M. PRATT.

Machine for Smoothing Ivory Key-Boards.

No. 195,902. Patented Oct. 9, 1877.

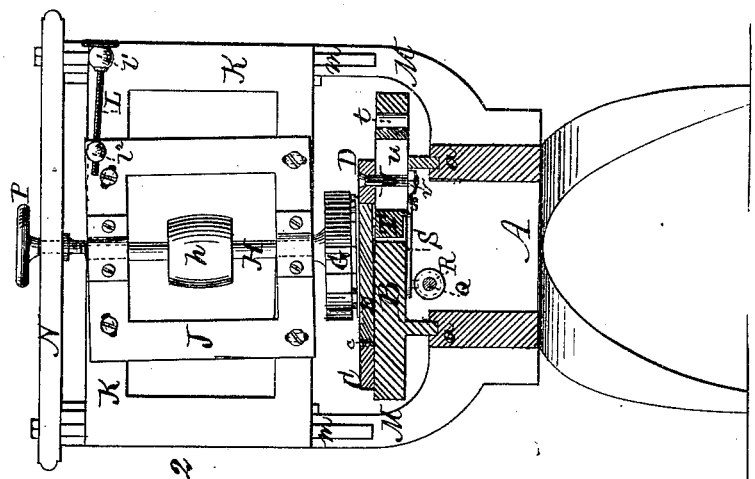

Fig. 2

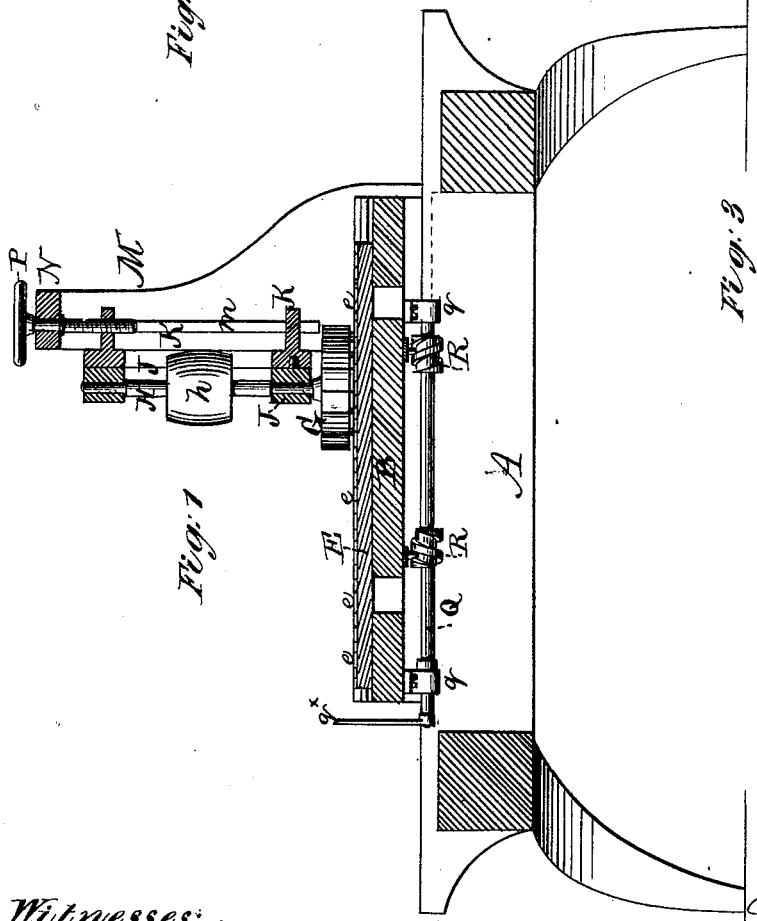

Fig. 1

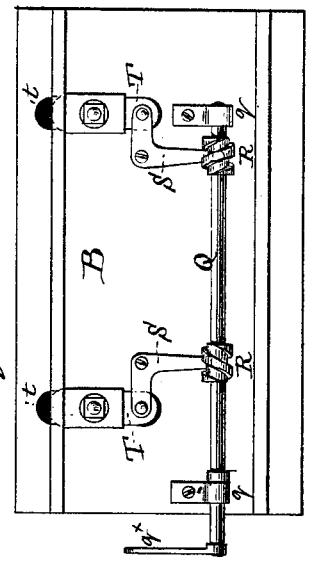

Fig. 3

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UNITED STATES PATENT OFFICE.

