No. 671,724. Patented Apr. 9, 1901.

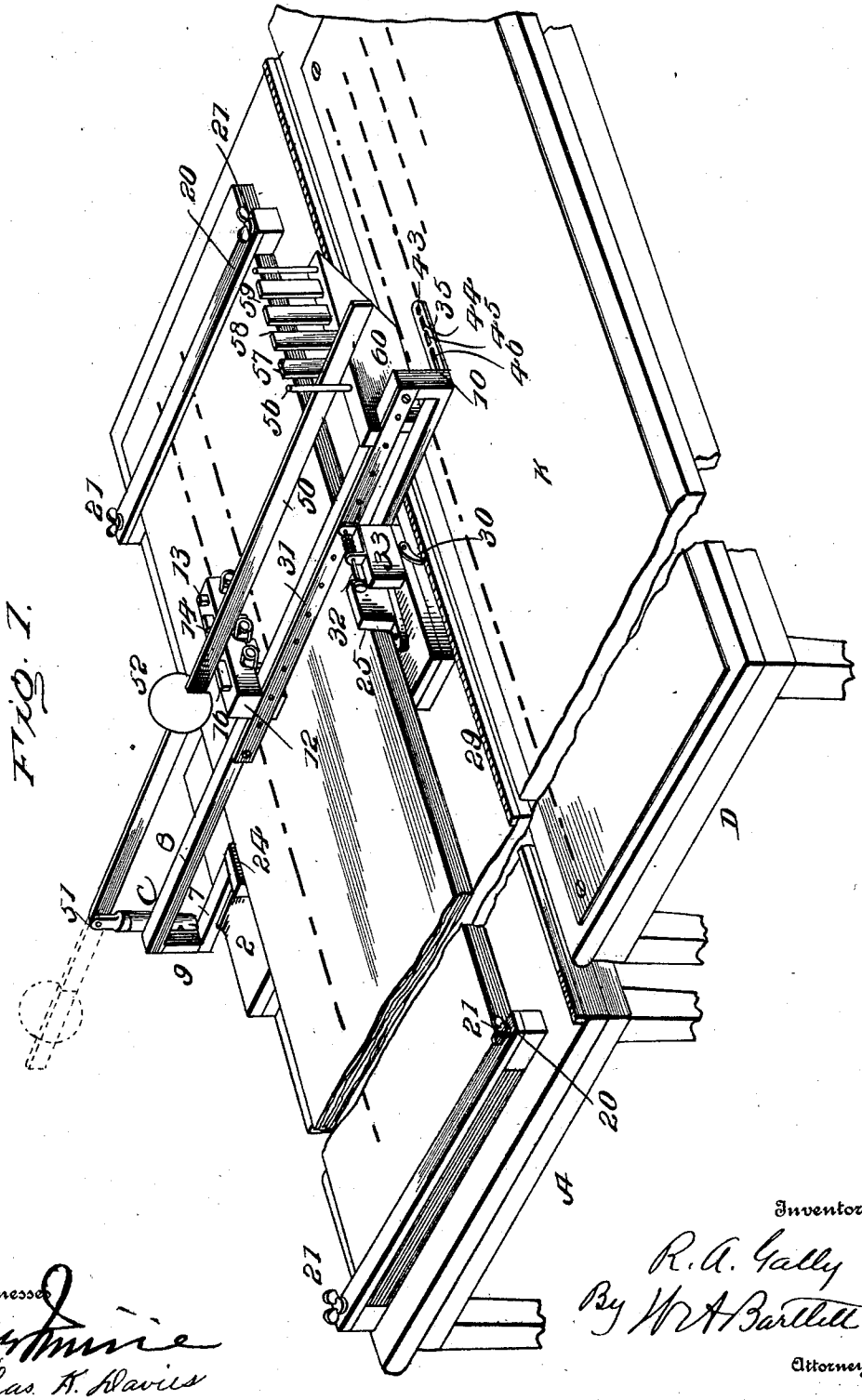
R. A. GALLY.

