No. 733,016. PATENTED JULY 7, 1903.

L. B. DOMAN.

# DEVICE FOR TRIMMING PERFORATED MUSIC SHEETS.

APPLICATION FILED SEPT. 25, 1902.

NO MODEL.

Fig. 1.

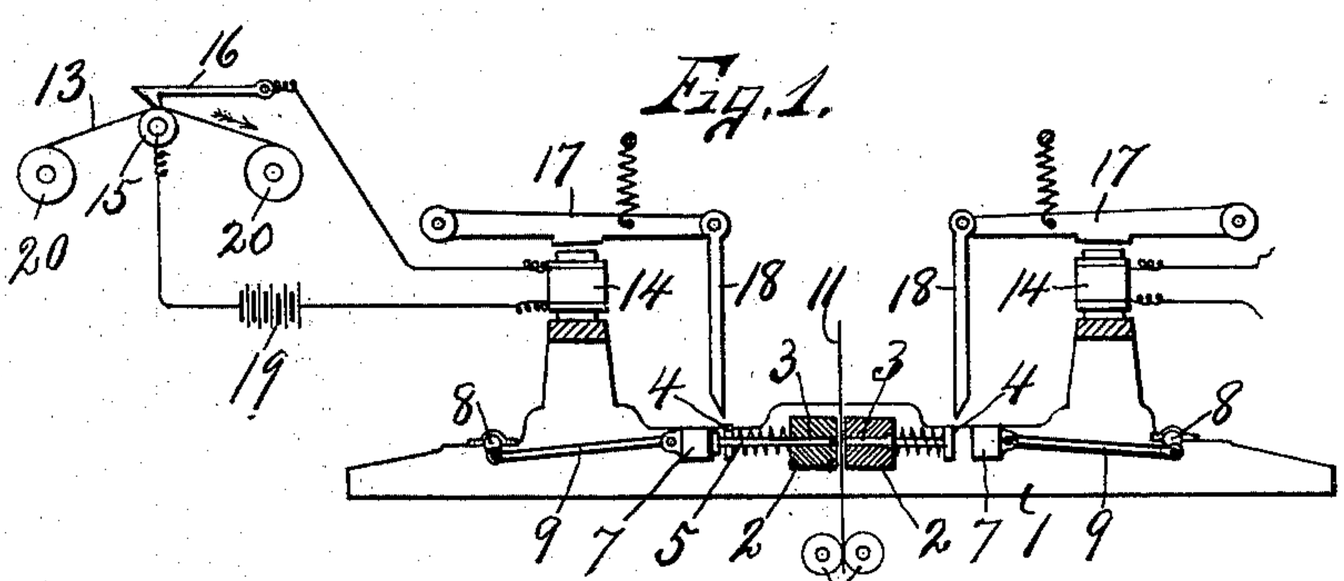



Fig. 2.

