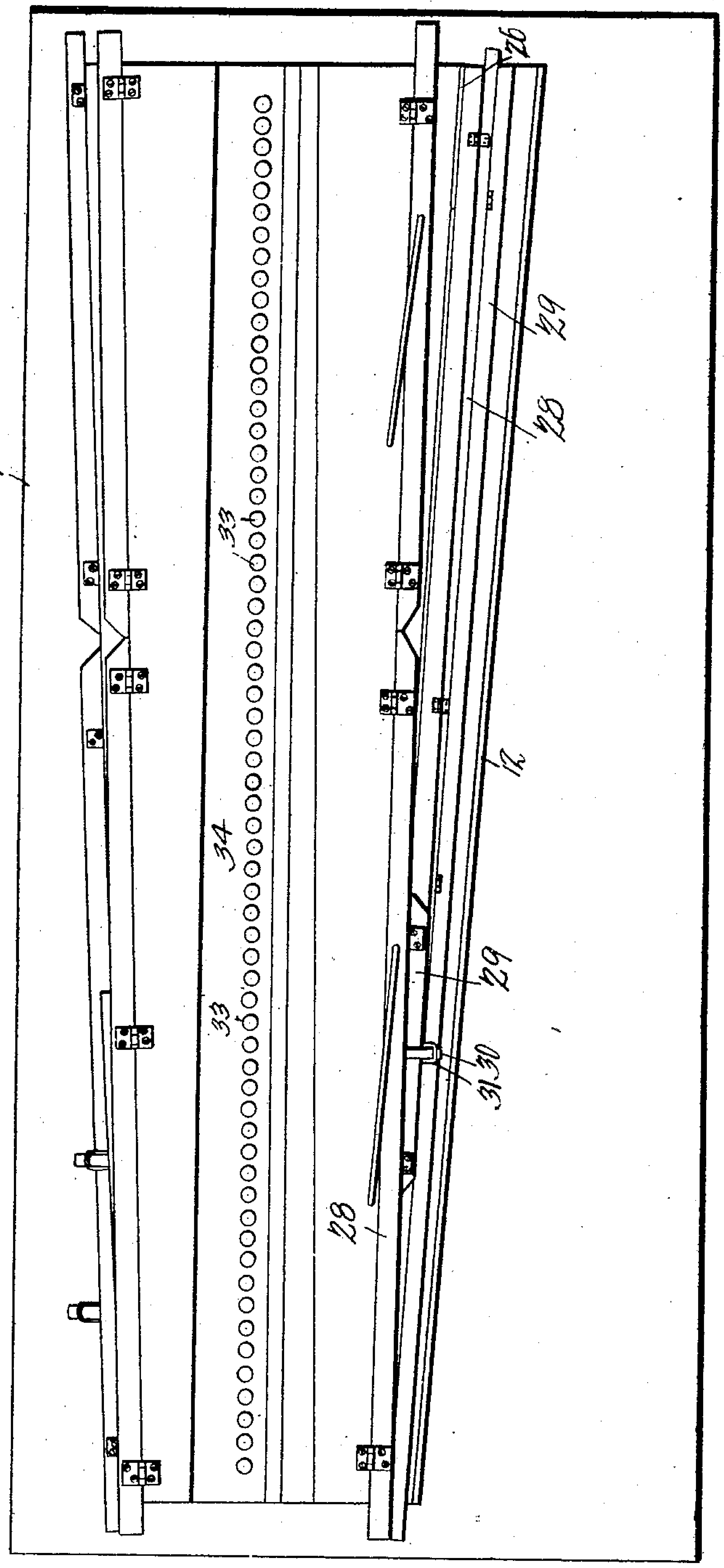
P. C. PRESTON.

REED ORGAN.

(Application filed July 3, 1902.)

(No Model.) 5 Sheets—Sheet 1.

Fig. I.



Witnesses

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by C. A. Snow & Co. Attorneys

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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Fig. 2.

