M. H. MATTES.

COMBINED WIND AND STRINGED INSTRUMENT.

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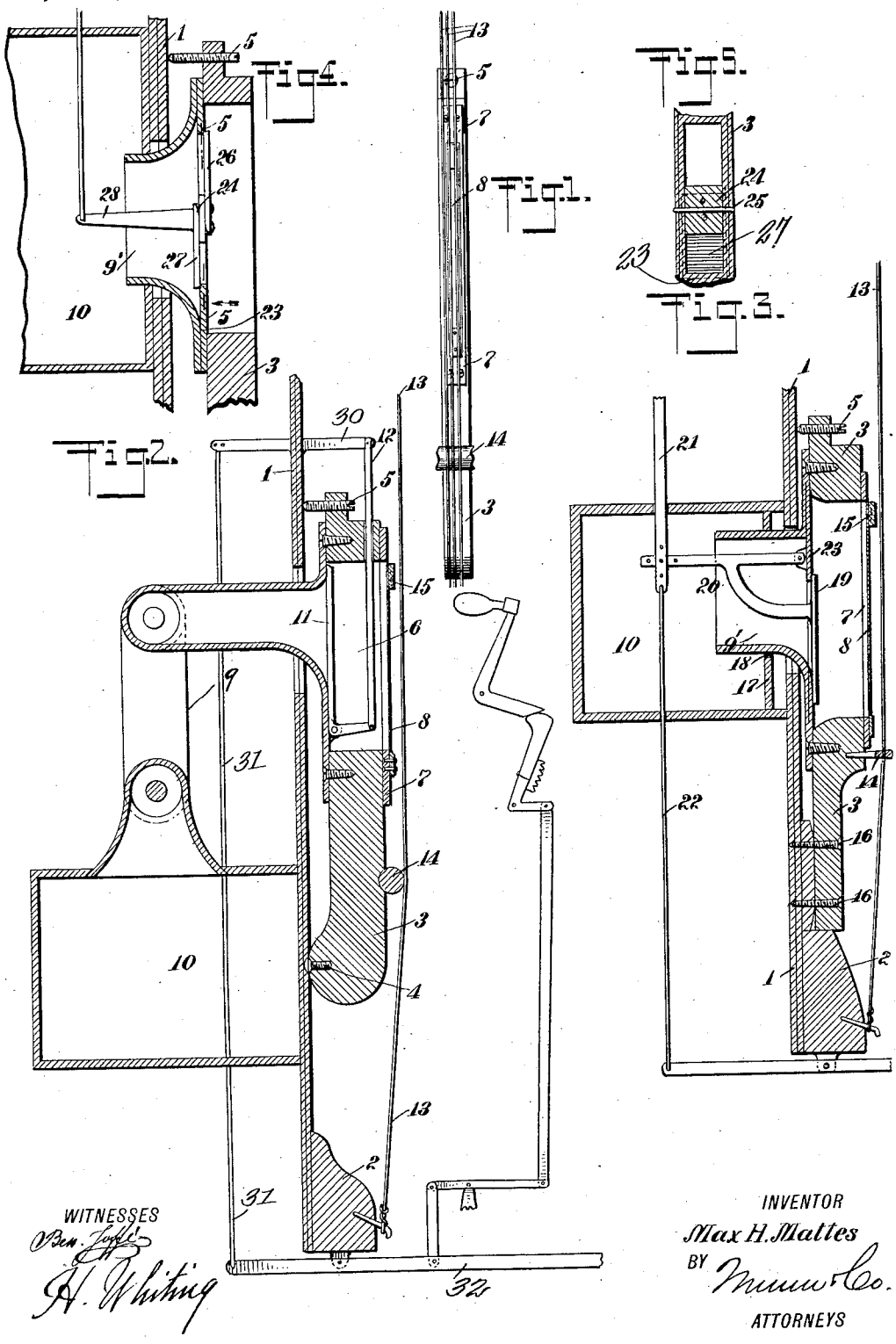

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COMBINED WIND AND STRINGED INSTRUMENT.

1,070,974. Specification of Letters Patent. Patented Aug. 19, 1913.

Application filed June 18, 1909. Serial No. 502,902.

