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MACHINE FOR MAKING MUSIC ROLLS.

APPLICATION FILED DEC. 3, 1914.

1,259,040. Patented Mar. 12, 1918.

Fig. 1.

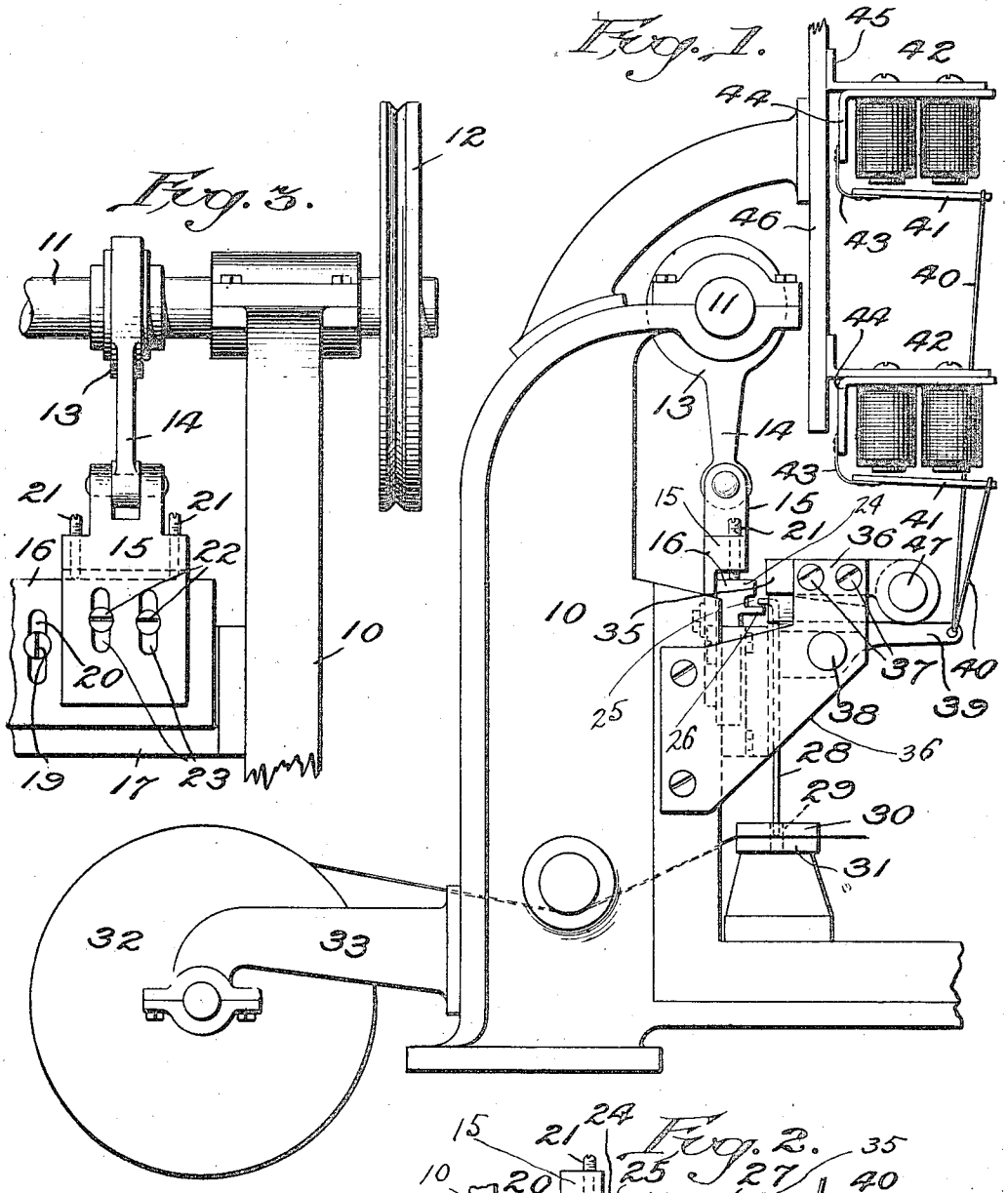


Fig. 3.

Fig. 2.