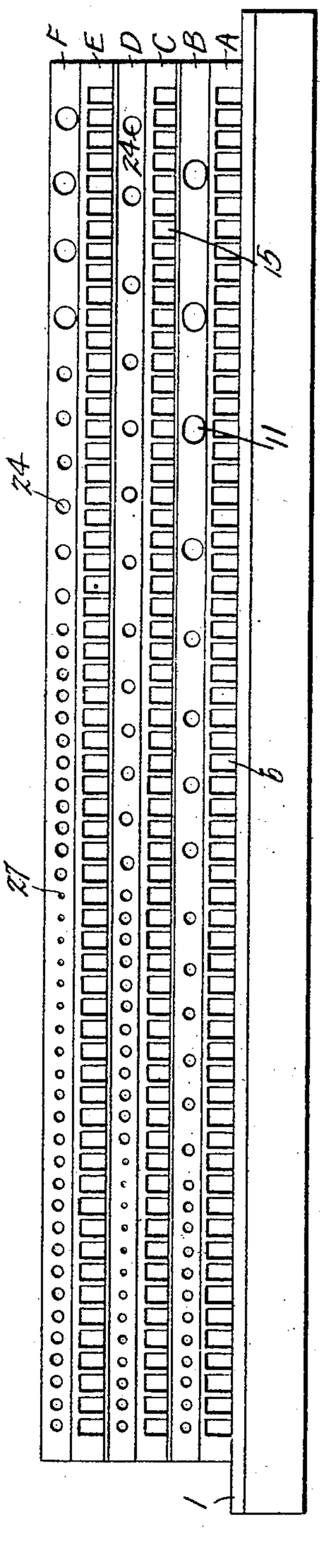
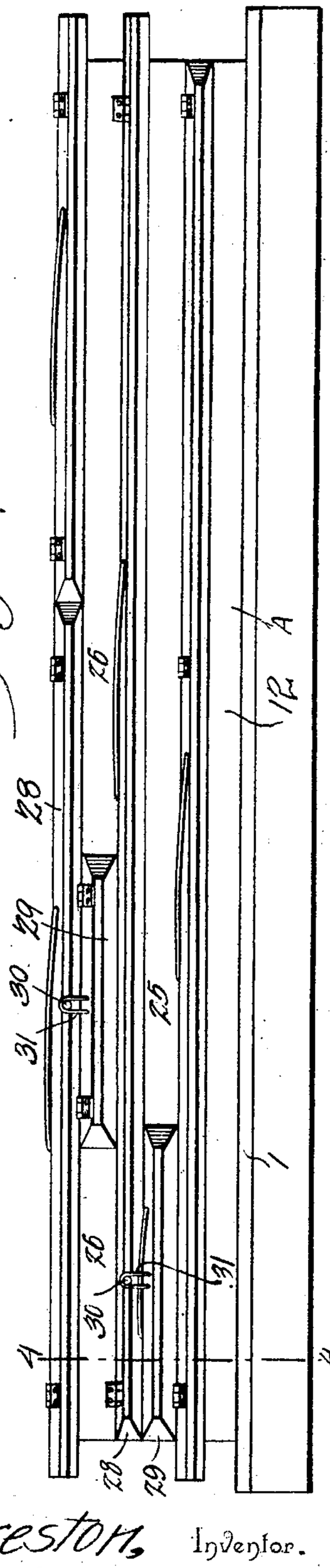


Fig. 3.



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5 Sheets—Sheet 3.

