

E. W. MYERS.

MACHINE FOR MAKING PERFORATED MUSIC.

APPLICATION FILED MAR. 10, 1909. RENEWED JULY 7, 1910.

984,289.

Patented Feb. 14, 1911.

4 SHEETS—SHEET 1.

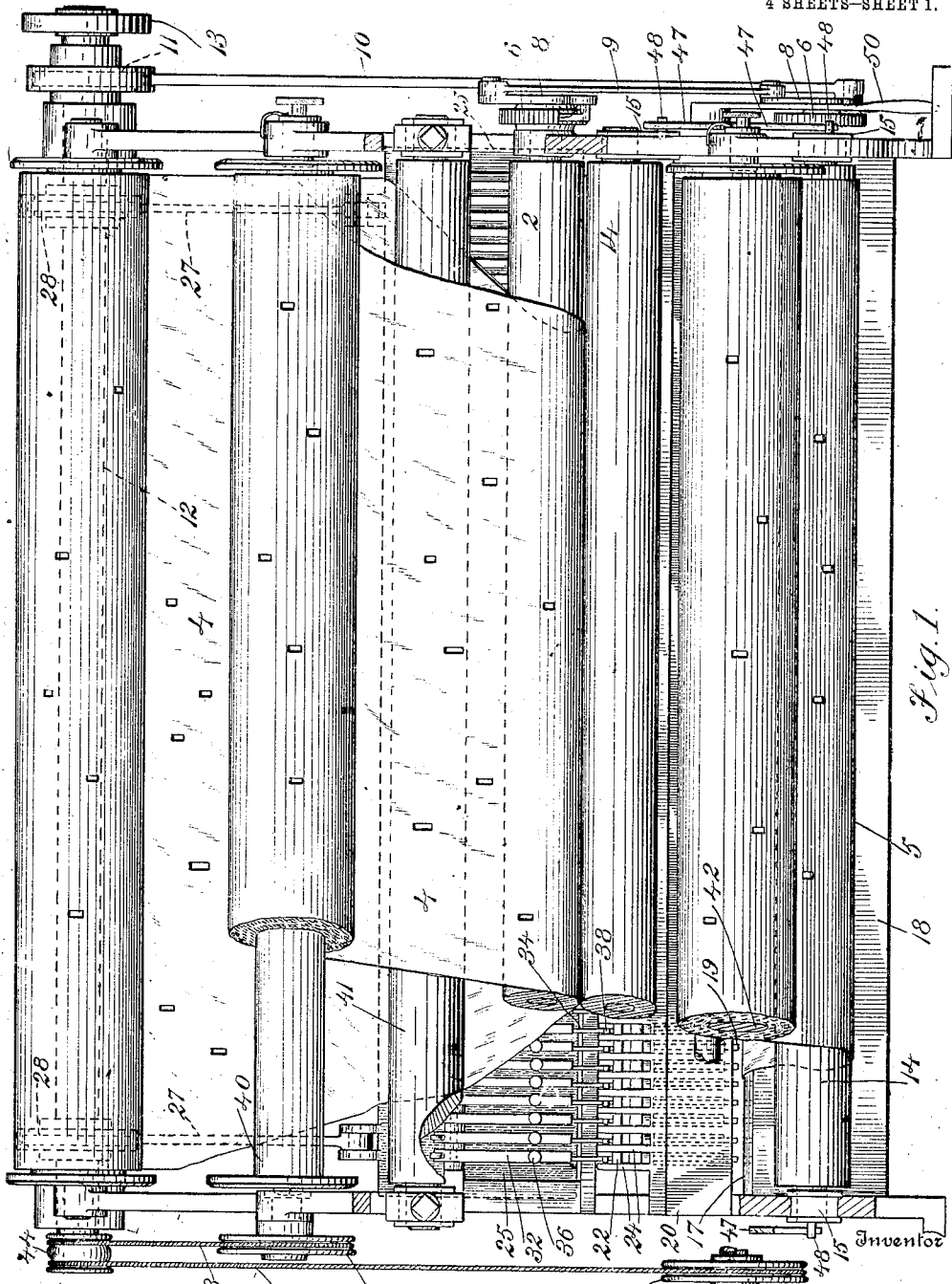


Fig. 1.