To all whom it may concern:

Be it known that I, MAX H. MATTES, a citizen of the United States, and a resident of the city of New York, borough of Manhattan, in the county and State of New York, have invented a new and Improved Combined Wind and Stringed Instrument, of which the following is a full, clear, and exact description.

This invention relates to a new and improved attachment for stringed instruments, such as pianos or the like, which is adapted to vibrate the strings of the instrument.

An object of the invention is to provide a device which will be simple in construction, easily operated, and which will produce a combined harmonious tone, due to the simultaneous vibration of the strings and the vibrating mechanism.

A further object of the invention is to provide a simple and accurate means for adjusting the vibrating mechanism relative to the strings.

These and further objects, together with the construction and combination of parts, will be more fully described hereinafter and particularly set forth in the claims.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views, and in which—

Figure 1 is a vertical front view of my device; Fig. 2 is a vertical section through one form of the device; Fig. 3 is a vertical section through another form of the device. Fig. 4 is a vertical section of another form of the device; and Fig. 5 is a section on the line 5—5 in Fig. 4.

Referring more particularly to the separate parts of the device, 1 indicates the sounding-board of the instrument, to which is attached in any suitable manner at one end a wrest-plank 2.

In the form illustrated in Fig. 2, there is provided a suitable member 5, which is fulcrumed on the sounding-board 1 by any suitable means, such as a fulcrum-screw 4, which rests in a depression in the sounding-board. The other end of the member 3 is made adjustable relative to the sounding-board 1 by means of a suitable set-screw 5. The member 3 comprises a reed cell having an opening 6 therein, which is adapted to be closed at one side by a plate 7, having a flexible reed 8, secured at one of its ends in any manner to the plate 7 at one end, and being free to vibrate at its opposite end. The opposite end of the opening 6 is covered by one end of a suitable connecting pipe 9, which extends through an opening in the sounding-board, and which, as shown in Fig. 2, consists of a plurality of pivotally-connected sections of pipe. The pipe 9 is connected at its opposite end to an air-chest 10, which is adapted to draw the air through the reed 8 by means of the suction created by a vacuum in the air chest 10. In order to regulate the flow of air between the chest 10 and the reed 8, there is provided a valve 11, which is pivotally secured in any well-known manner to the end of the pipe 9, and is operated by a suitable connecting rod 12, which is operated in any suitable manner, as by means of the keys on the piano. Suitably secured to the wrest-plank 2 in any well-known manner, there are provided a plurality of strings 13, which rest on a bridge 14 secured to the member 3 in any well-known manner. The strings 13 are preferably three in number, preferably only two of which, however, overlie the reed 8 and are operated thereby, the third string being free to vibrate without its vibrations being modified by the reed. There is provided a suitable cushion 15 on the reed 8, which is secured thereto in any well-known manner, and is interposed between the reed and the wires 13. The reed and its cushion are adjusted in close spaced relation to the strings or wires, and when the reed is caused to vibrate within the opening through the plate to which it is secured at one end, the cushion is intended to have physical contact with the wires, causing them to vibrate or causing the tone thereof, due to the ordinary hammer, to be modified in the manner well known in this art. The current of air or wind, when the valve 11 is opened, passes through the wires and the reed mechanism, into the air chest, and said blast of air acting upon the reed first bends it inwardly or away from the wires, and the rebound of the reed, if the wind impulse is not too strong, will cause the cushion to strike against the wires.

In the form shown in Fig. 3, the member 3 is secured to the sounding-board 1 in a little different manner at one end, in that it has a plurality of set-screws 16, which are adapted to be tightened or loosened to allow for the adjustment of the member rela-

tive to the sounding-board for the purpose of varying the proximity of the reed to the wires or strings. The bridge 14 in this case is also of slightly different structure. The principal difference, however, in this form from the form shown in Fig. 3 consists of the adjustable connection between the air-chest 10 and the connecting pipe 9′. The connecting pipe 9′ extends through an opening in a partition 17, which is secured to the air-chest 10 in any well-known manner, and has a packing-joint 18, which is adapted to prevent the air from being drawn other than through the connecting pipe 9′. The valve in the device shown in Fig. 3 is also slightly different, in that it consists of a valve-plate 19, secured in any well-known manner to a curved member 20, which forms one arm of a bell-crank lever, which is pivoted in any well-known manner to a partition 23 having a valve opening therein, and is adapted to be operated either by a rigid connecting-rod 21 or a flexible connection 22. Either of the connections 21 or 22 is adapted to be operated by any suitable means, such as the keys of the piano.