MACHINE FOR PERFORATING MUSIC SHEETS FOR SELF PLAYING INSTRUMENTS.

(Application filed Sept. 7, 1900.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.



Witnesses:
Chas. A. Davies

Inventor
R. A. Gally
By W. A. Barlett.
Attorney

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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R. A. GALLY.

MACHINE FOR PERFORATING MUSIC SHEETS FOR SELF PLAYING INSTRUMENTS.

(Application filed Sept. 7, 1900.)

(No Model.) 2 Sheets—Sheet 2.

FIG. 2.

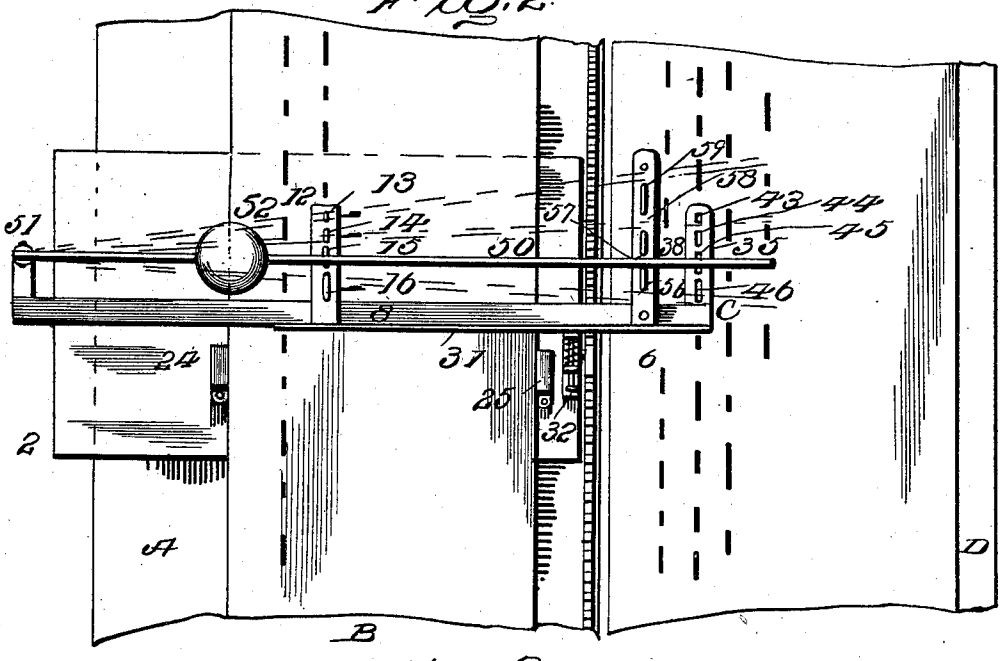
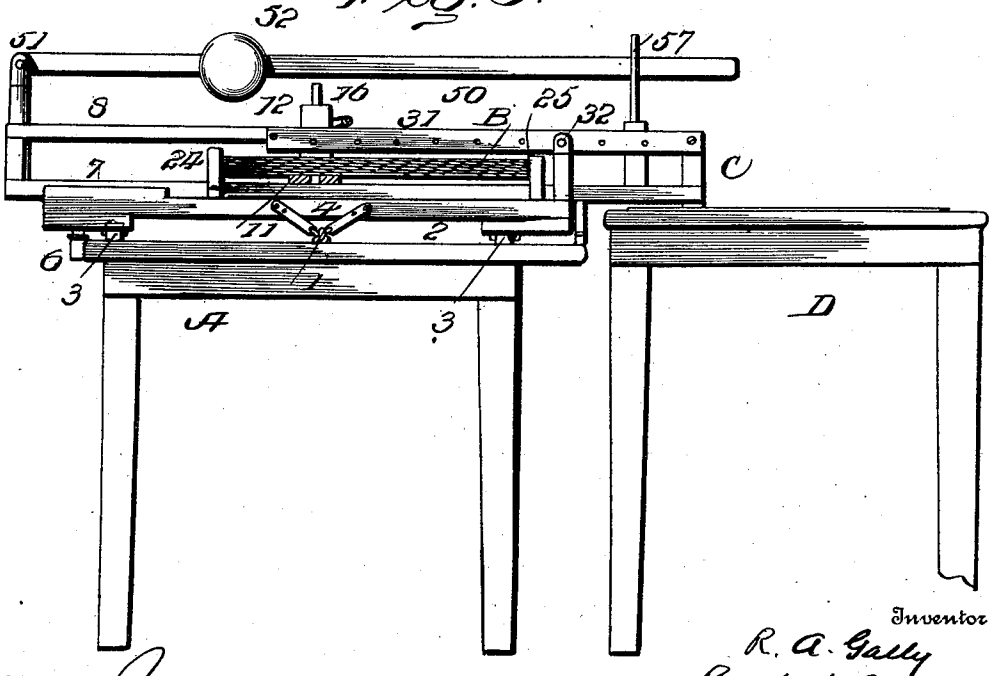