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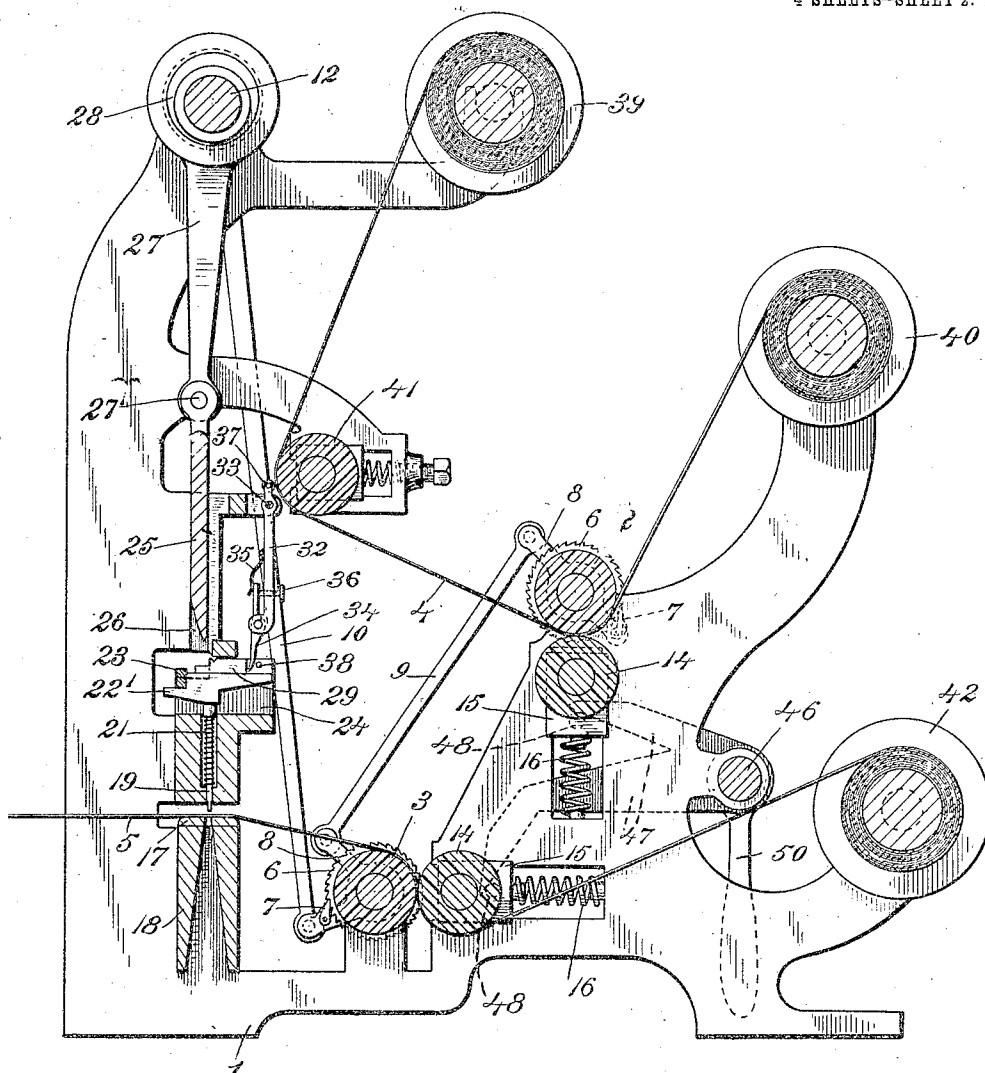


Fig. 2.

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4 SHEETS—SHEET 3.