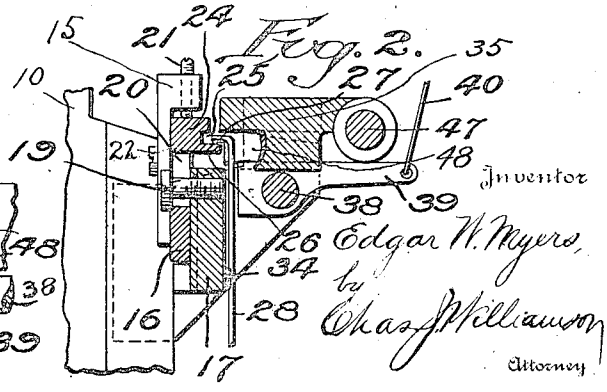
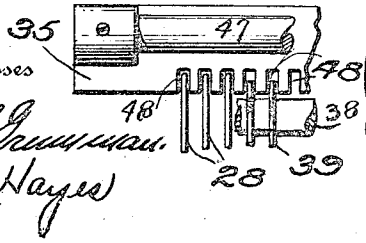


Fig. 4.



Witnesses

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MACHINE FOR MAKING MUSIC-ROLLS.

1,259,040. Specification of Letters Patent. Patented Mar. 12, 1918.

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To all whom it may concern:

Be it known that I, EDGAR W. MYERS, a citizen of the United States, and resident of San Jose, in the county of Santa Clara, and in the State of California, have invented a certain new and useful Improvement in Machines for Making Music-Rolls, and do hereby declare that the following is a full, clear, and exact description thereof.

My invention relates to machines for perforating sheet material, and in particular to machines for making master sheets for the reproduction of perforated sheet music for piano playing and like machines, and generally stated my object is to provide a machine for this purpose of high efficiency and accuracy in the production of the perforations corresponding to the notes to be rendered, and which, while capable of accurate or close adjustment, will be simple, not apt to get out of order and lasting, and for the attainment of my object and others, which will be evident to those skilled in the art when the structure embodying my invention is understood, my said invention consists in the mechanism constructed substantially as hereinafter specified and claimed.

In the accompanying drawings—

Figure 1 is a side elevation of a machine embodying my invention;

Fig. 2 is a vertical section of a portion thereof on a larger scale;

Fig. 3 is an end elevation of such portion of the machine as is shown in Fig. 2;

Fig. 4 is a detail view showing the slotted punch and lever guiding bar.

As an introductory, or brief preliminary description of the machine shown in the drawings for illustrating an embodiment of my invention, such machine comprehends a gang or row of side by side punches, a constantly reciprocating chuck, and means for selectively placing the punches in operative connection with the reciprocating chuck according to the notes to be mechanically reproduced on the player instrument, such notes and the time value thereof being those rendered initially on the piano, or other instrument, the blank paper to form the master sheet being, of course, fed past the row or gang of punches. The speed of reciprocation of the punches, as is common in this art, is such that an opening, or slot of a length corresponding to the time value of the note, will result from the rapid reciprocation of the punches, a succession of reciprocations resulting in a continuous slot.

Taking up now the detailed description of the machine shown in the drawings, it will be found to comprise a frame conveniently made of cast iron having two end plates 10 substantially L-shape. Journaled in bearings in said end plates is a main driving shaft 11 having on one end, beyond one of the end plates, a pulley 12 which is a convenient means of applying power to said shaft to revolve it. Adjacent to the inner side of each end plate 10, the driving shaft has an eccentric 13 upon which is placed a pitman, or link 14 that hangs vertically below the shaft. To the lower end of each pitman 14 is pivotally connected a block 15 to which is secured a transversely extending horizontal bar 16 which I term a chuck, and to which is temporarily operatively connected the selected punches, all as is more fully hereinafter described, said chuck, as will be evident, being reciprocated vertically by the action of the eccentrics. The chuck is guided in its reciprocations by a transversely extending horizontal guide bar 17 which is secured at its ends to the end plates 10 and to which the chuck is slidably secured by several horizontal headed screws 19 that pass respectively through slots 20 in the chuck, the screw heads overlapping the sides of the slots. The chuck bar 16 is adjustably connected with its two supporting and reciprocating blocks 15 so that nice, or close vertical adjustment of the chuck may be effected, such adjustment being provided for by a pair of vertical adjusting set screws 21 which pass downward through a horizontal flange at the top of each block and impinge upon the top of the chuck, and the connection between each of said blocks 15 and the chuck bar consisting of one or more screws 22, and a slot 23 for each screw in the block through which the screw shank passes into a threaded opening in the chuck bar.