MILON PRATT, OF DEEP RIVER, CONNECTICUT, ASSIGNOR TO PRATT, READ & CO., OF SAME PLACE.

IMPROVEMENT IN MACHINES FOR SMOOTHING IVORY KEY-BOARDS.

Specification forming part of Letters Patent No. **195,902**, dated October 9, 1877; application filed May 21, 1875.

To all whom it may concern:

Be it known that I, MILON PRATT, of Deep River, in the county of Middlesex and State of Connecticut, have invented certain Improvements in Machines for Smoothing Ivory Key-Boards; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to a machine for dressing and smoothing ivory key-boards of musical instruments, in which such key-boards are carried by a reciprocating bed, which moves them to and fro in contact with a revolving cutter-head.

The invention consists, first, in a novel mode of supporting the key-board on the bed, whereby the ivory veneers are dressed and smoothed to a uniform thickness throughout.

The invention consists, further, in certain details of construction and arrangement of parts for the adjustment of the cutter-head to the surface of the key-board, and the adjustment of the clamping-bars to hold the key-board in place on the bed, and to accommodate key-boards of different widths.

In the accompanying drawings, Figure 1 is a longitudinal vertical section of a machine constructed according to my invention. Fig. 2 is a transverse vertical section of the same. Fig. 3 is a view of the under side of the reciprocating bed.

The frame A of the machine may be of any suitable construction, and is provided in its upper portion with ways *a*, upon which slides the reciprocating bed B. On the upper side of this bed are two clamping-bars, C D, for clamping and holding in place the key-board E. The bar C is rigidly attached to the bed B, or, if desired, may be in one piece with said bed, and may be provided with a rib or tongue, *c*, for engagement with a groove in the rear edge of the key-board, in order to facilitate the holding of the key-board in place.

The bar D is movable, and provided with means for adjusting it laterally toward or from the front edge of the key-board. The bed B and bars C D are constructed of iron, and are planed perfectly true. The thickness of the bar D is greater than that of the key-board, for the purpose hereinafter explained.

The key-board is prepared in the usual way by attaching to the board E the ivory veneers *e*, to form the facings for the keys, the veneers *e* projecting slightly beyond the front edge of the board E, in the ordinary manner.

The key-board, having been properly prepared, as above described, is placed upon the bed B and clamped between the bars C and D in such a position that the rear portion of its under side rests fairly upon the bed, while the projecting edges of the veneers rest upon the upper side of the bar D, which, being thicker than the board E, prevents the front portion of the under side of said board from coming in contact with the surface of the bed.

Heretofore it has been usual to place the key-board flat upon the bed when dressing and smoothing the upper surface of the ivory veneers, in consequence of which, if any irregularity or inequality existed in the thickness of the board, some of the veneers would be cut or scraped thinner than others.

This disadvantage is entirely obviated in my invention. The upper side of the board E is made perfectly smooth and level before attaching the veneers, and when the veneers are all attached to the board their under sides are necessarily all on the same level. Consequently, when the key-board is held upon the bed in the position described, with its front edge supported by the overhanging edges of the veneers resting on the upper side of the bar D, and submitted to the dressing and smoothing operation, the veneers are all cut or scraped to a uniform thickness, with their upper and lower surfaces parallel with each other.

I have thus far described the bar D, upon which the veneers rest, as the movable bar; but, if desired, it may be stationary, and the other clamping-bar, C, may be movable.

