(No Model.) 2 Sheets—Sheet 1.

J. MAXFIELD.

MACHINE FOR PERFORATING MUSIC SHEETS FOR MECHANICAL MUSICAL INSTRUMENTS.

No. 330,913. Patented Nov. 24, 1885.

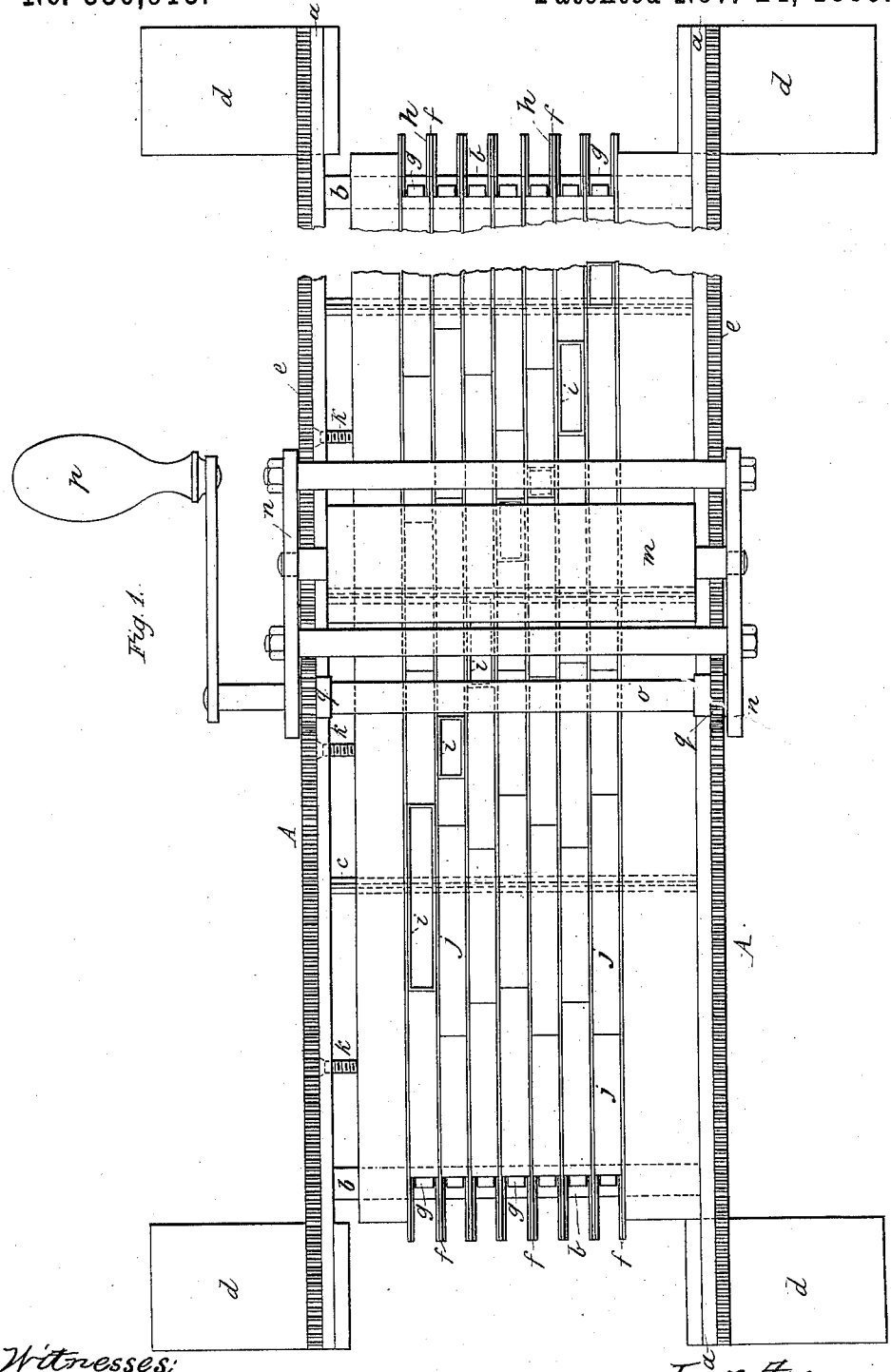


Fig. 1.

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(No Model.) 2 Sheets—Sheet 2.

J. MAXFIELD.

MACHINE FOR PERFORATING MUSIC SHEETS FOR MECHANICAL MUSICAL INSTRUMENTS.