The form shown in Figs. 4 and 5 differs from the form shown in Fig. 3, merely in having a different type of valve, which is of the balance type, so as to require little force to operate it against the air pressure. It consists of a block 24 which is pivoted in the valve opening in the partition 23, by any suitable means, such as a pin 25, a pair of valve members 26 and 27, which are larger than the valve opening in the partition 23 and are adapted to abut against the opposite sides of the partition 23, and an operating lever arm 28.

The operation of the device will be readily understood from the above description.

There is provided one of these string-vibrating mechanisms for each note of the instrument, and as in the case of the piano, there would be one for each key.

I employ different types of valves in different parts of stringed instruments, as illustrated in Figs. 2, 3 and 4. The valve shown in Fig. 2 is quite simple in construction and may be used in a variety of relations. I prefer to employ it, however, for the high register for the reason that the high register does not necessarily require much opening of the valve, and the one here shown appears to be adequate for the purpose. In Fig. 3 the valve shown may be employed to advantage in connection with the medium register. In this valve the valve member 19 is lifted bodily away from the opening which it covers and thus leaves the clearance spaces at the ends of the valve member more nearly equal. In the form shown in Fig. 4, the valve member is balanced and therefore can be operated with a comparatively small expenditure of effort. Not only that, but a given movement of the valve exposes a comparatively large opening whereby a slow and gradual effect of the wind upon the heavy wires or strings is secured, it being well understood in this art that a sudden wind impulse upon a bass reed would tend to hold it or interfere with its proper vibration.

With this device attached to a piano, the valve operating the reed mechanism is manipulated simultaneously with the striking of the keys to produce a vibration of the strings by means of an ordinary hammer. By holding the keys down, the length of the vibration may be prolonged and varied. By manipulating the adjusting-screw 5, the casing 3 and the reed with it, may be adjusted relative to the strings 13, so as to change the action of the reed on the strings.

As shown in Fig. 2, there is a key mechanism indicated by the numeral 32 and pivoted at the bottom of the sounding board, and at another portion of the sounding board above the valve mechanism there is pivoted a bar 30. One end of said bar is connected by a rod 12 to the valve, and the other end of the bar is connected through a bar 31 to a key mechanism 32. When the piano key, therefore, is struck to operate the usual hammer, the valve will be opened to permit an air current to pass through the reed mechanism as already described.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:—

1. In a combined wind and stringed instrument, the combination of a string, means to cause the string to vibrate to produce a tone, pneumatically operated mechanism acting upon said string to modify its vibration and its tone, said mechanism including an air chest, a member comprising a reed cell, a reed connected to said member and located in close spaced engageable relation to the string, a tubular connection between the air chest and the reed cell, and means to control the passage of air through the reed cell, means to adjust said reed cell member toward or from the string so as to vary the effect of the reed upon the string, the air-chest remaining in fixed position, and means to simultaneously cause the operation of the string vibrating means and the means to control the passage of air through the reed cell.

2. The combination of a support, a member comprising a reed cell adjustably connected with said support, a reed mounted upon said member, a stationary air chest, a tubular connection between the reed cell and the air chest, a valve controlling the passage of air through said tubular connection, a string in close spaced engageable relation to said reed, and means to simultaneously start the vibration of the string and

open said valve whereby the tone produced by the string is modified by the action thereupon by said reed.

3. In a device of the character set forth, the combination with a plurality of strings and a member comprising a reed cell, of a reed connected at one end to said member and having its other end in close spaced engageable relation to one or more of said strings, an air chest for operating said reed, means to adjust the reed cell member and its reed toward or from the strings, a jointed tubular connection between said air chest and said reed cell member, and means to start the vibration of the strings and control the passage of air through the reed cell, substantially as set forth.

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

MAX H. MATTES.

Witnesses:
HORATIO WHITING,
PHILIP D. ROLLHAUS.