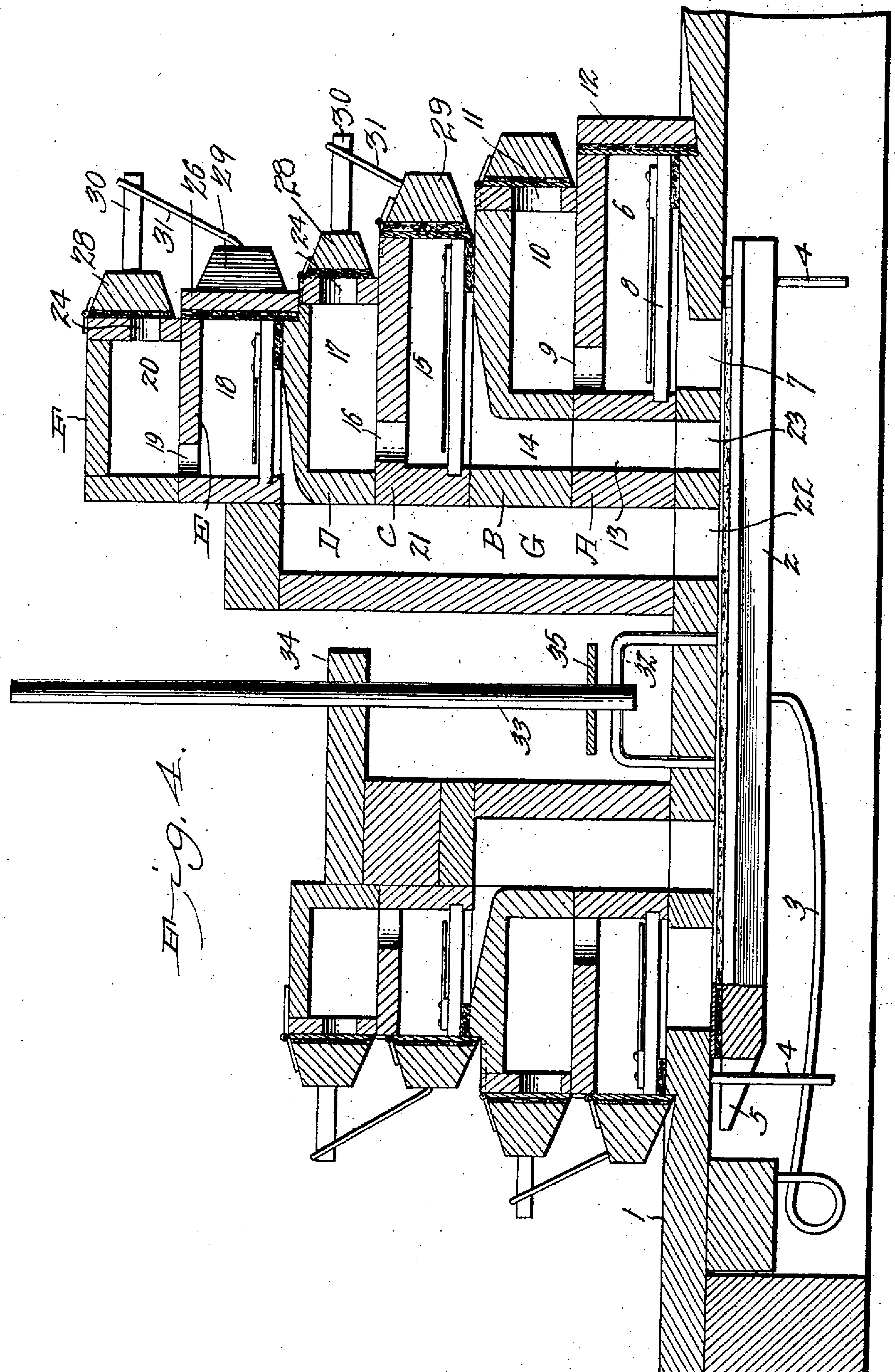

Fig. 4.

