2 Sheets--Sheet 1.

# N. S. BACH & M. P. BERG.

## Reed Organ.

No. 164,900. Patented June 29, 1875.

Fig. 1.

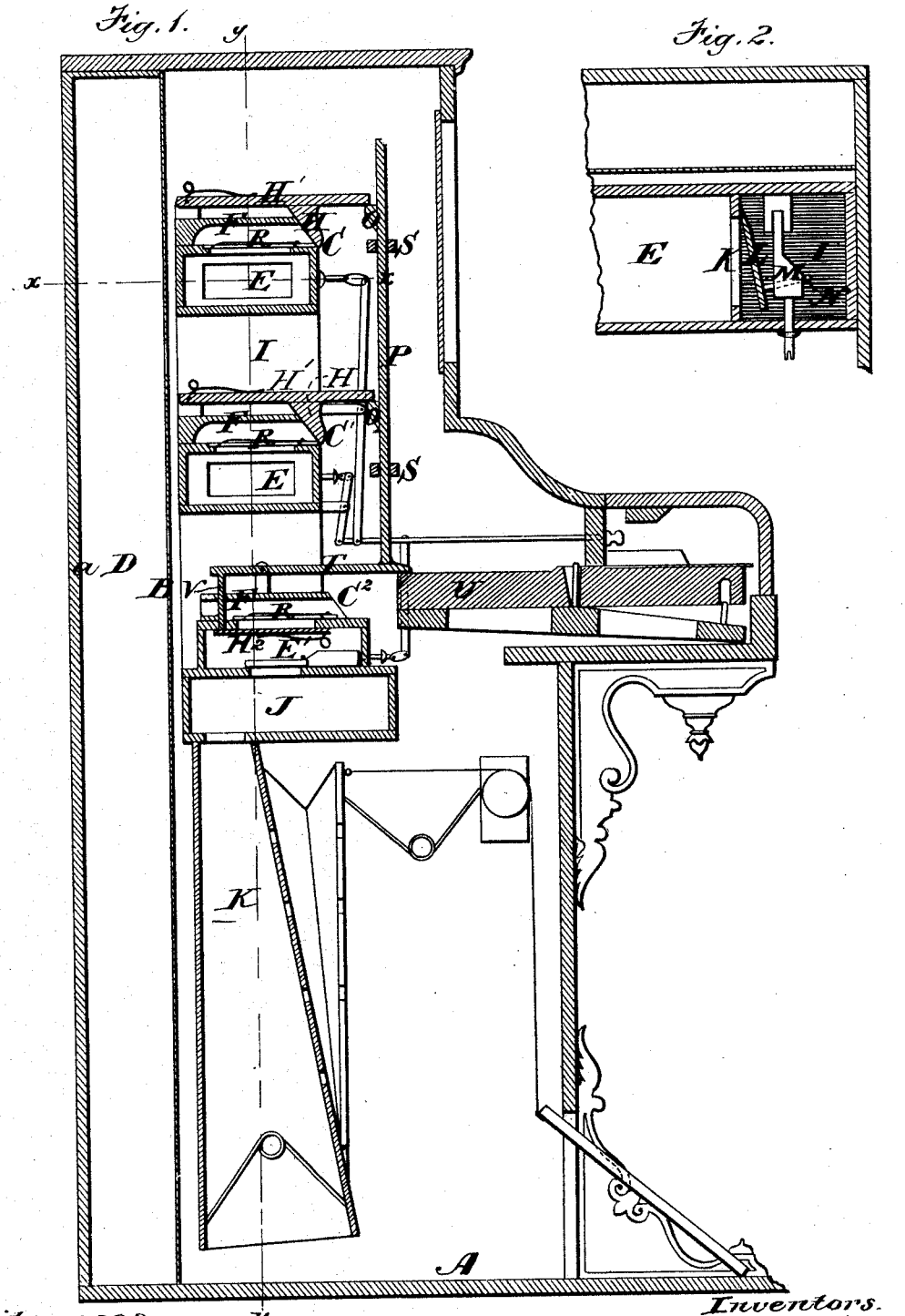



Fig. 2.




Witnesses.
Sam'l M. Barton.
A. E. Denison.

Inventors.
N. S. Bach.
M. P. Berg.
by their Attys.
C. D. Wright & Bro.

THE GRAPHIC CO. PHOTO-LITH. 39 & 41 PARK PLACE, N.Y.

2 Sheets--Sheet 2.

# N. S. BACH & M. P. BERG.

## Reed Organ.

No. 164,900. Patented June 29, 1875.

Fig. 3.

