July 1, 1930. W. G. BETZ 1,769,284

PIANO

Filed Sept. 30, 1926 2 Sheets-Sheet 1

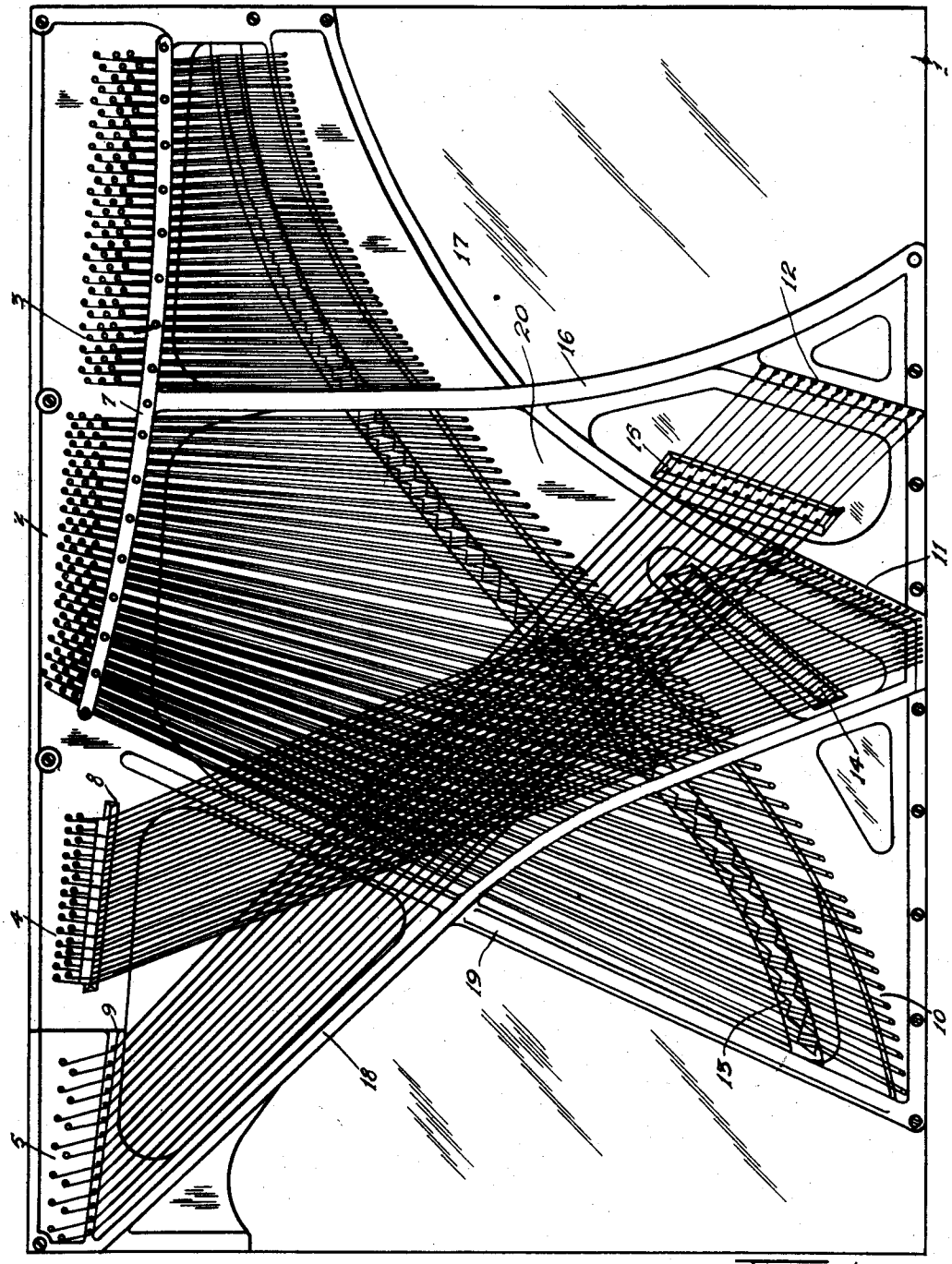

Fig. 1.