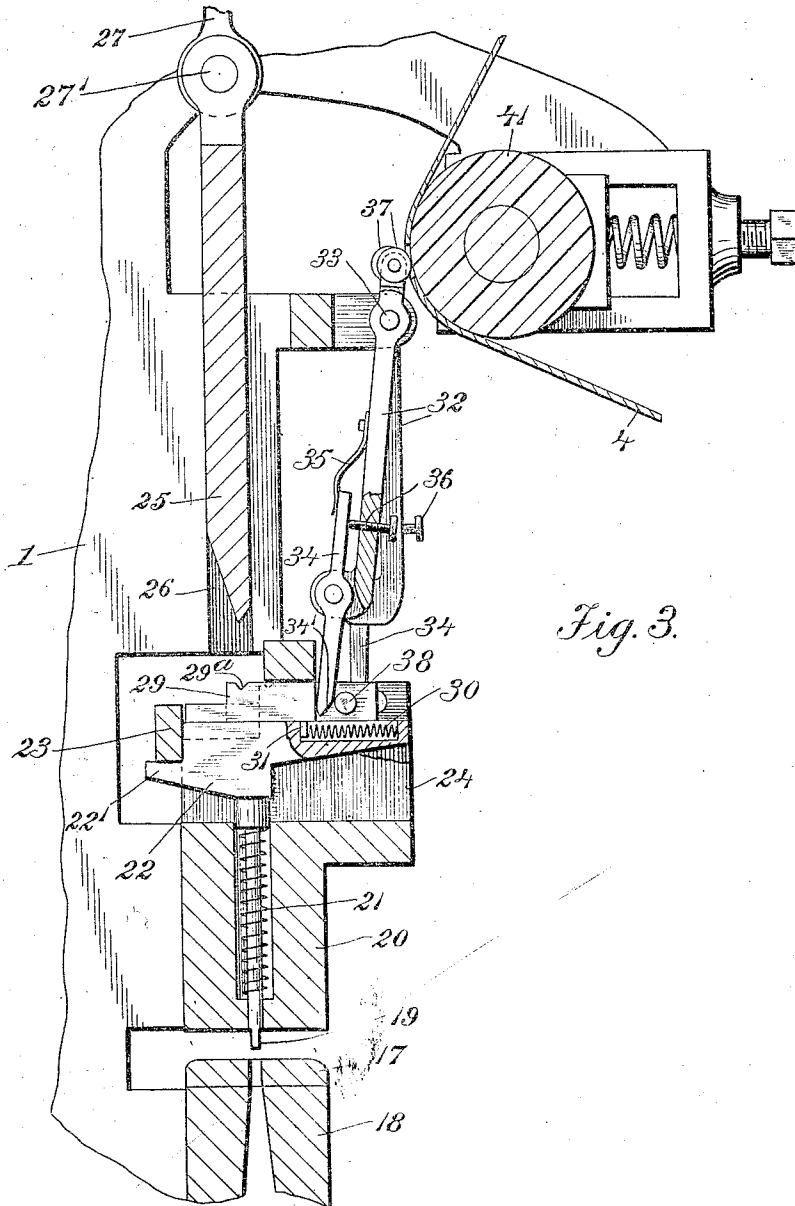


Fig. 3.

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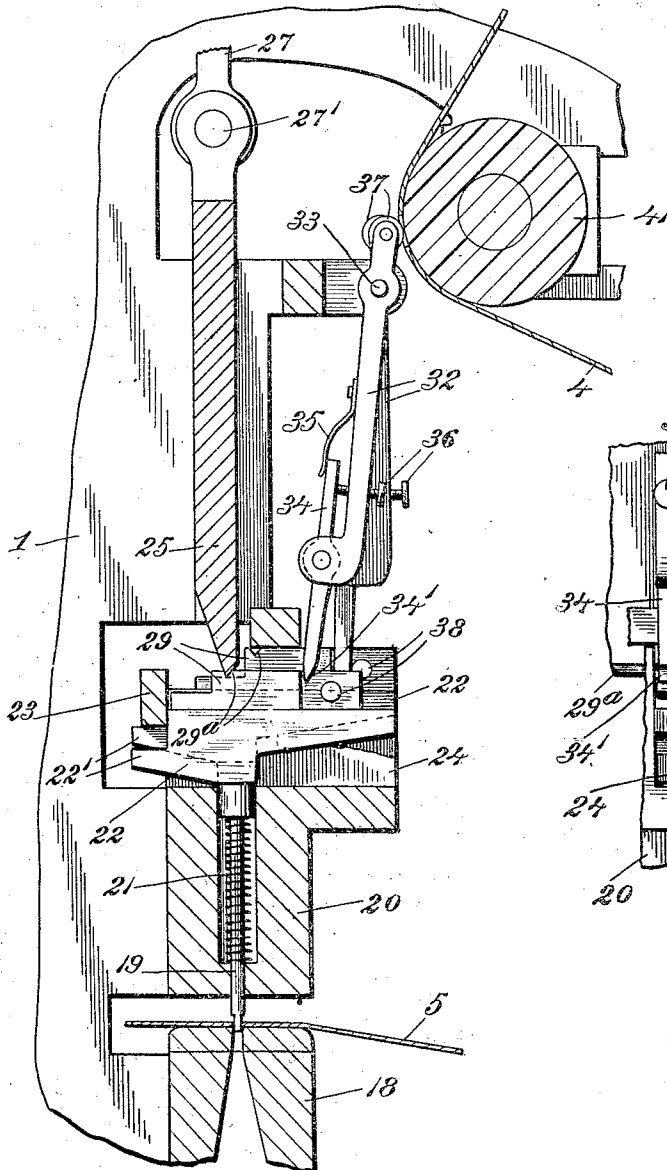