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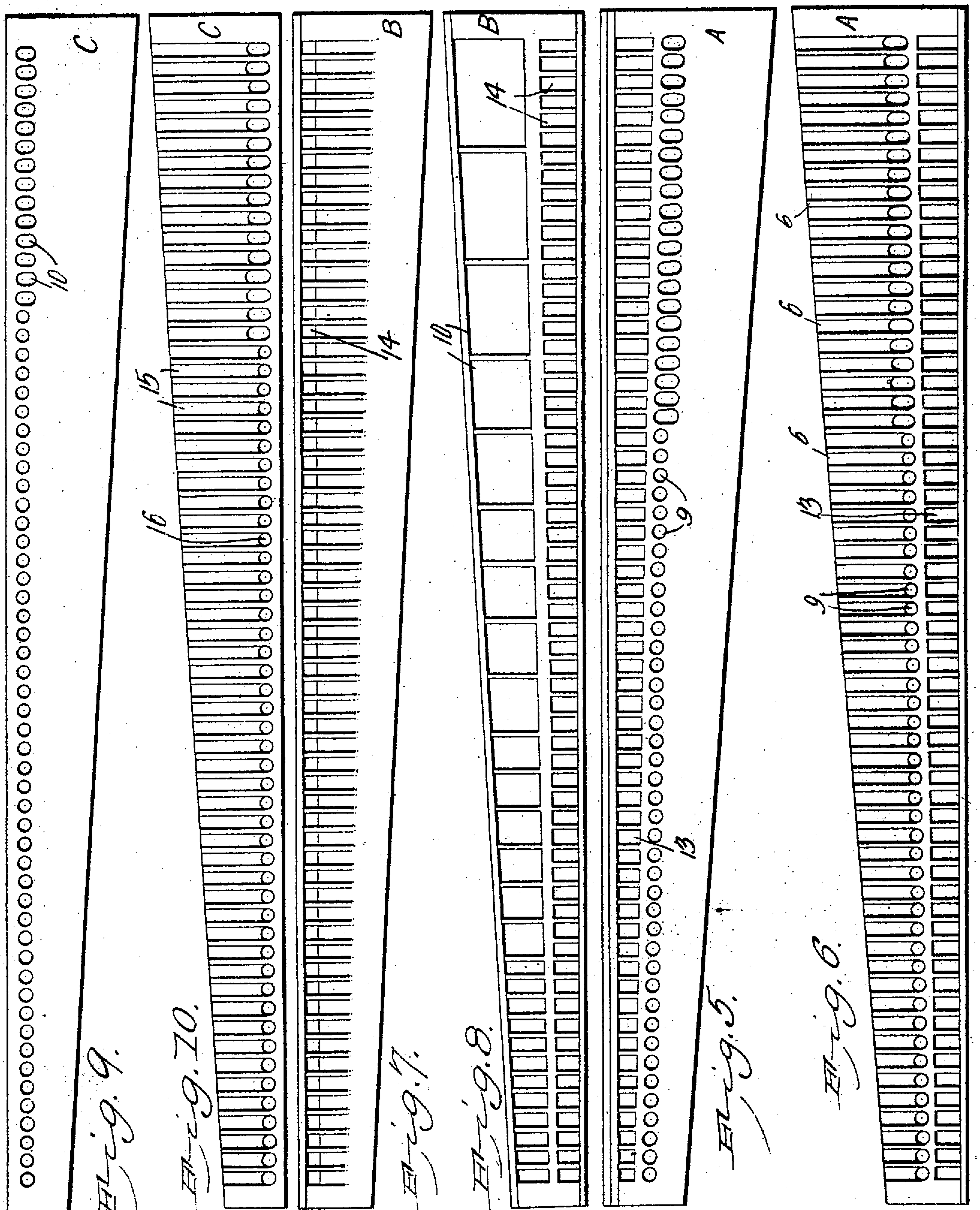
(No Model.) 5 Sheets—Sheet 4.



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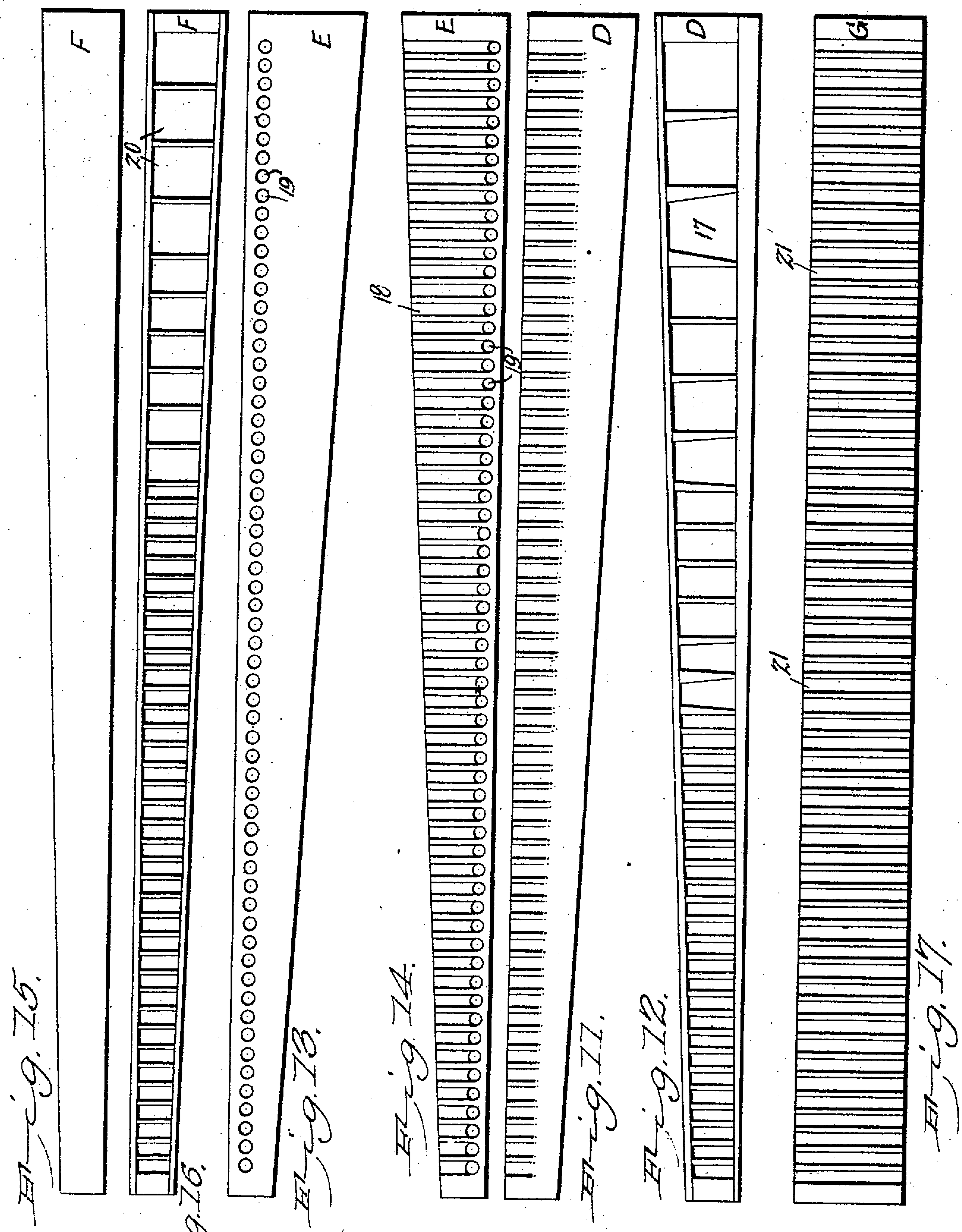
(No Model.) | 5 Sheets—Sheet 5.