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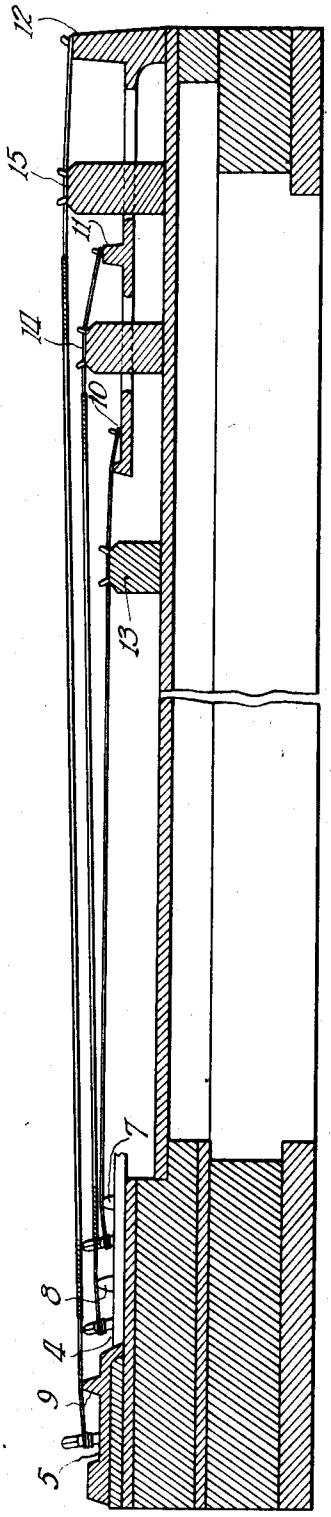

Fig. 2.

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UNITED STATES PATENT OFFICE

WILLIAM G. BETZ, OF HAMMOND, INDIANA

PIANO

Application filed September 30, 1926. Serial No. 138,762.

My invention relates to pianos and has to do more particularly with the string plate or string mounting construction, an object being to provide an improved arrangement of the above character. One of the features of my invention is the provision of such a construction whereby a lower string plate and sound board may be used in upright pianos, thus permitting the construction of a piano of reduced height without impairing the tonal quality.

In the construction of string plates for supporting the scale or strings it is desirable that certain minimum lengths of strings be provided, particularly for the lower notes, in order to impart more perfect vibrating power and resonance to these strings. Heretofore in the construction of upright pianos it has been the practice to use two overstrung or superimposed sections, that is the scale was divided into two sections with the lower notes strung over the higher ones and the two layers crossed in over-strung relation and angularly disposed relative to each other.

It is most desirable at the present age to reduce pianos in height, so as to provide the smallest practical instrument but without impairing the tonal quality. One of the objects of my invention is to provide such a string plate construction which permits a reduction in height in the piano but still maintaining substantially the normal length of the lower note strings and thereby retaining the same tonal effect as in prior pianos considerably greater in height. To this end I divide the scale of strings into a plurality of sections, more particularly three sections, which are disposed in over-strung layers and so angularly positioned that the long lower note strings retain substantially the normal length used in the higher piano.

Fig. 1 is a face view showing an embodiment of my invention, and

Fig. 2 is a vertical sectional view thereof.

For a better understanding of my invention reference is to be had to the accompanying drawing, in which a suitable sound board 1 is provided which may be of any desired construction and upon which I mount a skeleton frame or string plate. This string plate has an upper or tuning pin section 2 which is of a sufficient length so that the strings may be distributed along to take the adjacently disposed hammers. The tuning pin section 2 of the plate is preferably divided into three string sections including section 3 which comprises the three string notes, section four the two string notes and section 5 the one string notes. The tuning pins extend through the metal portion of the plate and any suitable means for holding the pins may be provided, such as the usual tuning pin wooden block which is set back of the face of the string plate between it and the sounding board 1. The strings of the various sections pass over suitable bridge pieces as 7, 8, 9, preferably disposed in different planes one above the other so that the three string sections may be disposed in three different superimposed planes to provide sufficient clearance between the string sets.

The three sets of strings extend downwardly to their corresponding hitch pins and as in the case of the tuning pin sections above, I preferably divide the hitch pin ends into three different sections 10, 11, 12 to correspond with the upper sections 3, 4 and 5, respectively. In order to bring the three sets of strings into the over-strung or superimposed planes, I provide resting surfaces on three bridges 13, 14 and 15 disposed in proper planes one above the other.

In the ordinary upright string plate construction as heretofore used, the single note strings 5 have been disposed to the left of the two string notes 4, so that they run parallel. It will be apparent that with the strings 5 disposed to the left of strings 4 in the construction here illustrated, the strings 5, although lower notes than those of strings 4, would be of substantially the same length as strings 4, and with the plate reduced in height over prior plates these strings 5 would be shorter than those heretofore used, thereby impairing the tonal effect. To simply swing all of the strings of sections 4 and 5 to the right so as to have the angle of strings 5 would provide a two layer construction, but the two string notes of section 4 would extend at too great an angle across the face

of the hammers, so that there would be great danger of the hammers overlapping onto adjacent strings.

By my improved arrangement I overcome these objections and maintain the desired length of string for the lower notes and thus permitting a reduction in height of the piano without affecting the tonal quality of these lower strings.