Fig. 4.

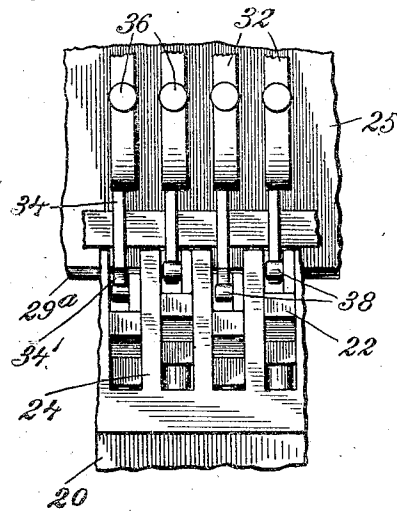


Fig. 5.

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UNITED STATES PATENT OFFICE.

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MACHINE FOR MAKING PERFORATED MUSIC.

984,289.

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To all whom it may concern:

Be it known that I, EDGAR WILLIAM MYERS, a citizen of the United States of America, and a resident of the city of Seattle, in the county of King and State of Washington, have invented certain new and useful Improvements in Machines for Making Perforated Music, of which the following is a specification.

My invention relates particularly to a machine of the above type, and has for its primary object to provide a construction wherein perforations in a master-sheet or pattern may be accurately reproduced in one or more sheets of paper at a time.

A further object resides in the provision of an improved punching mechanism, with novel means for controlling the punches thereof, relatively to the actuator.

A further object is to provide a construction wherein an ordinary piece or roll of perforated music, used in connection with automatic piano-players, can be employed as the pattern or master-sheet.

With the above and other objects in view, to be referred to as my description progresses, my invention resides in the structural features, arrangements and combinations of parts, hereinafter described and succinctly defined in my annexed claims.

Referring to the accompanying drawings, wherein my invention is illustrated in such form as now preferred by me: Figure 1 is a rear end elevation of my improved machine, parts being broken away for the purpose of showing the interior construction. Fig. 2 is a longitudinal sectional view thereof. Fig. 3 is a fragmentary sectional view, on enlarged scale, illustrating more particularly the construction of the die, one of the punches, and the controlling means therefor, the tracker member of the selector being illustrated as engaged in one of the perforations of the pattern or master-sheet, and having set the key having connection therewith, whereby the punch will be operated by the actuator or hammer. Fig. 4 is a similar view illustrating the punch as having been operated by the actuator or hammer, and Fig. 5 is a fragmentary detail view illustrating more particularly the arrangement of the adjustable keys for the punches

and the manner of slidably supporting the same.