Witnesses

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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

PERCY C. PRESTON, OF DENISON, TEXAS.

REED-ORGAN.

SPECIFICATION forming part of Letters Patent No. 715,693, dated December 9, 1902.

Application filed July 3, 1902. Serial No. 114,302. (No model.)

To all whom it may concern:

Be it known that I, PERCY C. PRESTON, a citizen of the United States, residing at Denison, in the county of Grayson and State of Texas, have invented a new and useful Reed-Organ, of which the following is a specification.

The invention relates to reed-organs, and particularly to reed-board construction, the object in view being to improve the quality and volume of the tone, produce a uniform pipe-tone throughout the different registers and irrespective of the pitch thereof, and also to provide such a construction and arrangement of parts as to adapt a single series of pallets on the wind-board to control any desired number of registers and insure the prompt, full, and simultaneous speaking of the reeds in all of the registers in use.

Further objects and advantages of this invention will appear in the following description, and the novel features thereof will be particularly pointed out in the appended claims, and it will be understood that various changes in the form, proportion, and the minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of this invention.

In the drawings, Figure 1 is a top plan view of a reed-board constructed in accordance with the invention. Fig. 2 is a front view of the same with all mutes omitted. Fig. 3 is a similar view showing the mutes in place. Fig. 4 is an enlarged transverse sectional view of the reed-board. Figs. 5 and 6 are respectively top and bottom plan views of the lowermost reed-board A. Figs. 7 and 8 are similar views, respectively, of the lowermost pipe-board B. Figs. 9 and 10 are similar views, respectively, of the reed-board C. Figs. 11 and 12 are similar views of the pipe-board D. Figs. 13 and 14 are similar views of the reed-board E. Figs. 15 and 16 are similar views of the pipe-board F. Fig. 17 is an inside view of the flue-board G.

Similar reference characters indicate corresponding parts in all the figures of the drawings.

The wind-board 1 is provided with series of openings, the number of series employed corresponding with the number of registers and being variable to suit the capacity of the instrument to be constructed, five series being illustrated in the drawings. The corresponding openings in all of the series are arranged on common lines transverse to the series and are controlled by common pallets 2, having the pallet-actuating springs 3 operatively related therewith, each pallet being provided with guides, such as the usual pins 4, with which engage the slits 5 in the ends of the pallet.

