

Alley & Poole,

Organ Action,

N^o 6,565

Patented July 3, 1849.

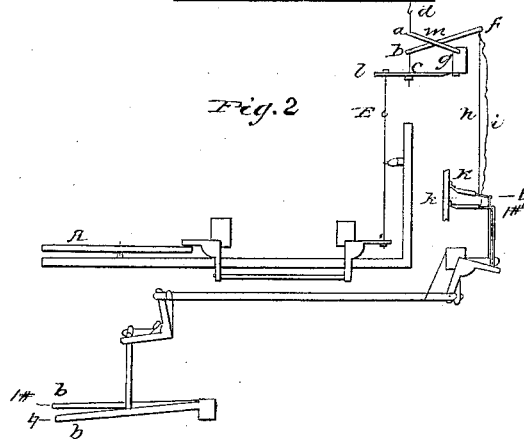
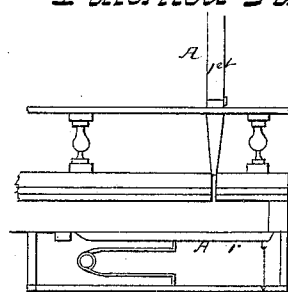
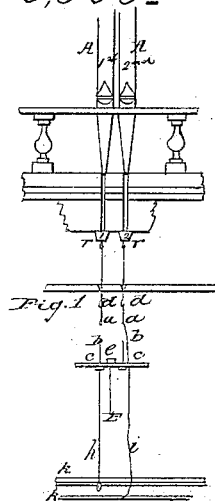


Fig. 3.

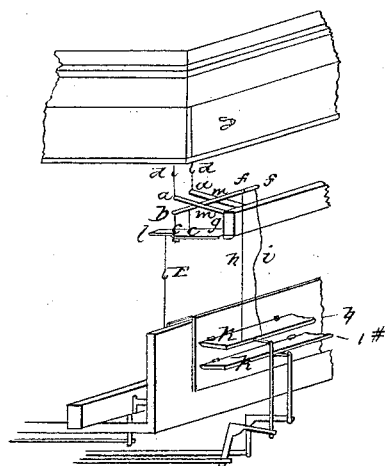
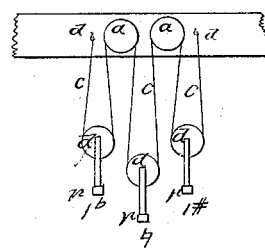


Fig. 4.



UNITED STATES PATENT OFFICE.

JO. ALLEY, OF NEWBURYPORT, AND H. W. POOLE, OF WORCESTER, MASSACHUSETTS.

KEYED MUSICAL INSTRUMENT.

Specification of Letters Patent No. 6,565, dated July 3, 1849.

To all whom it may concern:

Be it known that we, JOSEPH ALLEY, of Newburyport, county of Essex, State of Massachusetts, and HENRY W. POOLE, of Worcester, county of Worcester, State of Massachusetts, have invented certain new and useful mechanism by which all the sounds required by the laws of music can be given in perfection, (as to tune,) upon keyed instruments with fixed scales, as the organs, seraphines, and other instruments of that class, and by the twelve keys to the octave only,—called the Mechanism of the Euharmonic Organ, of which a full and exact description is given in the following specification and accompanying drawings.

The organ as at present constructed has been furnished with but twelve finger-keys and twelve sounds to the octave. But the laws of music require a much larger number of sounds than twelve within the limits in which the organ pretends to play. Consequently the common organ plays nothing correct, but gives all its harmony and melody in an imperfect manner. To remedy this defect, (in its tune,) is the object of our euharmonic organ. It is to give every chord it is intended to play not only nearer to perfection than the common organ but absolutely perfect. To do this it will have a larger number of pipes to the octave than twelve, while this increased number of pipes and valves will be operated by the common keyboard in the usual manner. Consequently one finger key will have to operate at different times on different valves and pipes.

The wind-chests are furnished with a sufficient number of valves and pipes to form any number of perfect diatonic scales, which it may be judged desirable to have introduced into the proposed instrument, and which are ascertained by the rules of music. The notes which compose the major diatonic scale are in their vibrations as these numbers, viz: 24, 27, 30, 32, 36, 40, 45, 48. To form other scales, or scales whose key-notes differ in pitch from each other it will be necessary to take a series of key notes, connected together by a series of perfect fifths; and to these keynotes the remaining notes of the scales must bear the same relation as do the numbers given in the scale above to its key note 24. The five keys which in each scale are not wanted to play the seven notes of the diatonic scale, may be used to play five notes which occur as accidentals; and

the twelve finger keys may give notes whose vibrations are as follows: 24, 26 $\frac{1}{2}$, 27, 28 $\frac{1}{2}$, 30, 32, 33 $\frac{1}{2}$, 36, 37 $\frac{1}{2}$, 40, 42, 45, [48]. The number of scales and of course of pipes which may be introduced is without limit. Next pedals are provided equal in number to the number of scales or keys to be played in. Each of these pedals when pressed will select out of the valves those wanted in a certain scale to which it is devoted, and attach them to the finger keys. At the same time it will draw up any other pedal which might be down at the time and detach from the keys all those valves which are not wanted in the required scale.

To explain the operation of one finger-key upon different valves, by moving different pedals, we give a description and drawings of, one method by which one finger key, A of the common key board can operate upon either of the valves A1st or A2nd.

Figure 1, represents a view of the work from the back, Fig. 2 a side view, and Fig. 3, a perspective.