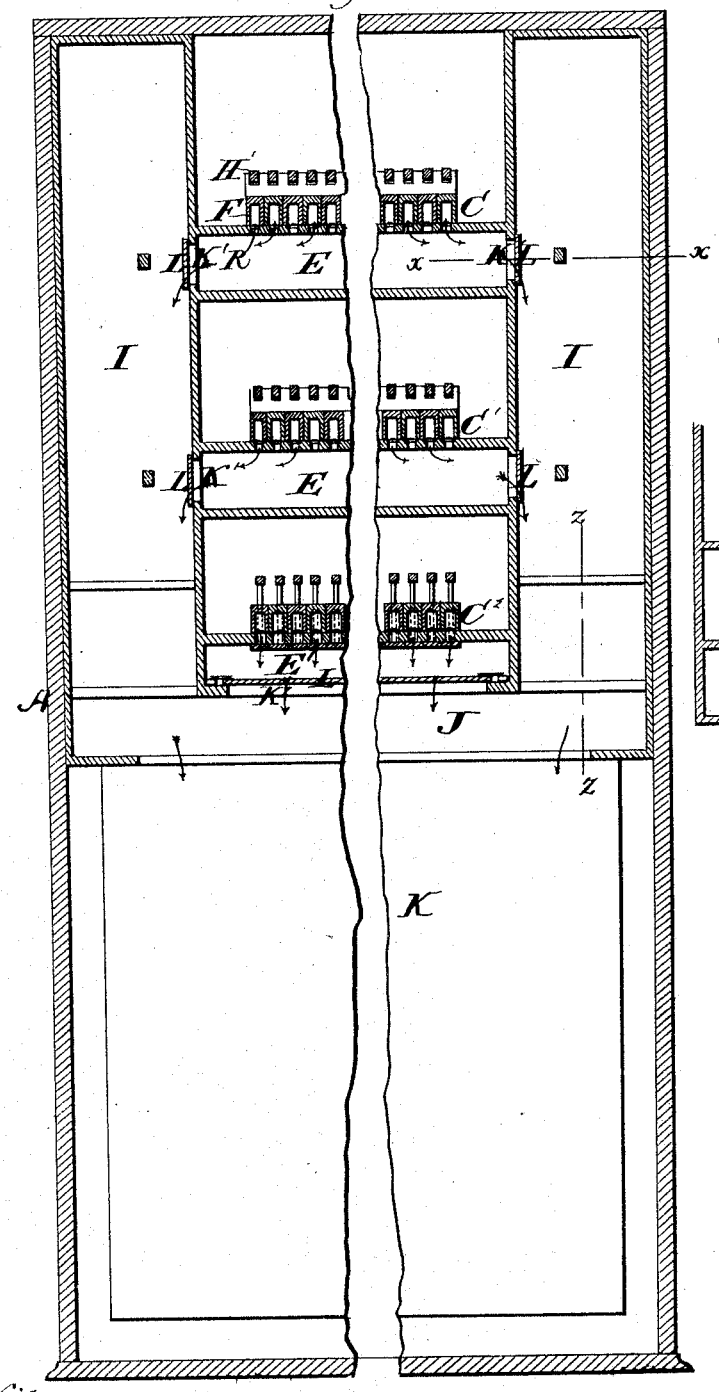
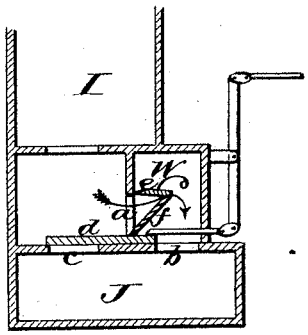



Fig. 4.




Witnesses.
Saml. M. Barton.
A. E. Denison

Inventors
N. S. Bach
M. P. Berg.
by their Atty's
C. D. Wright & Bro.

# UNITED STATES PATENT OFFICE.

NICOLAS SVENDSON BACH AND MARTIN PAULSEN BERG, OF BOSTON, MASS.

## IMPROVEMENT IN REED-ORGANS.

Specification forming part of Letters Patent No. **164,900**, dated June 29, 1875; application filed April 20, 1875.

*To all whom it may concern:*

Be it known that we, NICOLAS SVENDSON BACH and MARTIN PAULSEN BERG, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain Improvements in Reed-Organs, of which the following is a specification:

In the accompanying drawings, forming part of this specification, Figure 1 is a transverse vertical central section of an organ constructed in accordance with my invention. Fig. 2 is a horizontal section on the plane of line *x x*, Figs. 1 and 3, showing one end of the instrument and the method of operating one of the valves between the vertical wind cells or flues and the horizontal wind-boxes. Fig. 3 is a longitudinal vertical section on the plane of line *y y*, Fig. 1; and Fig. 4, a section on the plane of line *z z*, Fig. 3, showing the tremolo attachment.

This invention has for its object to increase the power, and at the same time improve and vitalize the quality, of the tone of a reed-organ, and also to perfect the construction and operation of the instrument.

To these ends our invention consists, first, in a series of vertically-arranged reed-sets, in combination with a vertical sound-board arranged in close proximity to, but not in contact with, said reed-sets, and constituting a substantially vertical partition between the back of the organ and the reed-sets, a vertical resonance-chamber being thus created which strengthens and improves the tone of the organ. It consists, secondly, in the peculiar arrangement of wind-boxes and flues, whereby communication is established between the reed-sets, arranged as above, and the bellows; and, lastly, in the construction of the reed-tubes and their valves, and the valve-actuating mechanism, all of which we will now proceed to describe.

