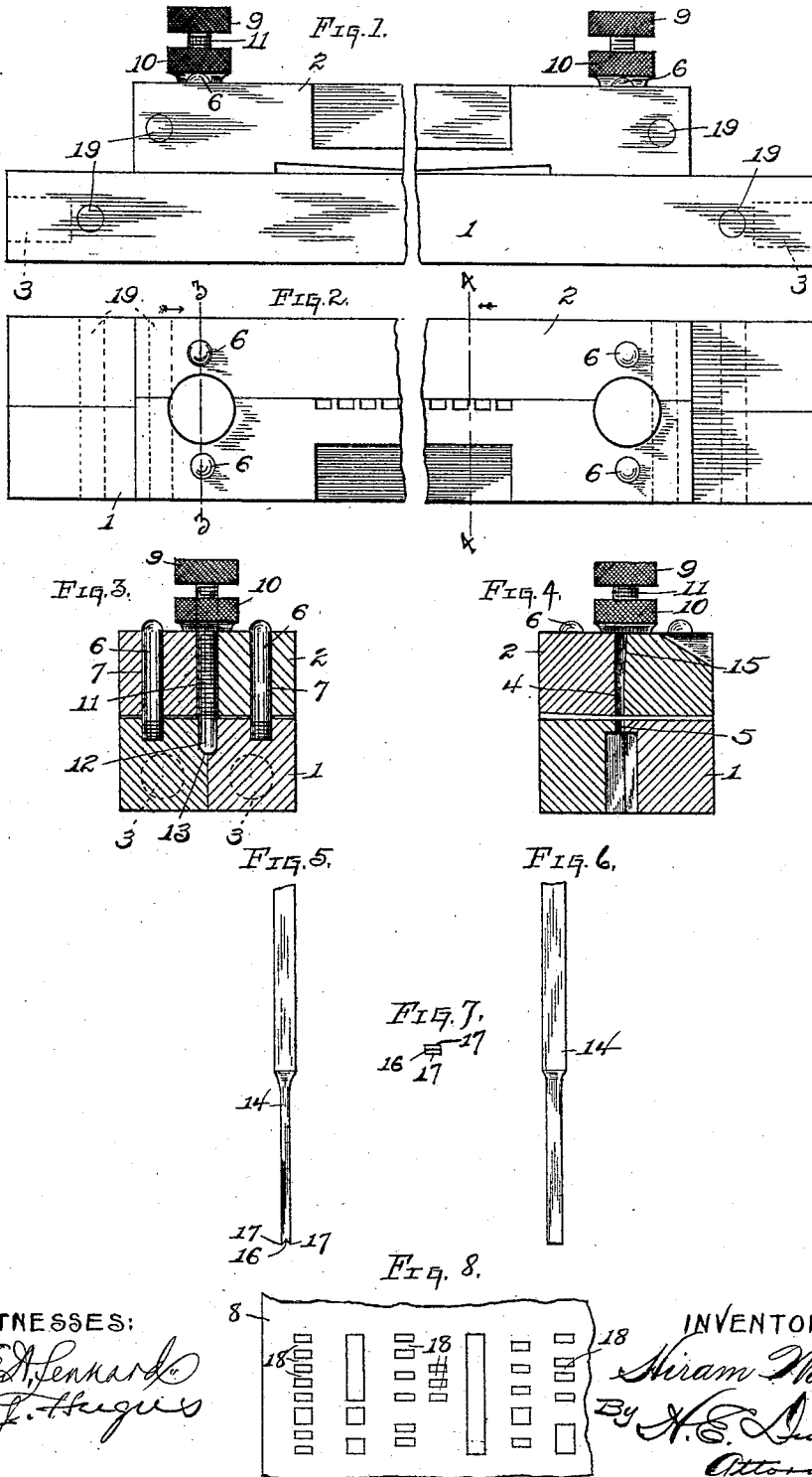


H. WALKER.
MUSIC ROLL PERFORATING MECHANISM.
APPLICATION FILED APR. 28, 1907.

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Patented Dec. 29, 1908.



WITNESSES:

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HIRAM WALKER, OF SISTERSVILLE, WEST VIRGINIA.

MUSIC-ROLL-PERFORATING MECHANISM.

No. 908,175.

Specification of Letters Patent.

Patented Dec. 29, 1908.