In the string plate construction illustrated I provide suitable ribs such as 16, 17, 18 and 19 to strengthen the plate and then provide webs such as 20 to suitably support the ribs and provide hitch pin supports. These webs are also suitably cut out so as to permit insertion of the bridge pieces 13, 14 and 15 which preferably rest against the sound board on which the string plate is mounted.

Although I have illustrated a preferred form of construction, I contemplate applying my invention in other ways and therefore do not desire to be limited to the exact construction shown and described, but aim to cover all that which comes within the spirit and scope of the appended claims.

What I claim as new and desire to secure by United States Letters Patent is:

1. In a piano having the strings disposed in three string sections comprising the treble, base and sub-base sections respectively and each disposed on a different plane, a sound board and a string plate secured to the sound board at top and bottom thereof, said string plate including a tuning pin section, a hitch pin section and a plurality of ribs intercepting each other to form two crosses interconnecting the tuning pin section and hitch pin section.

2. In a piano having the strings disposed in three string sections comprising the treble, base and sub-base sections respectively and each disposed on a different plane, a sound board and a string plate secured to the sound board at top and bottom thereof, said string plate including a tuning pin section, a hitch pin section and a plurality of ribs intercepting each other to form two crosses interconnecting the tuning pin section and hitch pin section, one of said crosses having one of the ribs curved and abutting in part the strings of the sub-base string section and in part the strings of said base section.

3. In a piano having the strings disposed in three string sections comprising the treble, base and sub-base sections respectively and each disposed on a different plane, a sound board and a string plate secured to the sound board at top and bottom thereof, said string plate including a tuning pin section, a hitch pin section and a plurality of ribs intercepting each other to form two crosses interconnecting the tuning pin section and hitch pin section, one of said crosses having one of the ribs curved and abutting in part the strings of the sub-base string section and in part the strings of said base section, and the other rib of said pair of ribs being straight and paralleling in strings of said treble section.

4. In a piano having the strings disposed in three string sections comprising the treble, base and sub-base sections respectively and each disposed on a different plane, a sound board and a string plate secured to the sound board at top and bottom thereof, said spring plate including a tuning pin section, a hitch pin section and a plurality of ribs intercepting each other to form two crosses interconnecting the tuning pin section and hitch pin section, one of said crosses being composed of two curved ribs, one of said curved ribs following in a general way the outline of the hitch pins of the treble string section and terminating at the bottom of the sounding board.

5. In a piano having the strings disposed in three string sections comprising the treble, base and sub-base sections respectively and each disposed on a different plane, a sound board and a string plate secured to the sound board at top and bottom thereof, said string plate including a tuning pin section, a hitch pin section and a plurality of ribs intercepting each other to form two crosses interconnecting the tuning pin section and hitch pin section, one of said crosses being composed of two curved ribs, one of said curved ribs following in a general way the outline of the hitch pins of the treble string section and terminating at the bottom of the sounding board, and the other of said curved ribs being parallel with the treble strings at its upper end and curving out gradually to form a support for the strings of the sub-base section, an auxiliary branch rib being provided communicating with said rib and holding the hitch pins of said sub-base string section.

6. In a piano having the strings disposed in three string sections comprising the treble, base and sub-base sections respectively and each disposed on a different plane, a sound board and a string plate secured to the sound board at top and bottom thereof, said string plate including a tuning pin section, a hitch pin section and a plurality of ribs intercepting each other to form two crosses interconnecting the tuning pin section and hitch pin section, one of said crosses being composed of two curved ribs, one of said curved ribs following in a general way the outline of the hitch pins of the treble string section and terminating at the bottom of the sounding board, and the other of said curved ribs being parallel with the treble strings at its upper end and curving out gradually to form a support for the strings of the sub-base section, an auxiliary branch rib being provided communicating with said rib and holding the hitch pins of said sub-base string section, the bottom part of said other rib supporting the hitch pins for said base string section.

7. In a piano having the strings disposed in three string sections comprising the treble, base and sub-base sections respectively and each disposed on a different plane, a sound board and a string plate secured to the sound board at top and bottom thereof, said string plate including a tuning pin section, a hitch pin section and a plurality of ribs intercepting each other to form two crosses interconnecting the tuning pin section and hitch pin section, one of said ribs extending above the others so as to permit the strings of the treble section to pass thereunder.

8. In a piano having strings disposed in three string sections, comprising treble, base and sub-base sections, respectively, and each disposed on a different plane a sound board and a string plate secured to the sound board at top and bottom thereof, said string plate including a tuning pin section, a hitch pin section, a plurality of ribs interconnecting the two sections, a web interconnecting the ribs in the hitch pin section, and bridges for the base and sub-base sections disposed on the sound board and projecting through apertures in said web.

In witness whereof, I hereunto subscribe my name this 18th day of May, 1926.

WILLIAM G. BETZ.