FIG. 3.



Witnesses
Jno. Purcell
Chas. K. Davies.

Inventor
R. A. Gally
By W. A. Bartlett
Attorney

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

ROBERT A. GALLY, OF BROOKLYN, NEW YORK.

MACHINE FOR PERFORATING MUSIC-SHEETS FOR SELF-PLAYING INSTRUMENTS.

SPECIFICATION forming part of Letters Patent No. 671,724, dated April 9, 1901.

Application filed September 7, 1900. Serial No. 29,296. (No model.)

To all whom it may concern:

Be it known that I, ROBERT A. GALLY, residing at Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Machines for Peforating Music-Sheets for Self-Playing Instruments, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to manually-operated perforating-machines for perforating music-sheets adapted for automatic musical instruments.

The object of the invention is to produce a machine which may be operated wholly or in part by hand to produce from a copy a limited number of perforated music-sheets; and the invention consists in certain mechanical constructions and combinations, as herein described.

Figure 1 is a broken perspective view of the machine and supporting-table and paper sheets, together with the table for copy and a copy-sheet thereon. Fig. 2 is a plan of the machine proper, with broken parts of the work and copy. Fig. 3 is an end view showing the machine and its immediate adjuncts in elevation.

A indicates a table or bench on which there is a longitudinal track or guide-rail 1. A light platform-carriage 2, supported on wheels or rollers 3, is constructed to move lengthwise of the table, the guards 4 compelling the platform to follow the straight line of track 1 as it is moved back and forward on wheels 3. The table and carriage may be of wood. A bearing-roll 6 may further assist in guiding the carriage on the table. The carriage 2 has a guide-groove on its upper face extending in a direction transverse to track 1, and in this groove lies the bottom bar 7 of a parallelogram frame C, the ends of the bars 7 8 being connected by standards 9 and 10 to form this frame. The frame C may be integral or of riveted bars or other convenient construction. The lower bar 7 bears a female die or block 11 and the upper bar a punch-block 12. In the upper block a series of punches 13 14 15 16 is arranged, and the die-block below has holes corresponding with the punches. The punches are lifted by springs, as is common with punches. The punches 13 to 16, more or less in number, are of the same thickness, but differ in width. Thus if there be four punches they may conveniently be one-eighth, one-fourth, one-half, and one inch in width, and the female die will be provided with holes exactly corresponding with the width of punches and directly under the punches, so that the punches may be driven down into the die-holes, but will be normally lifted out by springs.