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To all whom it may concern:

Be it known that I, HIRAM WALKER, a citizen of the United States of America, and resident of Sistersville, county of Tyler, and State of West Virginia, have invented certain new and useful Improvements in Music-Roll-Perforating Mechanism, of which the following is a specification.

This invention relates to new and useful improvements in music-roll perforating mechanism, and more particularly to an improved form of punch and cooperating die therefor; and it consists in the particular construction, arrangement and combination of parts which will hereinafter be fully described.

The object of the invention is to provide a die and cooperating punches of the general character found in my pending application for Letters Patent, Serial No. 343,210, filed November 13, 1906, wherein provision is made for punching in the advancing sheet of paper oblong perforations instead of the usual circular perforations.

The diameter of the punching end of a punch must, of course, be such that the perforations produced thereby will be of sufficient area to admit of a key-operating volume of air therethrough when the roll is used upon a mechanical piano-playing instrument. The reciprocation of the punches in the perforating machine is so rapid and the travel of the paper is, comparatively speaking, so slow that when a series of perforations is formed by a punch having a circular end, as when a series of distinct notes is struck in rapid succession on the same key, said perforations either merge and combine to form a continuous slot in line with the direction of travel of the paper, or follow each other so closely that the intervening tie has no effect when the roll so perforated is employed on a mechanical piano player, thus resulting in sustained notes being produced instead of the desired distinct notes. In other words, on account of the large diameter of the circular perforations, when two or more distinct notes are struck in rapid succession on the same key—that is, when the same note is repeated one or more times—the spaces or ties, if any, intervening between the resultant perforations are so narrow that, when the roll is used on a mechanical player, a sustained note will be produced instead of the

desired series of distinct notes, said ties not being of sufficient width to close the holes in the tracker-board of said mechanical player sufficiently to cause the release of the key.

The chief object of the present invention is to provide a mechanism which will not only produce perforations of the requisite area, but which will also produce such a form of perforation that a succession thereof produced by a series of distinctly-struck notes, no matter how rapidly struck, will be so separated that said distinct notes will be perfectly reproduced when the roll so perforated is employed upon a mechanical piano player.

A further object of the invention is to provide a die and a punch-guide having improved means whereby they may be relatively adjusted.

In describing the invention in detail, reference is herein had to the accompanying drawing, forming a part of this specification, in which—

Figure 1 is a front elevation of the die and punch-guide; Fig. 2 is a top plan view of the same; Fig. 3 is a cross sectional view of the same on the line 3—3, Fig. 2; Fig. 4 is a similar view on the line 4—4, Fig. 2; Fig. 5 is an edge view of a fragment of a punch; Fig. 6 is a side elevation of the same; Fig. 7 is an end elevation of the same; and Fig. 8 is a plan view of a fragment of music roll.

Referring to said drawing, in which like reference-numerals designate like parts throughout the several views 1 indicates the die and 2 the punch-guide, the former having holes 3 in its opposite ends into which securing-bolts are projected for attaching the die to an appropriate portion of the machine.

The punch-guide 2 is adjustably mounted upon the die 1 in such manner that their respective die-holes 4 and 5 register perfectly at all times irrespective of their relative vertical positions. Guide-pins 6 which are rigidly mounted in the upper face of said die near its opposite ends fit snugly in holes 7 provided at suitable points in the ends of said guide 2, said pins being adapted to hold said die and guide against lateral movement in either with respect to the other when said guide has been adjusted

vertically to any position to admit of the passage therebetween of one or more sheets 8 of paper.

The adjusting means for the guide 2 consists of a vertical adjusting-screw 9 provided at each end of said guide, and a locking-nut 10 carried by each screw. The body 11 of each screw 9 is threaded, while the point 12 is plain, a socket 13 being provided in the upper face of the die for the reception of said point. As is obvious, the weight of the punch-guide is wholly borne by the points 12 of the adjusting screws 9 mounted in the sockets 13, and the relative positions of the adjusting screws and the die remain unchanged, no matter what the relative positions of said die and punch-guide may be.

When it is desired to adjust the guide 2 with respect to the die 1, the adjusting screw 9 is turned forward or rearward to respectively raise or lower the guide, the latter sliding upon the pins 6. The locking-nut 10 is screwed down along the body 11 of the adjusting screw to bind upon the upper face of the guide 2 to hold the latter firmly in adjusted position.