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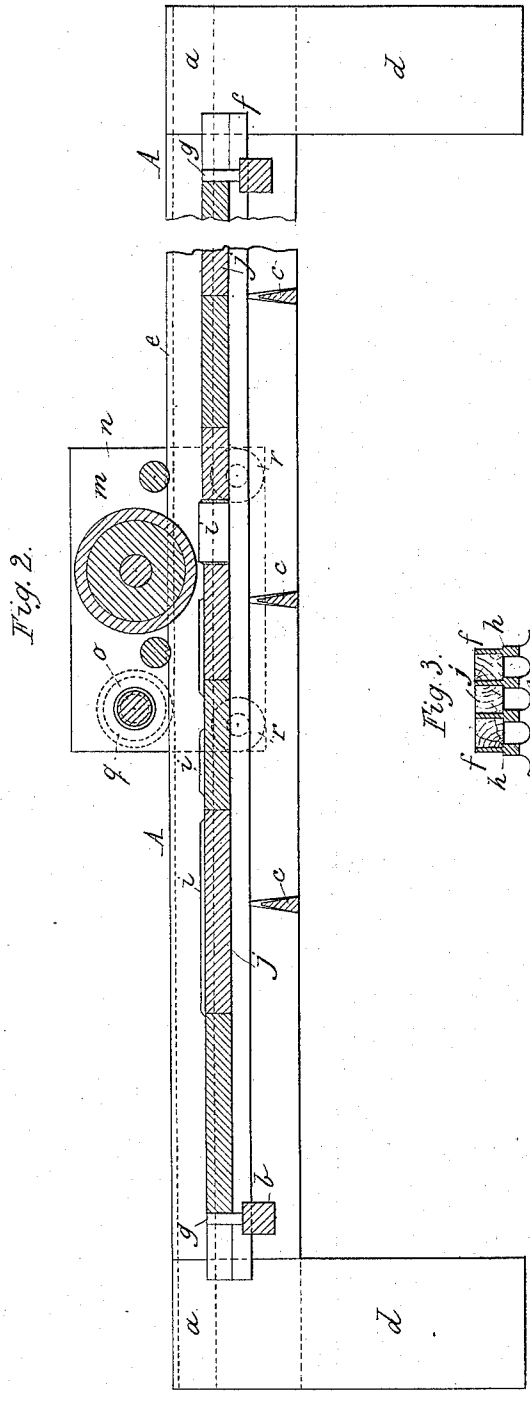


Fig. 2.

Fig. 3.

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UNITED STATES PATENT OFFICE.

JOHN MAXFIELD, OF LONDON, ENGLAND.

MACHINE FOR PERFORATING MUSIC-SHEETS FOR MECHANICAL MUSICAL INSTRUMENTS.

SPECIFICATION forming part of Letters Patent No. 330,913, dated November 24, 1885.

Application filed October 25, 1884. Serial No. 146,503. (No model.) Patented in England April 16, 1884, No. 6,432.

To all whom it may concern:

Be it known that I, JOHN MAXFIELD, a subject of the Queen of Great Britain, residing at London, England, have invented new and useful Improvements in and relating to Machines for Perforating Paper or other Material to be Used as Music-Sheets or Tune-Bands in Machanical Musical Instruments, (for which I have obtained a patent in Great Britain, No. 6,432, bearing date April 16, 1884,) of which the following is a specification.

My invention relates to the perforation of paper or other material for the music-sheets or tune-bands of mechanical musical instruments.

The said invention consists, chiefly, in the combination of a bed with punches or cutters arranged thereon correspondingly to the openings in a music-sheet for playing a given tune and a roller which forces a sheet against said punches.

My invention further consists in certain details of construction and arrangement hereinafter particularly set forth and claimed.

In the accompanying drawings, Figure 1 is a top view or plan of a machine for perforating paper or other material according to this invention. Fig. 2 is a central longitudinal section of the same, and Fig. 3 is an end view of some of the cutter or punch supporting bars.

Similar letters of reference indicate corresponding parts throughout the drawings.