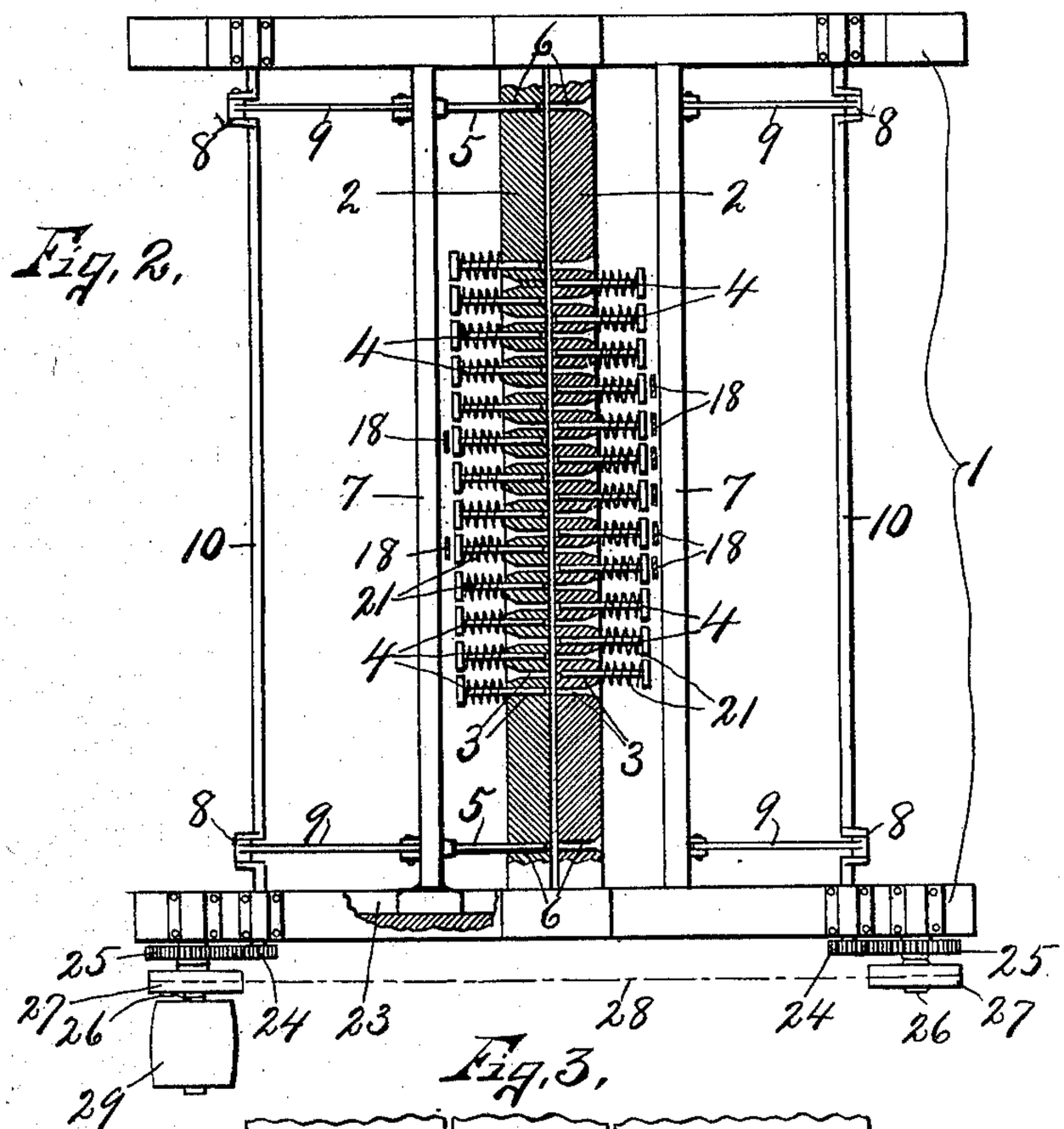
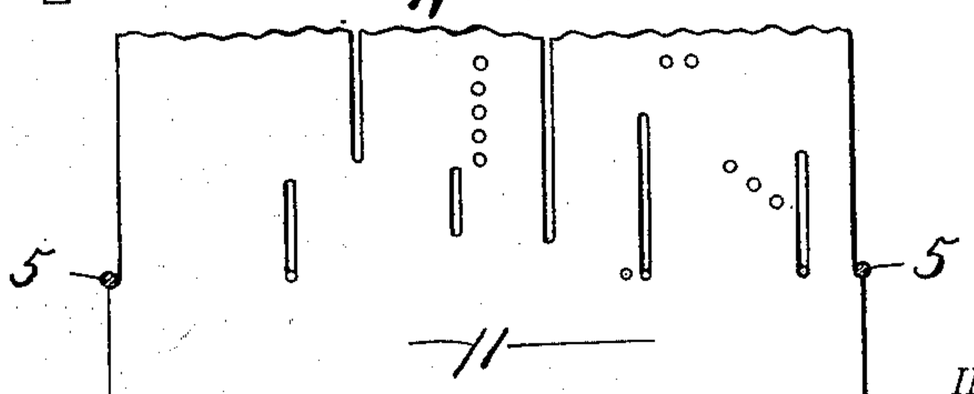



Fig. 3.

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No. 733,016. Patented July 7, 1903.

# UNITED STATES PATENT OFFICE.

LEWIS B. DOMAN, OF ELBRIDGE, NEW YORK, ASSIGNOR TO THE MAESTRO COMPANY, OF ELBRIDGE, NEW YORK, A CORPORATION OF NEW YORK.

## DEVICE FOR TRIMMING PERFORATED MUSIC-SHEETS.

SPECIFICATION forming part of Letters Patent No. 733,016, dated July 7, 1903.

Application filed September 25, 1902. Serial No. 124,756. (No model.)

*To all whom it may concern:*

Be it known that I, LEWIS B. DOMAN, of Elbridge, in the county of Onondaga, in the State of New York, have invented new and useful Improvements in Devices for Trimming Perforated Music-Sheets, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

This invention relates to apparatus for perforating and trimming music-sheets, and refers more particularly to the trimming mechanism for sizing the sheets widthwise.