Referring to the drawings by numerals of reference, 1 indicates a frame having journaled thereon shafts carrying feed rollers 2 and 3 for the pattern or master-sheet 4 and the copy sheet 5 respectively, as clearly shown in Fig. 2, which feed rollers are provided with pawl and ratchet mechanisms, to be described, connected for simultaneous operation, whereby said feed rollers can be operated together, in an intermittent manner to impart a step by step movement to said master and copy sheets. These ratchet devices comprise ratchet wheels 6, fixed to the shafts of feed rollers 2 and 3 (see Fig. 1), and spring pressed pawls 7 for engagement therewith, which pawls are pivotally supported on suitable carriers 8, swingingly mounted on the shafts of said feed rollers.

Carriers 8 are connected by a link 9, and the lower thereof, which is in the form of a bell crank lever, has one of its arms pivotally connected to a pitman 10, which latter is provided on its upper end portion with a strap engaged about an eccentric 11, provided on a drive shaft 12, having a pulley 13 to which power is applied, as by a belt, not shown.

Associated with feed rollers 2 and 3 are suitable presser rollers 14, journaled in slidably supported blocks 15 which are yieldingly pressed, as by springs 16 toward their respective feed rollers, as clearly shown in Fig. 2.

Reference numeral 17 indicates a die plate removably arranged on a base 18, extending transversely of frame 1, at the forward end thereof, see Figs. 1 and 2, and provided with a row of die openings corresponding in number and location to a series of vertically movable punches 19, slidably supported in a transverse member 20 of frame 1, spaced above die plate 17 so that the copy sheet 5 can be moved therebetween. Springs, as 21, normally hold the punches 19 in an elevated position. Punches 19 are provided on their upper end portions with elongated heads 22, having lips 22' on their forward end portions which engage under suitable stops 23 and thereby limit upward movement of the punches.

Heads 22 are held between vertical guides 24, in the form of ribs or walls formed on the upper face of frame member 20, directly beneath a single actuator or hammer 25, supported for vertical sliding in suitable guide grooves, as 26 of frame 1. This actuator or hammer 25 is operated by a pair of vertically reciprocating pitmen 27, pivoted thereto, as at 27', and being driven by a pair of eccentrics 28, on the drive shaft 12. Heads 22 are disposed below the path of movement of the actuator or hammer 25, and therefore in order to operate the same, an intermediate agent or means must be employed to communicate the movement of such actuator or hammer thereto. The means now employed by me consists of what I term "keys," designated at 29, the same consisting of blocks engaged for sliding on the heads 22 of punches 19 and forming supplemental head sections therefor.

Keys 29 are yieldingly pressed toward the path of movement of the actuator or hammer 25, by springs, as 30, the same being arranged in seats provided therefor, in heads 22 (see Fig. 3) and engaging depending lugs 31 of said keys, as will be readily understood.

In connection with keys 29, I provide selectors 32, there being one for each key, which selectors are pivoted as at 33, to suitable extensions of frame 1 and provided on their lower end portions with pivotally supported fingers 34, confined between a spring 35 and set screw 36 of the selectors, whereby a desired adjustment of said fingers on the selectors can be obtained. These fingers normally engage keys 29 and prevent sliding thereof and by reason of springs 30 tending to slide said keys, said selectors are held under tension, thereby insuring of their trackers 37, consisting of rollers journaled on their upper end portions, being firmly held against the master sheet.

Upon a tracker 37 of a selector entering an opening of the master-sheet, as indicated in Fig. 3, the key controlled thereby being relieved of its restraining influence, is moved by its spring 30 into the path of the actuator or hammer 25. In Fig. 4 I have illustrated said actuator or hammer in lowered position, and those of the keys 29, as have been set by their selectors in the manner just described, engaged thereby and having operated their punches 19 to perforate the copy sheet 5.

The means provided on keys 29 for engagement with fingers 34, as now considered, comprises horizontally disposed pins 38 arranged in suitable cut-outs, as shown, provided in the rear end portions of said keys. Fingers 34 have their lower end portions formed with cam surfaces 34', provided for engagement with the pins 38, to insure of proper engagement of the selectors with

their keys upon each return movement of the punches. To prevent keys 29, slipping when engaged by the actuator or hammer 25, I form the same with inwardly tapering seats, as 29^a adapted to receive the active end portion of said actuator or hammer, which is preferably reduced to correspond thereto in cross sectional form.