Communicating with each series of pallet-openings is a series of reed-cells, and in communication with each reed-cell of a series is a resonance or pipe cell, designed to increase the column of air affected by the vibrations of the reed-tongues, and in order to provide for compactness of arrangement, whereby any desired number of registers may be employed in the same organ of small capacity, and at the same time in order to provide for the control of the different registers, so that the same may be used separately or in any desired combinations, the reed-cells are arranged in horizontal series one above the other, the series of resonance or pipe cells are arranged in horizontal series, respectively, above the series of reed-cells with which they communicate, and each reed-cell is in communication by a separate wind-passage with its corresponding pallet-opening in the wind-board. Any desired number of sets of reed and pipe cells may be employed on a given wind-board; but for the purpose of illustration it has been deemed sufficient to illustrate only two sets in the drawings. One of these sets consists of three registers adapted, respectively, for reeds of sixteen-foot, eight-foot, and four-foot tones, while the other illustrated set consists of two registers adapted, respectively, for reeds of eight-foot and four-foot tones. As the number of sets may be varied at will and as the construction of each is similar to the others, it will be necessary in this connection to specifically describe but one, and for the purpose of illustration particular reference will be made to the set comprising three registers, although it will be understood that the set may embody a greater or less number of registers without varying the essential features of construction.

Immediately surmounting the wind-board

is a reed-board A, provided in its under side with graduated channels or recesses forming reed-cells 6, which are respectively in communication near one end with the graduated pallet-openings 7 in the wind-board. This reed-board is also provided in communication, respectively, with the reed-cells and at the extreme ends of said cells over the free ends of the tongues of the reeds 8 with graduated openings 9, whereby communication is established between the reed-cells and the graduated or resonance pipe cells 10, formed by recesses in the under side of the pipe-board B. These pipe-cells are in open communication with the outside air by means of graduated air-inlet openings or ports 11, which in the construction illustrated are shown in the front walls of the cells, although it will be understood that whereas it is preferable to provide these inlet-openings in communication with the pipe-cells at points remote from the communicating openings 9 it is not indispensable that they shall be formed in the front walls; but, on the other hand, when the register is not covered by a superposed register these inlet-openings may be formed in the top wall. The reed-cells are also open at their front ends for the introduction and removal of the reeds; but the reed-seats are constructed to entirely receive the reeds, and thus provide the reed-board with a flush face adapted to receive a permanent mute strip 12, which, however, is removable to give access to the reed-cells. The reed-board is also provided out of communication with the reed-cells with openings 13, which register, respectively, with openings in the pipe-board B, said openings 14 being out of communication with the pipe-cells and being in turn in communication with reed-cells 15 in the reed-board C, which surmounts the pipe-board B, and formed in the reed-board C, in communication, respectively, with the reed-cells thereof, are openings 16, whereby communication is established, respectively, between the reed-cells 15 and the pipe-cells 17, formed by recesses or cavities in the under side of the pipe-board D, which surmounts the reed-board C. In turn surmounting the pipe-board D is a reed-board E, having reed-cells 18 and also having openings 19, respectively in communication with said reed-cells and also in communication with pipe-cells 20 in the pipe-board F, which surmounts the reed-board E.

Secured to the back of the boards A, B, C, D, and E is a flue-board G, provided with a series of graduated flues 21, which are in communication at their lower ends, respectively, with pallet-openings 22 in the wind-board and are in communication at their upper ends, respectively, with the reed-cells 18 of the reed-board E. Thus it will be seen that the reed-cells of the lowermost register are in communication, respectively, with the pallet-openings 7 in the wind-board. The reed-cells 15 in the superposed register C are respectively in communication through the openings 14 in the pipe-board B and the openings 13 in the reed-board A with the pallet-openings 23 in the wind-board, and the reed-cells 18 in the uppermost register are in communication through the flues or wind-passages 21 with the pallet-openings 22 in the wind-board. The pallet-openings in the wind-board are graduated uniformly from one end of the register to the other, and correspondingly the reed-cells are graduated in size in all of the registers, the graduation being uniform from one end to the other. In the same way the communicating openings whereby each reed-cell is connected with a pipe-cell are graduated uniformly from one end of the register to the other. Moreover, the pipe-cells are graduated from one end of a register to the other, and this graduation is preferably uniform; but in order to economize space it has been found undesirable to provide a pipe-cell for each reed-cell, and as the same result can be attained by increasing the width as well as the depth of the pipe-cells and arranging one pipe-cell to communicate with either one, two, or more of the reed-cells I provide the necessary volume of air without departing in shape or dimensions from the corresponding reed-board, and thus insure compactness of the structure. It should be noted, however, that each reed-cell communicates by a separate wind passage or opening with the pallet-opening in the wind-board, or, in other words, that the pallet-controlled openings in the wind-board communicate, respectively and directly, with the reed-cells. This is in order to avoid false speaking, which is a disadvantage of those constructions involving the use of a pallet-opening which is common to two or more reeds in different registers. The fact that the registers are provided, respectively, with controlling-mutes does not avoid this difficulty.

