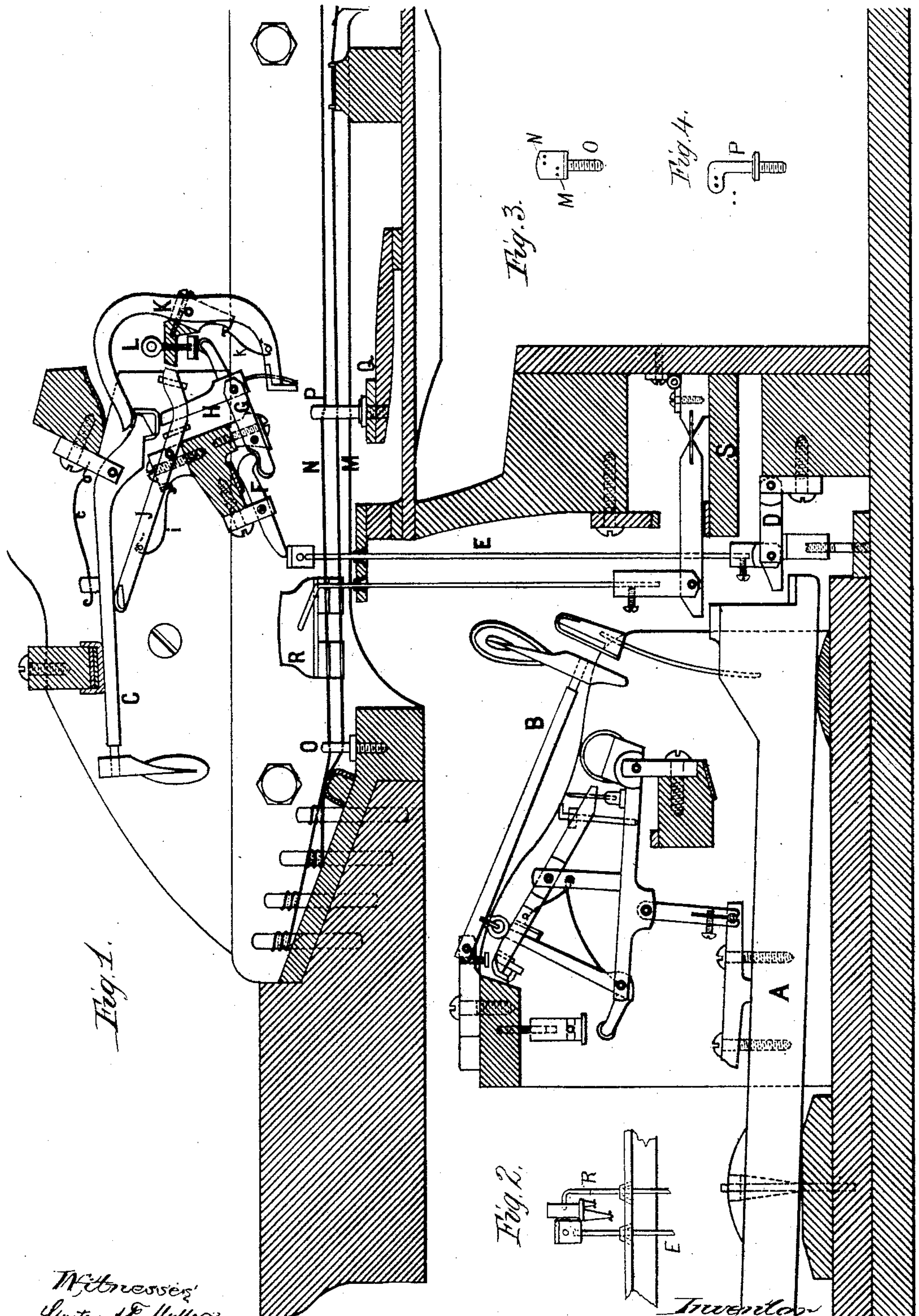
O. LEMCKE.
Piano-Forte.

No. 197,736. Patented Dec. 4, 1877.



Witnesses:
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UNITED STATES PATENT OFFICE.

