(No Model.)

A. NEWELL.

METHOD OF BUSHING KEY BOARD MORTISES.

No. 446,463. Patented Feb. 17, 1891.

Fig. 1.

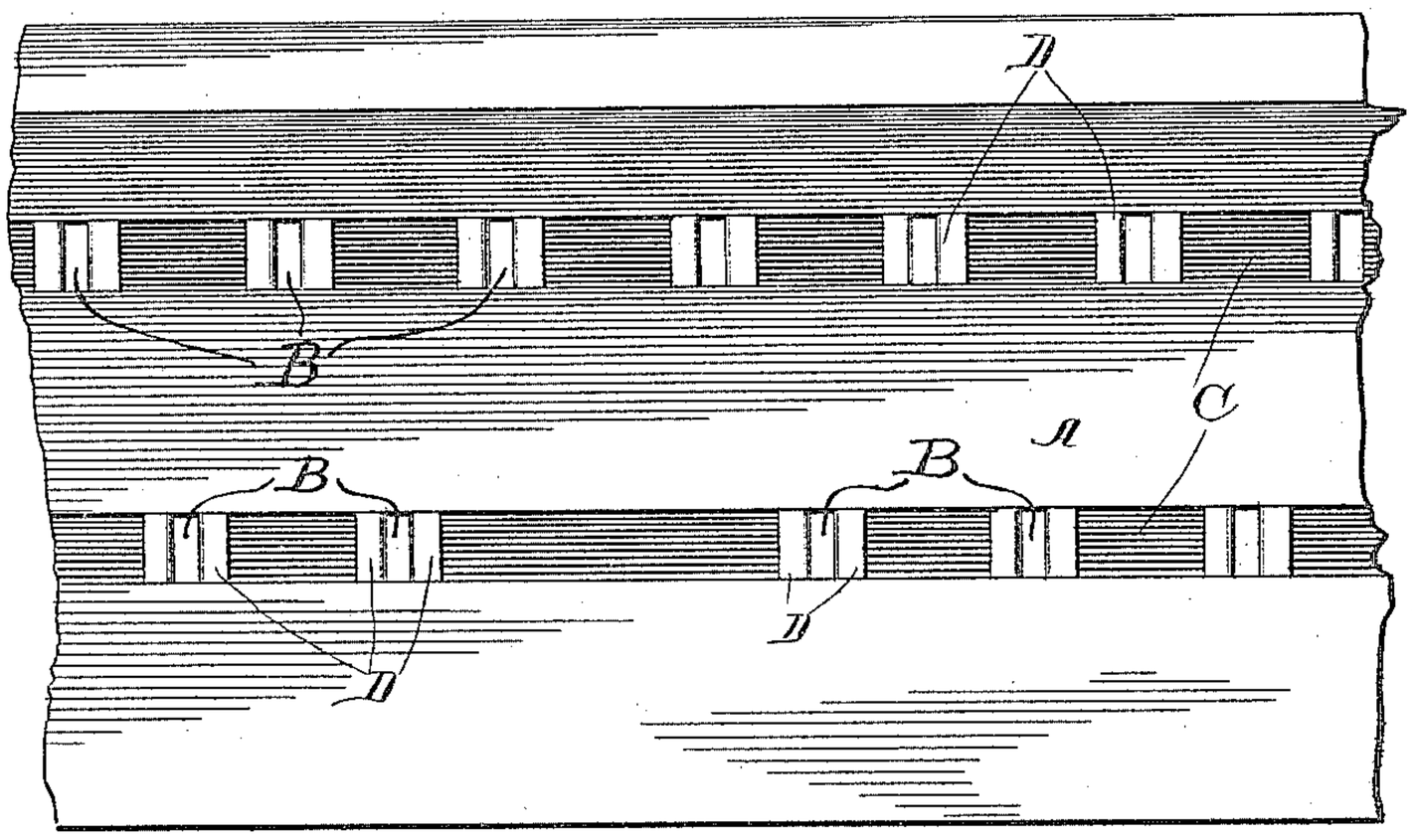


Fig. 2.

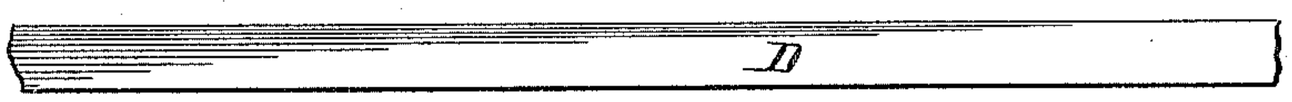


Fig. 3.