As before indicated, each pipe-cell in register B is provided with an inlet opening or port 11, one port being employed for each cell, and these ports are graduated from one end of the register to the other. In the superposed register the pipe-cells are similarly provided with ports 24, which are also graduated in size; but the ports in this register are not uniformly graduated, as it has been found that to preserve a uniform graduation of the ports of an eight-foot register, even in a five-octave organ, will not preserve a uniform pipe tone throughout the register. In fact, if the sixteen-foot-tone register is carried beyond the five-octave length the uniform graduation of the pipe-cell ports must be broken, whereas within the limits of the ordinary five-octave register the uniform graduation of the ports may be preserved, and the ports may form the sole means for the inlet of air to the reed-cells, the reed-cells not being directly in communication with the outside air, but being supplied solely through the pipe-cells and their ports. In

the eight-foot-tone register the "break" in the uniform graduation of the pipe-cell ports occurs about at the degree F, second above middle C, although it varies a distance of a note or two on one side or the other, according to the general pitch of the organ. Up to this break in the eight-foot-tone register the reed-cells are permanently closed by a strip 25, similar to the strip employed to close the reed-cells of the lower register; but at this point the strip terminates, and for an octave the reed-cells are open, whereas a very much reduced size of pipe-cell port is employed, beginning with a pin-hole opening, for instance, on the degree F, the ports being graduated or increased in size successively through this "open" octave. It has been found that if this open octave is not employed at this point the pipe-tone will be lost. Moreover, it has been found that unless the reed-cells are closed below this octave and also above this octave, so that they are fed slowly through the pipe-cells, the pipe-tone will be destroyed or will be apparent only for a distance not exceeding two or three octaves. Above this open octave in the eight-foot-tone register and also in any higher register, such as the four-foot-tone or two-foot-tone register, the reed-cells must be closed, although the exact note or degree at which the closing of the reed-cells commences may be varied a note or two above or below the degree F. Referring to the upper or four-foot tone register, it will be noted that the reed-cells are closed by the strips 26 below and above the open octave, and the pipe-cell of the lowermost degree of this open octave is provided with a pin-hole port 27, upward from which these ports are increased gradually in area, the closing of the reed-cells being resumed above the said open octave. Below this open octave the pipe-cell ports are graduated uniformly in size. Thus it will be seen that in order to preserve the pipe-tone, eliminating the reed-tone, and insure a uniformity of tone throughout a register of five or more octaves it is necessary to graduate not only the wind-board or pallet openings and the reed-cells, but also the pipe-cells, and also to graduate the pipe-cell ports, all of which are open from one end of each register to the other, to vary or break the graduation of these ports at a certain pitch in the register corresponding approximately to the degree F second above middle C in the eight-foot-tone register, and also to maintain the reed-cells closed throughout each register, except for approximately one octave between approximately the degree F second above middle C of the eight-foot-tone register, the ports of the pipe-cells corresponding to that open octave being very much reduced in size and the reed-cells of said open octave being in open communication with the outside air. It has been found by experiment, however, that these pipe-cell ports of the open octave perform an important function, that the pipe-tone will not be obtained if these reduced pipe-cell ports or any of them are closed, and that if the areas of the pipe-cells are properly graduated throughout this open octave, so as to preserve the pipe-tone, the closing of a pipe-cell port, even when it consists merely of a pin-hole, will actually check or stop the vibration of the reed. The mutes which are employed for the control, respectively, of the different registers must be so constructed, therefore, as to close the normally open pipe-cell ports and also the open reed-cells, and in practice the mutes are arranged in pairs connected for simultaneous operation by a draw-stop or its equivalent. In the construction illustrated each register is provided with coöperating mutes 28 and 29, which may be connected by means of pins 30 and loops 31, respectively carried by the mutes 28 and 29; but it will be understood that other means for connecting and causing simultaneous movement of the mute members may be employed. It will be understood, moreover, that whereas in the drawings there is illustrated a five-octave register this may be extended to any desired length without loss of the desirable pipe-tone, provided the open octave is located as described and provided the reed-cells remain permanently closed except through this open octave. Moreover, whereas the pipe-cell ports are graduated in area both above and below that point in the register which has been designated as the "break" in the series the increase in the area is in opposite directions. Starting with a pin-hole opening on the degree F above referred to the ports increase in area upward or in ascending the register, the diameter of the port at the upper end of the open octave being approximately one-eighth of an inch, whereas below this point of break the increase in area of the pipe-cell ports is downward or in descending the register, although it has been found that the best results are obtained by preserving an approximately uniform area of the pipe-cell ports for approximately one octave below the open octave, and then more abruptly increasing the difference in area between successive ports, while preserving a uniformity of increase. Thus while the pipe-cell ports are graduated throughout the register they increase in area, respectively, in ascending and descending from an intermediate point, although the increase is not from a common size as a starting-point. The lowest degree of the open octave is provided with a pin-hole port, from which the ports increase in size successively, whereas the uppermost degree of the adjoining "closed" octave is provided with a pipe-cell port which is approximately a quarter of an inch in diameter. It will be understood also that the arrangement of wind-passages in communication with the pallet-openings in the wind-board is such as to provide for banking the registers or arranging any desired number thereof in a set.