At or near each end of the table A are paper-clamps 20, which clamps are merely bars provided with screws or other means 21 for clamping the paper sheets and holding them firmly. Paper sheets B—say twelve or more in thickness—are stretched and firmly held in the clamps 20, the entire number of sheets then passing between the bars 7 8 of the frame or yoke C and below the punches, but above the die-block 11. The lowermost sheet thus rests on die-block 11 and is held taut. Gages 24 25, attached to the carriage and adjustable thereon by any usual means, hold the paper from shifting laterally, while the end clamps 20 hold the sheets against endwise movement. The carriage 2 can be shifted lengthwise nearly the whole length of the paper sheets or of the parts of sheets between clamps 20, while the frame C can be shifted laterally relatively to the paper sheets, sliding on carriage C. A rack-bar 29 on the table, extending the length thereof, is engaged by a pawl 30, and so prevents a "backing" of the carriage and secures a stated step-by-step forward movement when desirable. The pawl is lifted by hand when desirable to back the carriage. The step-by-step movement is a convenience, not a necessity. The teeth of the rack are preferably of the length of the shortest cut. An expert operator can discard the ratchet altogether. To a beginner the click of the ratchet is an assistance in calling attention to the amount of movement of the carriage.

A gage-bar 31 on frame-bar 8 has notches or perforations arranged at distances between lines of holes in the music-sheet or holes in the tracker with which the music-sheet is used. A gage-pin 32, connected to projection 33 on the carriage, enters one of the holes in bar 31 and when so entered prevents the movement of the frame C transversely of the

paper; but a removal of the gage-pin permits the frame to be moved sidewise of the paper and again fastened by the pin in position to bring the punches in line for a new row or range of holes. This mechanism thus constitutes a "setting-gage" for frame C.

Table D, alongside table A or even a part thereof, bears the copy K, and frame C is long enough to extend over this copy. On the lower edge of frame C, directly above the copy, there is a transparent guide 35, marked with indexes 43 44 45 46 of the size and shape of the punches and, as shown, corresponding with the punches in their projection at the side of frame C. The guide 35 may be a strip of celluloid, with the indexes marked thereon. Guide 35 has the same relation to the copy K that the punch-block 12 has to the paper B to be perforated, and the indexes 43, &c., marked on the guide 35 correspond with the punches 13, &c. The copy shows either marks or perforations corresponding to the perforated music. One perforated sheet is a perfect copy from which to work. The copy being clamped to its table in the desired relation to the sheets B, the gage 35 is moved to lie above a line of marks in the copy. The punches will then occupy a corresponding position relatively to sheets B. The marks or perforations on the copy are of uniform width, but varying length, being mostly multiples in length of the width of shortest punch—say one-eighth, one-fourth, one-half, one, two, and several inches in length. If the gage be set to a line of marks on the copy and one of the marks on the guide be brought above a mark on the copy, (by moving the carriage,) the punches will then be above the corresponding line on sheet B. Now if the mark be the shortest one the carriage will be pushed along until index 43 comes above said mark on the copy. Then if punch 13 be driven down all the sheets B will be perforated to correspond; but if the copy shows a wide mark or hole the carriage is moved until the leading edge of a long index—say index 46—is brought over the pattern, when punch 16 will be used to cut. If the perforation be longer than this punch, successive cuts can be made until the desired length of slot is produced. A blow from a mallet on the proper punch would cut the paper; but for convenience I have a striker 50, loosely pivoted at 51 to frame C or a connection thereof and extending lengthwise of the frame. This striker 50 may project beyond its pivot and be counterweighted, (dotted lines, Fig. 1.) The striker has a weight 52 if not sufficiently heavy otherwise. Its body can be moved over any one of the punches. Striker-guides 56 57 58 59 project from block 60, attached to frame C, and serve to guide the striker 50 in its vertical movement. The operator having moved the carriage until gage 35 lies above the line of marks indicating position of holes to be cut, looks down through the transparent guide and readily selects the index-mark appropriate in size and moves this index over the mark on copy, which carries the proper punch to its cutting position. The operator then lifts striker 50 and brings it down between the proper striker-guides 56 57, &c., when the striker hits the punch and forces it through the paper B. Then the carriage is moved along and the blow repeated. When a line of perforations as long as can be conveniently worked between clamps 20 has been punched, the frame C is slipped sidewise one space and another line punched in similar manner. Thus a length of paper reaching from clamp to clamp may be punched, when the copy and paper sheets may be moved lengthwise, reclamped, and another section punched.