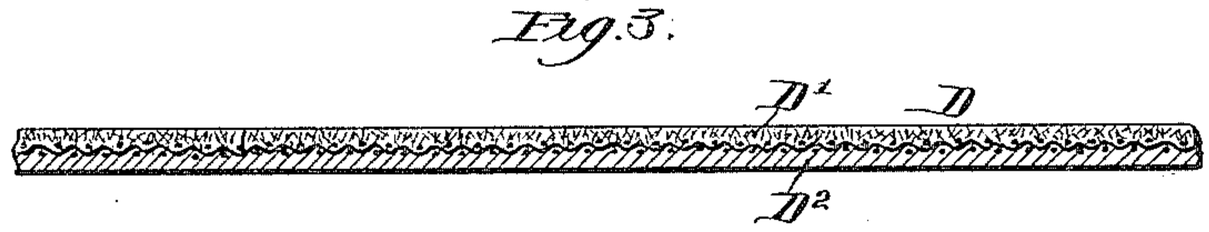
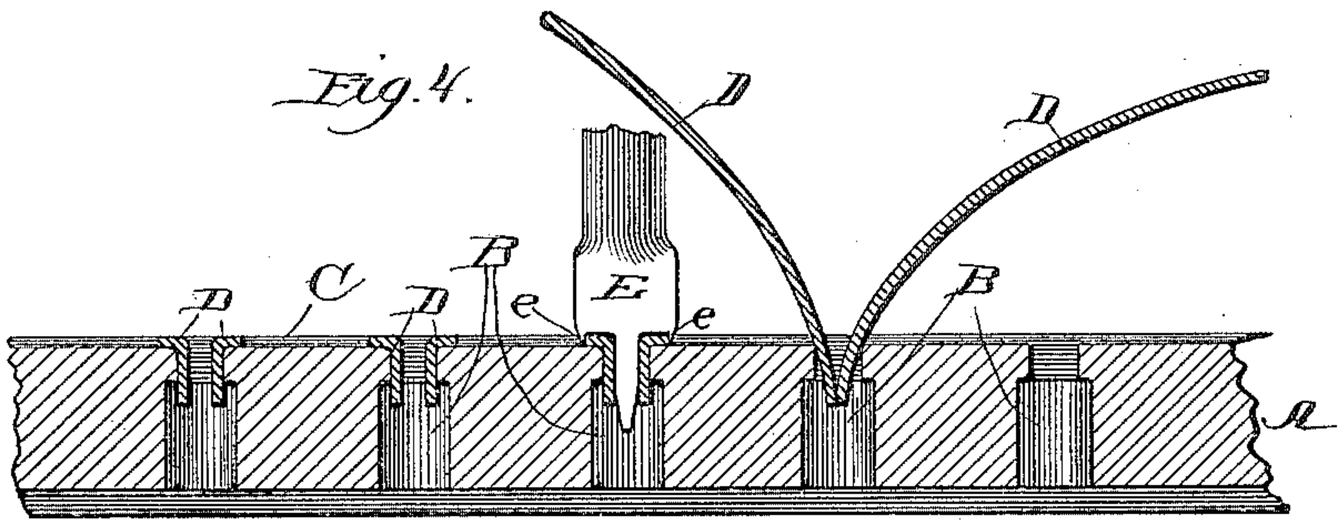


Fig. 4.



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UNITED STATES PATENT OFFICE.

AUGUSTUS NEWELL, OF CHICAGO, ILLINOIS.

METHOD OF BUSHING KEY-BOARD MORTISES.

SPECIFICATION forming part of Letters Patent No. 446,463, dated February 17, 1891.

Application filed September 22, 1890. Serial No. 365,825. (No model.)

To all whom it may concern:

Be it known that I, AUGUSTUS NEWELL, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Methods of Bushing Key-Board Mortises; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

This invention relates particularly to the application of felt bushings to what are called the "front mortises" of organ and piano key-boards. The keys of these key-boards are hinged by their rear ends to the rear of the key-board frame, and their front ends are guided vertically by pins extending from the front of the key-board frame upward into the front mortises of the keys. To prevent noise when the keys move up and down upon said pins, a felt bushing is placed against the wall at each side of each mortise, so that the pin resting in said mortise will touch the felting instead of the wood of the key.

In the accompanying drawings, Figure 1 is a view of the bottom of a portion of a key-board which is to be sawed into keys. Fig. 2 is a view of a strip of felt from which pieces are taken for facing the walls of the mortises. Fig. 3 is an enlarged section of such felt. Fig. 4 is a section of a key-board blank, taken in the direction of the length of the latter through five mortises.

The mortises are elongated at the upper surface of the key in the direction of the length of the latter, while in the lower portion of said key the mortise is made by boring a hole of a diameter equal to the length of the upper portion of said mortise.