In the die 1 is provided a series of alined die-holes or punch-holes 5 which are long and narrow and preferably rectangular in form, as shown, but which may be oval or of any oblong form desired. The lengths of said holes 5 are in line with the length of the die. In the punch-guide is also provided a series of alined punch-holes 4 precisely similar in size and form at their lower ends to the holes 5 in the die and registering precisely therewith, said holes 4 serving as guides for directing the punches 14 through the advancing sheet into the holes 5.

The punches 14 are never wholly dissociated from the punch-guide 2, the lower ends of the former normally standing in the upper ends of said holes 4. Said punches normally stand in forwardly-inclined positions, and a forwardly-directed bevel 15 is therefore provided at the upper end of each of said holes 4 for admitting of such inclination in the punches.

The punching ends of the punches correspond in size and form with the die-holes 5 so that they fit snugly therein. Extending lengthwise of the face of the lower end of each punch is a V-shaped groove 16, the introduction of which in said end constitutes two oppositely-disposed sharp cutting edges 17 adapted for producing a clean-cut perforation in the paper 8.

The perforation formed in the music roll is of substantially the size and form of the rectangular openings or holes in an ordinary tracker-board—that is, long and narrow—as shown in Fig. 8. Owing to the limited width of the perforations, when two distinct notes are struck by two distinct depressions

of a key of the punch-actuating instrument, the perforations produced thereby are so widely separated that the two distinct notes will be perfectly reproduced when the roll is employed upon a mechanical player.

Since the paper 8 is continuously advancing between the die and the punch-guide at a rapid rate of speed, it is beyond the physical capacity of a performer upon a piano, when the punches of the character described are employed, to strike successive distinct notes which may not be perfectly reproduced, the tie between the perforations produced by such distinct notes being wide enough to close the holes in the tracker-board of the mechanical player when the roll is employed thereon.

Referring to Fig. 8, the ties designated 18 are substantially the narrowest possible to form between perforations produced by successively striking distinct notes on the same key of the actuating instrument. As is obvious, if circular perforations of an area equal to that of the rectangular perforations shown were employed, said circular perforations would follow each other so closely—that is, they would be separated by such a narrow tie—when rapidly succeeding notes were struck that said notes would not be separately reproduced by a mechanical player, but a sustained note would be produced instead.

A further advantage is attained in that the relatively wider ties intervening between the perforations produced by such distinctly struck notes are less easily torn in handling the rolls or sheets of paper. And, as a result of the construction hereinbefore set forth, a greater number of distinct notes may be recorded on the roll in a given space than is possible when the circular perforations are employed.

The die 1 and punch-guide 2 are each preferably composed of two longitudinal companion bars whose inner faces coincide perfectly, said bars being firmly secured together, as by rivets 19, as shown.

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

1. In a device of the character described, the combination with a plurality of punches, of a die and a punch-guide, each having a plurality of punch-holes therein, said punch-guide being mounted over said die with its punch-holes in register with the holes in the latter, adjusting screws projected vertically through said punch-guide, the points of said screws being unthreaded and resting in sockets provided in said die, and means whereby the registration of the punch-holes in the die and the punch-guide is maintained through all degrees of relative adjustment.

2. In a device of the character described, the combination with a plurality of punches,

of a die having a plurality of punch-holes therein, a punch-guide having a plurality of punch-holes therein, said punch-guide being mounted on said die with its punch-holes in register with the holes in the latter, adjusting screws projected vertically through said punch-guide, the points of said screws being unthreaded and resting in sockets provided in said die, and vertical guide-pins rigidly mounted in said die whereby the punch-guide is held against lateral movement and the registration of the punch-holes in the die and in the punch-guide is maintained through all degrees of adjustment of the latter.

3. In a device of the character described, the combination with a plurality of punches, of a die and a punch-guide, each having a plurality of punch-holes therein, said punch-guide being mounted on said die with its punch-holes in register with the holes in the

latter, adjusting screws projected through said punch-guide, the points of said screws being unthreaded and resting in sockets provided in said die, locking-nuts carried by the bodies of said screws and adapted to impinge upon the punch-guide to hold the latter in adjusted position, and vertical guide-pins mounted in said die and projected through said punch-guide whereby the latter is held against lateral movement and the registration of the punch-holes in the die and in the punch-guide is maintained through all degrees of adjustment of the latter.

In testimony whereof I affix my signature in presence of two subscribing witnesses.

HIRAM WALKER.

Witnesses:

MINNIE AUSHUTZ,
MYRTLE GRUBER.