The object of my invention is to trim the edges of the music-sheet by means of rapidly-reciprocating cutters coöperating with suitable dies simultaneously with the perforating of the music-sheet.

To this end the invention consists in the combination and arrangement of the parts of a music-sheet-trimming mechanism, as hereinafter fully described, and pointed out in the claims.

Referring to the drawings, Figure 1 is an end elevation of a perforating and trimming mechanism embodying the features of my invention, means for controlling the operation of the perforating devices being illustrated. Fig. 2 is a top plan, partly in section, of the perforating and trimming mechanism seen in Fig. 1. Fig. 3 is a fragmentary view of a portion of a music-sheet, the trimming members being shown in section.

In order to clearly demonstrate the operation of my invention, I have shown in the drawings a frame 1, parallel bars 2, having apertures 3, perforating-plungers 4, movable in said apertures, additional plungers or cutters 5, located at the opposite ends of the bars 2 and movable in apertures 6, reciprocating bars 7, movable toward and away from the bars 2, means, as crank-arms 8 and connecting-rods 9, for reciprocating the bars 7, and driving mechanism for rotating shafts 10, upon which the eccentrics 8 are mounted.

Movable between the bars 2 and also between the adjacent ends of the plungers 4, which are mounted in said bars, is a music-sheet 11, which is moved lengthwise or drawn between the bars 2 by suitable feeding-rollers 12, these feeding-rollers being adapted to be operated by any desirable mechanism, not necessary to herein illustrate or describe.

The frame 1 may be of any desired construction adapted to support the parts of my invention, the dies or bars 2 being usually mounted upon the frame in fixed relation to each other, and the plungers 4 are capable of reciprocal movement in their respective apertures 3 for perforating the music-sheet, the operation of these plungers being controlled by suitable mechanism hereinafter described.

The reciprocally-movable bars 7 are common to all of the plungers 4, and the heads of the plungers adjacent to their respective bars are separated therefrom a sufficient distance to permit the full reciprocal movement of the bars 7 without effecting the operation of the plungers, and in order to control the operation of these plungers 4 to perforate the music-sheet at predetermined intervals to represent the notes of a musical composition I provide a stencil 13, electromagnets 14, contact devices or terminals 15 and 16, and armatures 17, having fingers 18, adapted to be inserted between the heads of their respective plungers 4 and reciprocating bars 7, it being understood that each plunger is provided with a corresponding finger 18, magnet 14, armature 17, and terminal 16.

The magnets 14 and terminals 15 and 16 are connected to any desired source of electric energy, as a battery 19. The stencil 13 usually consists of a perforated music-sheet corresponding to that which it is desired to reproduce and is mounted in any desired manner upon feeding-rolls 20, driven by suitable mechanism, not necessary to herein illustrate or describe, it being sufficient to state that the stencil is fed in one direction (indicated by the arrow, Fig. 1,) between the terminals 15 and 16, the terminals 16 serving as trailers to close the circuit through the magnets 14 when the apertures in the stencil are registered with the trailing end of the terminal 16. This closing of the circuit through the magnet 14 energizes the armature 17 and forces the finger 18, connected thereto, between the reciprocal bar 7 and the head of the plunger, which may be in alinement with said finger. This interposition of the finger 18 transmits motion from the bar 7 to the

plunger, which may be registered with the finger for forcing the plunger inwardly and perforating the music-sheet between the bars 2, said plungers being returned to their normal positions by springs 21. This method of perforating the music-sheet to correspond with the stencil is not, however, the essential feature of my invention, the trimming-plungers 5 forming more particularly the subject-matter of this application. Although I have described a specific means for operating the trimming-plungers 5, it is evident that any other means may be employed for operating reciprocating cutters or plungers to trim the opposite edges of the sheet, so that the sheet will be uniform in width and the edges of the music-sheet will always have the same position relative to the perforations representing the notes of the musical composition. In order that this purpose may be more effectively carried out, I arrange the plungers 5 in substantially the same plane with the perforating-plungers 4. These plungers 5 are shown as mounted upon one of the bars 7 and operate to cut or trim the edges of the sheet at each reciprocal movement of said bar, and in order that the plungers may be held in proper position without unduly straining the same I mount the opposite ends of the bar to which said plungers are secured in suitable ways 23, Fig. 2. As previously stated, these reciprocal bars 7 are connected by links 9 to eccentrics 8, mounted upon the shaft 10, and it is imperative that these plungers reciprocate as rapidly as possible to prevent mutilation of the music-sheet during its movement between the bars 2 and while they are being operated upon by the perforating and trimming plungers, and in order to demonstrate this rapid movement I have shown the shafts 10 as provided with pinions 24, which mesh with gears 25 of much larger diameter, these gears being mounted upon spindles 26, having pulleys 27, connected by a driving-belt 28, so that both shafts 10 and bars 7 are operated simultaneously, one of the spindles 26 being provided with a pulley 29, which may be connected to any source of power (not illustrated) for driving the spindles 26 and shafts connected thereto at the desired speed.