Reference numerals 39 and 40 indicate spools provided for the pattern or master-sheet 4, which unwinds from the former and after passing over a bearing roller 41 and feed roller 2 is taken up on the latter. Selectors 32 are arranged in front of bearing roller 41, so that the latter provides a firm support for the pattern or master-sheet at the point where it is engaged by the engaging or tracker members of the said selectors, as clearly shown in Figs. 2 to 4 inclusive.

Copy sheet 5 being fed across die plate 17, is passed between feed roller 3 and its presser roller 14 and made fast to a suitable take up spool 42.

Take up spools 40 and 42 are driven by belts, as 43, 43', respectively, passing over suitable sheaves 44, and 45, the former of which is fixed to drive shaft 12 and the latter to the shafts of said take-up spools. These belts are preferably formed of coil springs, such elastic construction permitting of their slipping on the sheaves 44, 45 after spools 40 and 42 have been rotated to take up such of the master and copy sheets as have been advanced by the feed rollers.

In operation, drive shaft 12 is driven continuously thereby causing actuator or hammer 25, which is common to all of the keys 29, to have constant movement. During this continuous movement of shaft 12, pitman 10 swings carriers 8 to operate feed rollers 2 and 3, as described, thereby imparting a step by step movement to the master and copy sheets 4 and 5 respectively. This step by step movement of the master sheet is so timed relatively to the actuator or hammer 25, that an interval of time, sufficient to insure of the shifting of the keys 29 by such of the selectors as have their engaging or tracker members engaged in openings of the master sheet when the latter stops, elapses prior to the active stroke of said actuator or hammer. The next unit of feed of pattern or master-sheet 4 occurs after springs 21 have elevated those punches operated to perforate copy sheet 5, those of the engaging or tracker members 37 as are engaged in openings of the pattern or master-sheet, riding or being forced therefrom during such movement of the pattern or master-sheet and thereby returning their keys to their inactive position.

To facilitate the operation of threading the sheets between feed rollers 2 and 3 and their companion presser rollers 14, I have provided novel means for simultaneously.

shifting said presser rollers therefrom, said means comprising a shaft 46, journaled on frame 1 and provided on each end portion with a pair of fixed arms, as 47, arranged to engage pins or engaging parts 48 on the slidably supported bearing blocks 15. A suitable handle 50 is provided on shaft 46 for rotating the same and thereby causing arms 47 to slide bearing blocks 15 in which the presser rollers are journaled. Springs 16, as will be readily understood, return bearing blocks 15 to their normal positions.

By my construction an actuator or hammer of simple construction and through the medium of which a simultaneous and uniform operation of all the keys arranged in its field of operation, is assured. Further, in arranging the keys as described, a compact and efficient construction results.

Through the medium of my machine, perforated music sheets for mechanical piano players can be accurately reproduced with rapidity and at a comparatively low cost of manufacture.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent of the United States of America, is:

1. A machine for making perforated music comprising a plurality of punches supported for movement, a hammer means supported for movement toward and from said punches, means for operating said hammer means, keys slidably supported on said punches for movement into and out of the path of said hammer, and means for controlling the movement of said keys including a master-sheet and a plurality of selectors supported on a relatively fixed part for movement and arranged to engage said master sheet and being releasably connected to said keys to be disengaged therefrom by movement thereof by said hammer means.

2. A machine for making perforated music comprising a hammer means, a plurality of punches arranged out of the path of said hammer means, means supporting said punches for movement, a plurality of keys supported for movement into and out of the path of said hammer means for communicating the movement of the latter to said punches, means on said punches yieldingly pressing said keys into the path of said hammer means, and means for controlling the movement of said keys including a master-sheet and a plurality of selectors, engaging said master-sheet and having connection with said keys.

3. A machine for making perforated music comprising a hammer means, a plurality of punches arranged out of the path of said hammer means, means supporting said punches for movement, a plurality of keys supported on said punches for movement into and out of the path of said ham-

mer means for communicating the movement of the latter to said punches, means yieldingly pressing said keys into the path of said hammer means, and means for controlling the movement of said keys including a master-sheet and a plurality of selectors engaging said master-sheet and having releasable connection with said keys, where by disengagement thereof will be effected by movement of said keys by said hammer means, said selectors being pivotally supported on a relatively fixed part as specified.