A indicates the frame or bed for carrying the cutting-punches, and is composed of the longitudinal bars *a* and the transverse bars *b c*. This bed is supported on suitable lugs, *d*. To the longitudinal bars *a* are attached or formed integral therewith racks *e*, for a purpose hereinafter described, and upon the transverse bars *b c* are placed a number of bars, *f*. These bars *f* lie between the projections *g* on the bars *b*, and are provided with flanges or ledges *h* on their lower sides, upon which the cutting-punches *i* rest. The said cutting-punches are made of steel or other suitable material, and are hollow or tubular and sharpened upon their upper edges, as shown in Figs. 1 and 2. These cutting-punches are made of any suitable length and shape, according to the quality and duration of the sounds which it is desired that the instrument should produce.

The cutting-punches are placed between the bars *f*, (their bottom sides resting upon the ledges *h*,) according to the positions of the perforations which it is desired to make in the paper or other material. Blocks or packing-pieces *j*, of less height than the cutting-punches, are then placed between the bars *f*, to prevent the said cutting-punches from moving longitudinally, and screws *k*, passing through one or both of the side bars, *a*, are tightened, pressing the bars *f* and packing-pieces *j* together, to prevent lateral displacement of the cutting-punches. The projections *g* on the bars *b*, in addition to holding the bars *f* in position, also serve as fixed points, between which the packing-pieces *j* may be wedged.

The transverse bars *c* are preferably tapered upward and recessed between the bars *f*, as shown in Figs. 2 and 3, in order to prevent as far as possible the pieces of paper or other material punched out of the tune-bands or music-sheets and falling through the hollow cutting-punches from collecting on the said bars *c*, thereby obstructing the passages through the said cutters or punches. The paper or other material to be perforated is laid upon the said cutting-punches, and pressure is brought to bear upon the paper in order to force the cutting-punches through the same. This pressure is preferably produced by means of a roller, *m*, mounted in a carriage, *n*, and adapted to run over the cutting-punches *i*. To move the said roller, the carriage *n* carries a shaft, *o*, provided with a crank-handle, *p*, and two pinions, *q*, which latter are adapted to engage with the racks *e*. To prevent the carriage from rising, and the pinions from coming out of engagement with the racks, the carriage is provided upon each side with rollers *r*, which bear against the lower sides of the said racks.

To prevent the cutting-edges of the cutting-punches from being damaged by the roller *m*, the latter is arranged so that it will not quite come in contact with the said edges, and a piece of gutta-percha or other suitable material is placed between the paper and the roller, through which material the pressure is applied. If desired, the roller may be covered with india-rubber or like material.

After laying a piece of paper or the like upon the cutting-punches, with a sheet of gutta-

percha thereon, it will be seen that by turning the crank-handle *p* the carriage *n*, carrying the roller *m*, will be moved, thereby perforating the paper or other material in accordance with the shape and position of the cutting-punches.

It will be understood that the bed or frame A may be made of any desired length and width, the machine being suitable for perforating tune-bands or music-sheets of any size smaller than the area of the bed.

I do not confine myself to the apparatus hereinbefore described, as it is obvious that the cutting-punches may be employed in other forms of apparatus without departing from the nature of my invention; also, instead of forcing or pressing the paper upon the cutting-punches, I may force the latter upon the paper.

Although I have described the cutting-punches and the packing-pieces as being adjustable, it may be advantageous in some instances to dispense with the said packing-pieces and substitute therefor one or more boards or strips having suitable apertures, into which the cutters or punches may be inserted.

I am aware that it is not broadly new to combine a series of punches attached to a bed with means for forcing flexible material into contact with said punches to perforate said material. This, therefore, I do not claim; but

What I claim is—

1. The combination of the cutting-punches with movable interposed blocks for adjusting their position, bars *f*, provided with ledges *h*, which support the cutting-punches, and the longitudinal and transverse bars of the bed, substantially as set forth.

2. The combination of the bed and the cutting-punches of different sizes, adjustable lengthwise of the bed, with the interposed blocks, and means, substantially as described, for forcing a sheet upon the cutting-punches, said cutting-punches being adjustable into position to perforate the paper for different tunes, substantially as described.

3. The combination of the cutting-punches of different sizes and adjustable lengthwise of the bed with the movable interposed blocks for adjusting them to cut perforations for different tunes, and the roller for forcing a sheet against said cutting-punches, substantially as set forth.

In testimony whereof I have hereunto signed my name in the presence of two subscribing witnesses.

JOHN MAXFIELD.

Witnesses:

PERCY R. GOLDRING,

WALTER JAMES S. RERTEN,

Both of 17 *Gracechurch Street, London, E. C.*