So far as I am aware this is the first hand-operated machine, other than hand-punches, for punching music-sheets. It is adapted for the production of first or trial copies and editions of music too small to warrant the expense of the well-known power-machines.

What I claim is—

1. In a machine for perforating music-sheets, a supporting-table and guide-track, a hand-operated carriage in position to move lengthwise on said table, a laterally-movable frame on the carriage, and a punch and die-block carried by the frame and having a plurality of punches varying in width, in combination substantially as described.

2. In a machine for perforating music-sheets, the combination of the supporting-table, the carriage movable lengthwise thereof, and the frame movable laterally on the carriage, of a plurality of punches varying in width carried by the frame, and a guide carried by the frame and movable to position to bear the same relative position to the copy that the corresponding punch does to the work, substantially as described.

3. In a machine as described, the table and paper-clamp, a carriage, and a laterally-movable frame carrying a plurality of punches varying in size above and die-block below the paper, said frame movable in right lines relatively to the paper.

4. In a machine as described, the carriage and frame carrying punches, and the transparent guide connected to the frame, having indexes corresponding in size to the punches.

5. In a punching-machine as described, the table and paper-clamps, the longitudinally-movable carriage, the laterally-movable frame carrying punches, and a rack-and-pawl mechanism to prevent back movement of carriage, and secure a step-by-step movement.

6. In a carriage as described, the table and carriage, a laterally-movable punch-carrying frame, and a setting-gage by which the frame may be held in adjusted position relatively to any given line of indications of the pattern.

7. In a machine as described, the movable frame having a plurality of punches varying in size and movable by right lines to any position over the work, a gage by which any of

the punches may be adjusted to position corresponding to the pattern indication, and a striker loosely connected to the frame and movable to any one of the punches, to strike the same when operated, substantially as described.

8. In a machine as described, a movable frame carrying several punches, a striker loosely connected to the frame and movable to position to operate on any one of the punches, a gage connected to the frame and movable to position relatively to the pattern to control the position of any punch, and striker-guides, by which the blow of the striker is directed to the proper punch.

9. In a machine as described, the table and lengthwise-moving carriage, the transversely-movable frame and punches carried thereby, the transparent gage carried by said frame, and a striker loosely connected to the frame in position to engage any one of the punches.

10. In a machine as described, the table and clamps, the carriage moving lengthwise on said table, the frame movable crosswise of the carriage and carrying punches and a gage, and the striker connected to the carriage and guided to one of the punches, all combined substantially as described.

11. In a machine of the character described, a table and means for clamping the paper thereon, a pattern arranged in proximity to the paper, a carriage having a lengthwise movement relatively to the paper, a frame having lateral movement relatively to the paper and carrying a punch, an index connected to the carriage and movable therewith to any position relatively to the pattern, and means for adjusting and securing the punch in desired position relatively to the index, all combined substantially as described.

12. In a music-cutter as described, a paper-clamping table, a carriage longitudinally movable thereon, a frame laterally movable on the table and carrying the paper-punch, a pattern and index substantially as stated, and means for preventing back movement of the carriage, all combined substantially as described.

13. In a machine for perforating or punching music-sheets, the combination of a plurality of punches carried by a frame movable in all directions, and a guide connected to the frame and having fixed relation to the punches, so that the punches conform relatively to the position of the guide.

14. In a machine as described, the frame movable in all directions over the paper, a plurality of punches carried by the frame, and a gage provided with indexes corresponding to the punches, and connected to the frame to cause the punches to assume a corresponding relation to the work that the indexes bear to the copy.

15. A perforating-machine having a series of punches movable in all directions in a horizontal plane, paper-clamping mechanism to hold a sheet under the punches, a table having place for copy corresponding to the sheets to be perforated, and a guide connected to the punch-carrier and movable relatively to the copy.

16. In combination with the paper-table, paper-clamps, and carriage movable on the table, the gages on the carriage bearing against the edges of the clamped sheets, substantially as described.

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

ROBERT A. GALLY.

Witnesses:
C. OSCAR BERGSTROM,
FLINT W. WRIGHT.