4. A machine for making perforated music comprising a plurality of punches supported for movement, spring means for holding and returning the same to normal position, said punches being provided with elongated heads having lips, stops for engagement with said lips of the punches for limiting upward movement of the latter, keys slidably supported on the heads of said punches, a hammer means, means supporting said hammer means for movement toward and from said punches into engagement with said keys, and means for controlling the movement of said keys including a master-sheet and a plurality of selectors connected to said keys and engaging on said master-sheet.

5. A machine for making perforated music comprising a plurality of punches supported for movement, keys slidably supported on said punches, said keys being formed in their outer faces with seats, means for controlling the movement of said keys including a master-sheet and a plurality of selectors arranged to engage said master-sheet and having connection with said keys, and a hammer common to all of said keys supported for movement across the path thereof, said hammer having its active end reduced in thickness to engage in the seats of said keys.

6. A machine for making perforated music comprising a plurality of punches supported for movement, an actuator means therefor supported for movement, keys supported for movement between said actuator means and said punches for communicating the movement of the former to the latter, and means for controlling the movement of said keys including a master-sheet and selectors engaged with said master-sheet and provided with adjustable fingers releasably connected directly with said keys.

7. A machine for making perforated music comprising a plurality of punches supported for movement, an actuator means therefor supported for movement, keys supported for movement between said actuator means and said punches for communicating the movement of the former to the latter, pins on the rear end portions of said keys, and means for controlling the movement of

said keys including a master-sheet and pivoted selectors engaged at one end with said master-sheet and provided on their other ends with fingers having cam surfaces for engagement with the pins of said keys.

8. A machine for making perforated music comprising a plurality of punches supported for movement, and actuator means therefor supported for movement, keys slidably supported on said punches for movement into and out of the path of said actuator means, means for controlling the movement of said keys including a master-sheet and vertically arranged pivoted selectors provided at one end with engaging members bearing on said master-sheet and having their other end portions releasably engaged directly with said keys, and means yieldingly pressing said keys toward the path of said actuator.

9. A machine for making perforated music comprising a continuously driven shaft, a plurality of punches, means for moving the copy sheet beneath said punches including a feed roller, a master-sheet, a feed roller therefor, ratchet devices for said feed rollers connected for simultaneous operation, a pitman connected to drive said ratchet devices from said shaft, a reciprocating hammer connected with said shaft for operation thereby, keys supported for movement between said hammer and said punches, and pivotally supported selectors releasably connected with said keys and provided with rollers bearing on said master-sheet.

10. In a machine for making perforated music in combination with the drive shaft, the punching mechanism, a copy sheet, and the master-sheet, spools driven from said drive shaft for taking up said copy, and master-sheets as advanced; means for advancing said copy and master-sheets simultaneously in a step by step manner, said means including feed rollers and slidably supported rollers for pressing the sheets

against the same, and means for simultaneously moving said presser rollers from said feed rollers.

11. A machine for making perforated music comprising a plurality of punches supported for movement, a hammer means supported for movement toward and from said punches, means for operating said hammer means, keys slidably supported on said punches for movement into and out of the path of said hammer means, and means controlling the movement of said keys including a master sheet and a plurality of selectors engaging said master sheet and having releasable connection with said keys, said selectors being supported on a relatively fixed frame part against movement with said keys when the latter are actuated by said hammer means.

12. A machine for making perforated music comprising a plurality of punches supported for movement, a hammer means supported for movement toward and from said punches, means for operating said hammer means, keys slidably supported on said punches for movement into and out of the path of said hammer means, means yieldingly pressing said keys toward said path, and means controlling the movement of said keys including a master sheet, a plurality of selectors pivoted to a relatively fixed frame part and engaging said master sheet, and a plurality of fingers connected to said selectors for movement therewith, said fingers having a direct and releasable connection with said keys for sliding the same into the path of said hammer means, and being disengaged therefrom by movement of said keys by said hammer means.

Signed at Seattle, Washington this 24th day of February 1909.

EDGAR WILLIAM MYERS.

Witnesses:

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