In order to adjust the dressing and smoothing apparatus to the inclined surface of the key-board, and to regulate the adjustment to suit different inclinations, resulting from different thicknesses of veneers, the shaft H, to which the cutter-head G is attached, is arranged in a swinging frame, J, so that it may

be inclined from a vertical direction. The frame J is pivoted, preferably near the center of its lower edge, to a frame, K, and is oscillated by means of a screw, L, passing through an eye, l^1, attached to the frame K, and having its threaded portion engaging with an internally-threaded eye, lug, or nut, l^2, attached to the swinging frame J. By turning the screw L in one direction or the other, the frame J is oscillated, so as to incline the shaft H from a vertical position, and thereby bring the face of the cutter-head G to a position exactly parallel with the surface of the veneers on the key-board. The frame K, to which the swinging frame J is attached, is arranged to slide in vertical ways *m* in standards M, attached to the frame A of the machine, and is provided with a screw, P, passing through a cross-bar, N, and into a tap-hole in the upper portion of the frame, by which means the frame may be raised and lowered in order to feed the cutter-head to and from the work. The shaft H, carrying the cutter-head G, is revolved rapidly by a belt passing around a pulley, *h*, or in any other suitable manner.

The bed B may be moved back and forth on the ways *a* by hand, or may be provided with any suitable mechanism for reciprocating it.

When the parts are arranged, as above described, with the face of the cutter-head properly adjusted to the surface of the veneers, the bed B is reciprocated upon the ways *a*, so as to carry the key-board back and forth under the rapidly-revolving cutter-head, by which means the surface of the veneer is dressed and smoothed to a uniform thickness throughout.

For the lateral adjustment of the movable clamping-bar D the following-described means may be employed: A shaft, Q, is arranged in bearings *q* on the under side of the bed B, and is provided with a suitable handle, $q^\times$, for turning it. The shaft Q carries two or more worms, R, the threads of which engage with the ends of the long arms of elbow-levers S S, pivoted to the under side of the bed B, or with studs projecting from said ends.

The threads of both worms may run in the same direction, and the levers may be arranged to oscillate parallel with each other; but, as shown herein, the threads are arranged to run in opposite directions, and the levers to oscillate toward and from each other, in order to facilitate the arrangement and operation, and also to prevent end thrust on the shaft Q. The short arms of the levers are connected to plates or bars T, which work in slots *t* in the bed B, and to the upper sides of which the movable bar D is attached.

When the shaft Q is turned in one direction or the other the engagement of the worms R with the levers S causes the long arms of said levers to oscillate toward or from each other, and their short arms to move toward one side or the other of the bed B, which movement is communicated to the bar D, so as to draw it toward the key-board to clamp it in place, or to move it away from the key-board to allow it to be removed from the bed. As the levers move simultaneously, the motion communicated to the bar D is uniform throughout its entire length, and the pressure of the bar against the key-board is uniform at all points.

In order to enable the movable bar D to be adjusted at different distances from the stationary bar C, to accommodate key-boards of different widths, the bar D is attached to the plates T by means of screws V, passing through slots *u* in said plates, and provided with nuts *v*, so that by loosening the nuts the bar may be moved to the desired position, and may be held in such position by again tightening the nuts.

What I claim as new, and desire to secure by Letters Patent, is—

1. The combination, with the bed B, of the clamping-bar D, constructed as described, whereby the key-board is supported by the projecting edges of the veneers resting upon said clamping-bar, substantially as and for the purpose set forth.

2. The combination, with the bed B, of the swinging frame J attached to the vertically-adjustable frame K, and provided with means for adjusting the cutter-head to the surface of the key-board, substantially as and for the purpose herein described.

3. The combination of the shaft Q, worms R, levers S, plates or bars T, and movable clamping-bar D, for laterally adjusting said clamping-bar, substantially as herein described.

MILON PRATT.

Witnesses:
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SAMUEL M. SHIPMAN.