Although I have previously stated that the perforating-plungers are not an essential feature of this invention, yet it will be noted that the relative arrangement of the plungers 5 with the plungers 4 is an important feature, owing to the fact that by arranging the plungers 5 in the same plane with the plungers 4 there is more certainty of the edges of the sheet being trimmed uniformly with relation to the perforations representing the notes of the musical composition, the advantage of this being that when the music-sheet is placed in the automatic playing apparatus the flanges of the winding and rewinding rollers, upon which the music-sheet is usually mounted in the playing apparatus, serve as guides for the edges of the music-sheet, and therefore assure the proper registration of the perforations in the music-sheet with the air-ducts of the pneumatic bridge, which is also employed in said automatic playing apparatus.

In the operation of my invention one end of the music-sheet is drawn between the bars 2 and engaged by the feeding-rollers 12, the stencil being previously placed in position upon the rollers 20, and both sets of rollers are then operated at about the same time and travel at about the same rate of speed, the driving mechanism for the shafts 10 being also set in motion either before or after the sheet is engaged by the feed-rollers 12. The whole device being now in action, as soon as the perforation in the stencil 13 is registered with the trailer 16 said trailer contacts with the terminal 15 and closes the circuit through the magnet 14, which is then energized and actuates the armature 17 to force its finger 18 between one of the plungers 4 and the adjacent face of one of the reciprocating bars 7, whereupon the plunger is forced inwardly to perforate the music-sheet. This motion being intermittent and rapid and the movement of the music-sheet being slow, it is evident that if a long perforation is present in the stencil the finger 18 is held continuously between the bar 7 and the plunger and the reciprocal movement of the plunger 4 is continued as long as the finger 18 is depressed for forming a similar elongated opening in the music-sheet. The intermittent action of the plungers 5 is, however, independent of the stencil, this action taking place at each forward movement of the bar 7, to which said plungers are secured, and therefore these plungers are continually acting upon the music-sheet to trim the edges and to draw the same widthwise, and being alined with the plungers 4 and having a fixed relation thereto it is evident that the edges of the sheet will be trimmed uniformly and evenly and always at the same distance from any particular perforation formed by the plungers 4.

The operation of my invention will now be readily understood upon reference to the foregoing description and the accompanying drawings, and it will be noted that the essential features of my invention are, first, the trimming of the edges of the music-sheet by reciprocating cutters or plungers, and, second, the alinement of said plungers with the perforating-plungers. Otherwise the mechanism employed to operate these plungers may be considerably varied from what is shown and described without departing from the spirit of this invention.

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

1. A trimming device for music-sheets comprising a die and plunger located at opposite sides of one edge of the sheet, means to reciprocate the plunger to cut and size the

sheet widthwise and separate means to move the sheet endwise.

2. A trimming device for music-sheets comprising dies and rapidly-reciprocating cutters acting on the edges of the sheet to size the same widthwise, means to actuate the cutters, and additional means to feed the sheet endwise.

3. In combination with devices for perforating a music-sheet, reciprocating cutters for trimming the edges of the sheet, means to actuate the perforating devices and cutters, and separate means to feed the sheet endwise.

4. In combination with a perforating mechanism for music-sheets said mechanism including reciprocating plungers to form the perforations, additional plungers for cutting the edges of the sheet and sizing the same widthwise, means to actuate the plungers and additional means to move the sheet endwise.

5. In combination with a series of perforating-plungers for perforating a music-sheet, means to control the operation of the plungers, additional plungers alined with the former plungers and operating to cut the edges of the sheet and size the same widthwise, means to actuate the additional plungers, and separate means to feed the sheet endwise.

In witness whereof I have hereunto set my hand this 13th day of September, 1902.

LEWIS B. DOMAN.

Witnesses:
MILDRED M. NOTT,
HOWARD P. DENISON.