OTTO LEMCKE, OF SCHKEUDITZ, PRUSSIA.

IMPROVEMENT IN PIANO-FORTES.

Specification forming part of Letters Patent No. **197,736**, dated December 4, 1877; application filed June 29, 1877.

To all whom it may concern:

Be it known that I, OTTO LEMCKE, of Schkeuditz, in Prussia, have invented Improvements in Piano-Fortes, of which the following is a specification:

The object of this invention is to impart greater fullness and beauty of tone to pianos, and especially to grand and upright piano-fortes. For this purpose I place over, or, as the case may be, behind each group of strings belonging to the same note a new pair of strings tuned in the octave of the latter, and struck by a special hammer.

The introduction of such strings tuned in the octave is not new; but hitherto they have usually been made to sound by the transfer of vibration from the fundamental note. These strings, however, do not commence to vibrate quick enough to give the desired effect if the notes are short.

According to my arrangement, the key on being touched not only causes a hammer to strike the strings for the fundamental note, but it also acts on a second hammer, provided with special mechanism, by which the octave is made to sound, as hereinafter described.

The arrangement is shown on the accompanying sheet of drawings for a single note of a piano-forte with horizontal strings.

The lower hammer mechanism does not require any explanation, as it does not present any new features.

The novelty of the invention consists in the application of the upper hammer mechanism, and in the manner of transmitting motion to the same from the key A. By the pressure on the key a small lever, D, is lifted, as also the rod E jointed to the lever, suitably guided at the top, and passing upward between the strings. The motion of the rod E is transmitted by the levers F and G to the jack H, so as to cause the hammer C to strike. After having acted, the hammer is caused to return to its position of rest by the spring *c* attached to the same, and besides by the lever J with its spring *i*. The curved lever K assists in retaining the hammer C in its position of rest. At the moment, however, the key is touched it (the lever) is turned by a pin fixed to the lower end of the jack H, so as to allow the hammer end to rise. The lever K, with its spring *k*, moreover serves to return the jack H to its position of rest. The motion of the latter is regulated by the screw L, so as to cause the hammer C to strike simultaneously with the hammer B.

In larger piano-fortes three strings are generally used for the fundamental note; but in the drawing only two are shown. These pass at one end through holes in the agraffe O on the wrest-plate, and thence to the tuning-pins. The octave-strings N, which must be shorter than those for the fundamental note, also pass through the agraffe O, and, besides, through the center agraffe P, Figs. 1 and 4, mounted on a special ledge, Q, which is fixed to the sounding-board. The head of the center agraffe P is bent to one side, so that the strings M may pass the agraffe without touching it. The holes in the same are drilled at an incline, so as to provide a firm point of support for the strings N, at the end of their vibrating part, without their forming an angle, by which a disadvantageous pressure would be caused on the sounding-board. By this means, also, a parallel provision of the strings M and N is attained.

By the above-described arrangement, according to which the strings M, as well as the strings N, of one note pass through the same wrest-plate agraffe O, an increase in size of the piano-forte, which would otherwise be caused by the application of the octave-strings, is avoided.

The damper R, Figs. 1 and 2, touches the strings M with its longer felt pieces, and the strings N with the shorter ones, so that it simultaneously acts on both groups of strings. The dampers are lifted in the usual way, either singly by the touch of the keys, or all together by the forte-pedal acting on the ledge S.

The head of the hammer C should be covered with softer leather or felt than the hammer B, so as to cause the octave to sound softer than the fundamental note.

The arrangement of the mechanism for operating the hammer C may be modified in various manners, as the same does not constitute an essential point of my invention. In the case of upright pianos this is even required, as both hammers, with their mechanisms, must be adapted to the vertical strings.

I am aware that two sets of strings and two hammers have before been combined with one key, and this, broadly, therefore, I do not claim; but

I claim as my invention—

The key A, and hammers B and C, in combination with two sets of strings, M and N, located between the hammers, substantially as and for the purpose described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

OTTO LEMCKE.

Witnesses:
TH. EHRENBERG,
HENRY VANARSDALE.