In the drawings, A is a key-board blank.

B B are the mortises.

C is a channel along the line of mortises to make depth sufficient to receive the portion of the felt turned laterally outside of the mortises.

D is the felt strip from which the short pieces for the mortises are to be taken.

D′ is the soft spongy surface, and D² is the dry coat of glue.

As a first step in the preparation of the felt strip, a sheet of felt is coated upon one side with glue and the latter allowed to dry. As a further step, this sheet of felt with the dry coat of glue upon one side of it is cut into strips or ribbons D, of a width equal to the length of the upper portion of the mortises B. These sheets and strips may be prepared in quantity and kept in stock for an indefinite time. As a further step, one end of each of the two strips D is exposed to steam for an instant, whereby the glue is softened sufficiently to effect adhesion to the wood. These two ends are then inserted into the upper portion of the mortise, as shown at the right in Fig. 4, the glue side being against the walls of the mortise B. Then by suitable means, preferably a plug E, as shown at the left in Fig. 4, said ends are pressed against the walls of the mortises B and the strips cut off just above said mortises. It is preferable to lay a portion of the felt in the channel C outside of the mortise B, as shown at the left in Fig. 4. When this is done, said portion is also to be pressed against the wood beneath it. The plug E, it will be seen, is of proper shape to press the felt against each of the side walls of the mortise as well as against the wood in the channel C. Said plug is further shown as provided with depending cutting-edges *e* for cutting the strips of felt when said plug has been driven to its place. A number of the plugs E are to be used, in order that the operative may place the felt and plug in one mortise, and then in another and another, and so on, leaving the first ones a sufficient length of time to allow the glue to set. The setting of the glue may be hastened by using hot plugs E. This heating may be readily accomplished by leaving the idle plugs exposed to heat, as by laying them upon a heated surface. Such surface may be near the operator and heated by a flame or by steam or otherwise.

Heretofore the felt strips have not been cut from sheets provided with a coat of dried glue. On the contrary, the strips D have been cut from the untreated felt, and an end of each of two strips smeared upon one surface

with liquid glue and immediately applied to the mortise. This manner of applying the glue is tedious, difficult to perform, apt to cover the edges of the felt, and to place upon the strip an excess of glue. When the latter occurs, an extra length of time is required for the glue to harden and set, and the glue is then also apt to penetrate the outer surface of the felt or be squeezed around the edges thereof until it adheres to the outer surface of the felt, and thus forming a hard surface against which the pin in said mortise may make contact. This is objectionable. It is essential that the soft spongy surface of the felt be preserved, otherwise the keys will rattle.

By coating the broad sheet of felt the glue may be evenly spread over the entire surface, and the strips cut from such sheet have clean edges.

For softening the glue I have found that steam operates admirably. It instantly softens the surface which is to make contact with the wood, while the felt surface is in no way harmed. I have found that the softening cannot be practicably accomplished by exposing the strip to heat not accompanied by moisture. For example, it is not practicable to soften the glue by exposing the strip to the heat of a flame or placing it into contact with a heated surface. The active heat of the steam and the simultaneous presence of the finely-divided water of which the steam is composed alone produce the quick softening to and to no more than the proper degree without in any manner injuring the felt portion of the strip.

I claim as my invention—

1. The herein-described method of bushing key-board mortises, which method consists in facing one side of felt with glue and allowing said glue to dry, then softening said glue with heat accompanied by moisture and applying said felt to the walls of the mortises with said glue against said walls, and allowing said glue to harden and set, substantially as shown and described.

2. The herein-described method of bushing key-board mortises, which method consists in facing one side of felt with glue and allowing said glue to dry, then softening said glue with steam and applying said felt to the walls of the mortises with said glue against said walls, and allowing said glue to harden and set, substantially as shown and described.

3. The herein-described method of bushing key-board mortises, which method consists in facing one side of felt with glue and allowing said glue to dry, then softening said glue with heat accompanied by moisture and applying said felt to the walls of the mortises with said glue against said walls under pressure and heat not accompanied by moisture, and allowing said glue to harden and set, substantially as shown and described.

4. The herein-described method of bushing key-board mortises, which method consists in facing one side of felt with glue and allowing said glue to dry, then softening said glue with steam and applying said felt to the walls of the mortises with said glue against said walls under pressure and heat not accompanied by moisture, and allowing said glue to harden and set, substantially as shown and described.

In testimony whereof I affix my signature, in presence of two witnesses, this 16th day of September, 1890.

AUGUSTUS NEWELL.

Witnesses:
CYRUS KEHR,
AMBROSE RISDON.