The letters of reference are the same in each.

The tracker *e* is moved by the finger key A in the usual manner, and is fastened to a piece *l* movable on a hinge at its end. From this last extend to the valves A1st and A2nd the two divided trackers *cd*, *cd*. Were each of these in one piece the two valves would open whenever the tracker *e* was drawn down. But they are divided at *ab*, and the lower part *cb* can only be connected with the upper part *ad*, by the aid of what is called the connector, consisting of two levers *ag*, *bf*, riveted together at *m*. The end *g* is hung on a wire in the bar. The part of the tracker *bc*, is fastened to one lever at *b*, and the upper part to the other lever at *a*. The end *f* being free and movable there is as yet no connection between the divided trackers. The only effect produced by drawing down the tracker *e* is, that it will cause the lever *bf* to move upon its pivot, the end *f* rising as the other end *b* is drawn down. But should the end *f* by any means be held down so that it could not rise, the lever *bf* will act upon the lever *ag* so that it will draw down the tracker *ad* and open the valve. It remains to have this end *f* secured so that it cannot rise, at the time when it is required to have the key act upon the valve. This is accomplished by means of pieces of wood extending under all

the connectors, and called selectors. Two of these R, R, or those belonging to the scales of \natural (natural) and $1\sharp$ (one sharp) are shown. They move on hinges and are drawn down at will by pedal action. From the connector of $A1^{st}$ is fastened a cord by which it is attached to the \natural selector. Now if the \natural selector be drawn down and the finger key be pressed also, the $A1^{st}$ valve will open, and the $A2^{nd}$ will not. But the connector of the $A2^{nd}$ valve is in like manner joined to the $1\sharp$ selector by another line, so that if this be drawn down instead of the \natural one, $A2^{nd}$ will open instead of $A1^{st}$. When a pedal and selector is not down these lines will be slack as at i , permitting the ends f of the connectors to rise without opening the valves. We have explained the operation of two notes to one finger key and of two selectors only. But the number of valves to be played by the same key and the number of selectors and pedals may be increased at pleasure, the operation being the same as in the example given. Also, it may be stated, that there will be cords equal in number to the finger keys, which cords will be extended from each selector to those connectors which belong to the valves required in the scale to which the selector belongs.

As but one pedal and selector is to be down at once, the act of putting down a pedal will always draw up whatever one might be down at the time. In Fig. 4, are shown three pedals, or those belonging to the scales of \natural , \sharp , and $1\flat$, the \natural pedal being down. A cord *ccc* is passed about the fixed

pulleys *aa*, and the movable ones *bbb* which last are attached to the pedals *ppp*. The ends of the cord are attached to hooks at *dd*. Now if any other pedal than this \natural one be pressed, it must draw it up. And as the selectors were fastened to these pedals, they will rise and slacken their strings as at i whenever the pedals rise.

The main principle embraced in our invention consists in this: that a whole set of valves one to each finger key may be attached to the keys at once by one pedal and selector, and that there may be brought on by the same selector any desired combination of the valves contained in the organ. All of this is new, and was first invented and adopted by us.

To illustrate still further the operation of these selectors, the following table is given. It is supposed that an organ is constructed according to the scale given in the former part of this paper. The upper line shows the twelve finger-keys of the common key board marked by the names they are usually known by. The second line gives the names of the sounds which would be given by these keys with the \natural pedal down. The third, fourth, and fifth lines show the sounds which these same keys would give with the $1\sharp$, $4\sharp$, and $5\flat$ pedals respectively. The larger letters indicate the seven notes of each diatonic scale, and the smaller denote the five notes mentioned before which are brought on as accidentals. The figures attached to the letters are to distinguish different notes, which are usually represented in written music by the same letter.

Finger keys.	C	C \sharp	D	D \sharp	E	F	F \sharp	G	G \sharp	A	A \sharp	B
\natural	C2	D1	D2	D \sharp 1	E2	F2	F \sharp 2	G2	G \sharp 1	A2	B \flat 7	B2
$1\sharp$	C3	C \sharp 2	D2	D \sharp 1	E2	F7	F \sharp 2	G2	A2	A3	A \sharp 1	B2
$4\sharp$	B \sharp 1	C \sharp 2	D7	D \sharp 2	E3	F \sharp 2	F \sharp 3	F+1	G \sharp 2	A3	A \sharp 2	B3
$5\flat$	C1	D \flat 2	E \flat 1	E \flat 2	E1	F1	G \flat 2	G1	A \flat 2	A1	B \flat 1	C \flat 7

What we claim as our invention and desire to secure by Letters Patent is—

1. The selectors *h*, cords *h*, *i*, and connectors *ag* *bf*, combined with the valves *b* and the finger keys of the common key-board substantially in the manner and for the purposes set forth.

2. The so combining a system of pedals, equal in number to the number of keys or scales to be played in, with the mechanism by which each finger key is connected with the valve and pipe of the desired scale, that on putting down the pedal belonging to any scale, it shall at once attach to the finger keys usually employed in playing that scale upon the common organ, the valves of the

pipes truly belonging to it, the scale, and at the same time raise the pedal that was before down, and detach the valves which are not wanted.

3. The pedals *p* combined with the pulleys *aa* and *bb*, and with the selectors *h* in the manner and for the purpose set forth.

In witness whereof we have hereunto subscribed our names the twenty first day of April, eighteen hundred and forty nine.

JOSEPH ALLEY.
HENRY W. POOLE.

In presence of—
WILLIAM M. PEARSON,
OLIVER SPALDING.