In order that the prompt speaking of the various registers in the organ may be at-

tained, each pallet is provided with a yoke 32, of which the arms extend through guide-openings in the wind-board and bear on the pallet at opposite sides of the point of contact of the pallet-spring therewith, and in contact with each valve-opening yoke is a tracker-pin 33, bifurcated to straddle the closed end of the yoke and mounted in suitable guides 34 and 35, these tracker-pins being actuated, as in the usual practice, by means of the keys, which it is deemed unnecessary to illustrate.

Having described the invention, what is claimed is—

1. A reed-board having reed-cells, and pipe-cells communicating with the reed-cells and provided with graduated ports which are increased successively in area in opposite directions from an intermediate point of the register.

2. A reed-board having reed-cells and communicating pipe-cells provided with ports, those ports upward from an intermediate point of the register being increased successively in area, and those ports downward from an intermediate point of the register being increased successively in area.

3. A reed-board having reed-cells and communicating pipe-cells provided with ports, a series of the ports at an intermediate point of the register being approximately of uniform area, those ports below said series increasing successively in area toward the lower end of the register, and those ports above said series being increased successively in area toward the upper end of the register.

4. A reed-board having reed-cells and communicating pipe-cells provided with ports, those ports below an intermediate point of the register being increased successively in area toward the lower end of the register, and those ports above said intermediate point being increased successively in area toward the upper end of the register, the initial ports of the two series being of different areas.

5. A reed-board having reed-cells and pipe-cells provided with series of ports increasing successively in area toward the remote ends of the register.

6. A reed-board having reed-cells and communicating pipe-cells provided with series of ports increasing successively in area toward opposite ends of the register, the adjacent initial ports of the series being of different areas.

7. A reed-board having reed-cells and communicating pipe-cells provided with series of graduated ports increasing successively in area toward opposite ends of the register, and series of the reed-cells corresponding with the pipe-cells of a portion of the register being open.

8. A reed-board having reed-cells and communicating pipe-cells provided with series of graduated ports increasing successively in area toward opposite ends of the register, the initial ports of the series being of different areas, and the reed-cells corresponding with the pipe-cell ports of a portion of the upper series being open.

9. A reed-board having reed-cells and communicating pipe-cells provided with series of graduated ports increasing successively in area toward opposite ends of the register, the initial ports of the series being of different areas, and the reed-cells corresponding with the pipe-cell ports of the lowermost portion of the upper series being open.

10. A reed-board having reed-cells and communicating pipe-cells provided with series of graduated ports increasing in area successively toward opposite ends of the register, the reed-cells corresponding with the reed-cell ports of the lower or downwardly-increasing series being closed, the reed-cells corresponding with the lowermost portion of the upper series of reed-cell ports being open, and the reed-cells corresponding with the upper portion of the upper series of ports being closed.

11. A reed-board having reed-cells, a plurality of which are open to the atmosphere, and pipe-cells, communicating with the reed-cells and provided with ports open to the atmosphere, and mutes respectively closing the pipe-cell ports and the open-reed cells, and connected for simultaneous operation.

12. A reed-board having a plurality of registers and separate series of pallet-openings for the reed-cells of the different registers, common pallets for the corresponding pallet-openings of the several registers, looped yokes having their arms mounted in fixed guides and bearing terminally on the pallets at opposite sides of an intermediate point, and means for actuating the yokes.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

PERCY C. PRESTON.

Witnesses:
C. E. DOYLE,
FRANK S. APPLEMAN.