In the drawings, A represents the organ-case; B, the sound-board; C $C^1$ $C^2$, the reed-sets of the different stops, which may be of any desired number, three being shown in the present application—viz., the "flute," "diapason," and "cor-anglais." The sound-board B is constructed of suitable resonant material, preferably spruce wood, and constitutes a partition between the back of the organ-case and the reed-sets. The reed-sets are arranged in a vertical series, as shown in Fig. 1, in close proximity to the sound-board, but not in contact with it; consequently the tones of the sets are uniformly modified by the sound-board, which strengthens, and at the same time improves and vitalizes, the tones, as we have demonstrated by practical test.

The organ-casing may be provided with a back, *a*, as shown in Fig. 1, in which case a resonance-chamber, D, is created between the back *a* and the sound-board B. The back *a* may be dispensed with, however, when it is desirable to obtain a maximum of power, although we generally prefer to employ it.

The sound-board may be perforated at suitable intervals, if desired.

Each of the reed-sets C $C^1$ is supported by a substantially horizontal wind-box, E, having slots in its upper sides, over which the reeds R are placed, and has a series of reed-tubes, F, which are also supported by said box. The reed-tubes F are composed of hollow blocks, open at their outer ends, the latter being beveled, as shown in Fig. 1, and on these beveled ends or valve-seats the valves H rest, the latter being constructed and operated as will be described hereinafter. The lower reed-set $C^2$ is constructed substantially like the others, the only difference being in the construction of its reed-tubes, which are open at both ends, and the arrangement and operation of its valves. The wind-boxes E of the reed-sets C $C^1$ are connected at their ends with vertical wind cells or flues I I, which rise from a horizontal box or flue, J, the latter opening into the bellows-chamber, as shown in Fig. 3. The wind-box E of the lower reed-set opens directly into the horizontal flue J, on which it rests. The ports or openings K′, which connect the horizontal wind-boxes E E E′ with the flues I I J, are provided with valves L, which are operated by any suitable system of levers and slides under control of the organist. We prefer to employ a slide, M, for each valve, said slide having an inclined surface, which, as it is pushed inwardly, opens the valve by engaging with a staple or projection, N, on the latter, as shown in Fig. 2, the valve being closed, when the slide is withdrawn, by a suitable spring. When the bel-

lows are worked, and the valves opened in playing, the air is drawn downwardly through the reeds into the wind-boxes, and through the flues to the bellows. The reed-valves of the reed-sets C $C^1$ are attached to pivoted levers $H^1$, which rest upon shoulders O of the vertical rods P, which slide vertically in guides S, their lower ends resting upon horizontal pivoted levers T, whose outer ends rest in turn upon the keys U, as shown in Fig. 1. The valves $H^2$ of the lower reed-set $C^2$ are located below the reeds, and are operated by pins V, upon which the rear ends of the levers T rest.

The action thus constructed is well adapted to the above-described arrangement of the reed-sets, and is simple and effective in operation.

Fig. 4 represents the tremolo attachment, which consists of a chamber, W, located at the lower end of one of the vertical flues I above the horizontal flue J. The chamber W is connected by openings *a* with the flue I, and by an opening, *b*, with the flue J, while the flues I J are connected together by an opening, *c*. A slide-valve, *d*, operated by any suitable means, is adapted to close one of the openings *c b*, and leave the other open, thereby allowing the wind to pass directly from the vertical flue I to the horizontal flue J through the tremolo-chamber W, where it passes under a spring-valve, *e*, resting on an inclined seat, *f*, said valve pulsating or vibrating under the influence of the current and producing the tremolo effect.

The instrument thus constructed depends for its utility not only on the sound-board, but also upon the construction adapting all the reed-sets to stand a uniform relation to the sound-board. This construction also improves the general arrangement and operation of the instrument irrespectively of the sound-board.

The horizontal wind-boxes E may be divided centrally by a transverse partition into two parts, so as to enable only half of any stop to be connected at a time, if desired, while the tremolo can be readily connected to any or all of the stops.

We claim as our invention—

1. In a reed-organ, the combination of a vertical series of reed-sets, C $C^1$ $C^2$, with the independent sound-board B, arranged near to, but not in contact with, the reed-board or the wind-passages, substantially as described.

2. The combination of the horizontal reed-sets C $C^1$ $C^2$, wind-boxes E E′, and flues I I J with the bellows of a reed-organ, when constructed and arranged substantially as described.

3. The combination of the beveled reed-tubes F, valves H $H^2$, levers $H^1$, rods P, levers T, pins V, and keys U, substantially as and for the purpose specified.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

NICOLAS SVENDSON BACH.
MARTIN PAULSEN BERG.

Witnesses:
C. F. BROWN,
SAML. M. BARTON.