The chuck bar 16 has above the guide bar 17 a horizontally projecting flange 24 in the outer face of which is a horizontal slot, or notch 25 to form upper and lower shoulders, the lower shoulder 26 being projected to a vertical plane beyond that of the upper shoulder and into said notch or slot is adapted to be sprung the horizontally turned upper end, or finger 27 of each of the gang, or row of vertical punches 28. At its lower end

each of said punches is fitted within a guide hole 29 in a horizontal guide bar 30 supported above a die block 31 containing the die holes through which the selected punches move penetrating and punching out the paper of the sheet passing between the guide block 30 and the die block 31, these two being spaced apart, of course, to permit the passage of the paper, which is taken from a supply roll 32 supported by brackets 33 fastened to the end plates of the frame. Intermediate the top and bottom ends of the punches they pass over and rest against a rib, or projection 34 on the side of the chuck guiding bar 17 next to the row of punches, said rib, or projection forming a fulcrum, or bearing for the punches so that when pressure is applied to them near their upper ends they will move inward to cause the fingers at their upper ends to enter the slot 23 in the chuck and thereby cause the punches, so manipulated, to become operatively connected with the chuck and to partake of the rapid reciprocation thereof. The upper shoulder of the slot, of course, moves the punches downward while the lower shoulder 31 passing beneath the fingers lifts them. To limit the upward movement of the punches their upper ends are overhung by a block, or bar 35, preferably, but not necessarily, of bronze, which is supported by a bracket 36 secured by screws to the outer side of each end plate 10, screws 37 being employed to attach said stop bar at its ends to said brackets 36.

Extending horizontally between and supported at its ends by the brackets 36, is a round rod 38 upon which a row of levers 39 are pivoted side by side, there being a lever for each punch, and each lever having a wide bearing end contiguous to a punch near the upper end thereof so that upon the rocking of the lever upon the pivot rod 38 it will impinge upon the contiguous punch and press, or spring it inward upon the rib 34 as a fulcrum to spring, or place the finger 27 at its upper end in a position to engage the shoulders of the chuck flange 24. Each lever 39 is connected by a light rod, or wire 40 to an armature 41 of an electro-magnet 42 which is in a circuit that is controlled by one of the keys of the piano, or operating instrument, so that upon the striking of that key to play a note and so long as the key is depressed and the circuit through the magnet closed, the lever 39 will be rocked to a position to produce a clutching engagement until the circuit is broken by the release of the piano key. The armature 41 is preferably supported for its swinging movement by a spring 43 attached to an arm 44 forming a part of the magnet frame, said arm 44 being attached to a bracket 45 which is secured to a plate 46 of fiber fastened to the supporting frame of the machine.

To limit the movement of the punch-operating levers by the action of the magnets, the bar, or block 37 is provided at its ends with lugs or ears that support a rod 47 in position above the levers 39 to limit, or stop their movement at the point when the punches have been swung into engagement with the chuck. The upper finger portion of each punch 28 is situated in a slot 48 in the bar 35 and thereby the punch is restrained from turning into the lower part of each slot 48 and enters the upper portion of a lever 39, the latter being thereby held in position laterally.

From the description of the construction and the operation that I have thus far given, the manner of use of the structure shown in the drawings as embodying my invention, will be readily understood so that nothing by way of description need be added to what has been said.

It will be seen that in the operation of the mechanism, even if a punch is released by its lever 39 and the punch swings out of the notch in the chuck bar before the upper limit of movement of the punch is reached, that the lower shoulder 31 on the chuck, which at all times is below the punch finger, will engage the finger and lift the punch to its uppermost position. The punches, of course, are made of material having enough spring, or elasticity to cause them to spring out of the slot in the chuck bar far enough to clear the upper finger-engaging shoulder.

It will be understood that my invention may be embodied in mechanism differing in its parts from the structure shown in the drawings and the scope of the appended claims is to be determined in the light of this statement.

Having thus described my invention what I claim is—

1. In a machine for perforating sheet material, the combination of a plurality of independent punches each consisting of a single slender member of flexible material so as to be capable of being bent or flexed laterally, an actuator for the punches, means for constantly reciprocating the actuator, and selective devices for flexing the punches to place them in operative connection with the actuator.

2. In a machine for perforating sheet material, the combination of a plurality of independent punches each consisting of a single slender member of flexible material so as to be capable of being bent, or flexed laterally, an actuator for the punches, means for constantly reciprocating the actuator, a lever for each punch, and means for actuating each lever separately to cause it to flex its punch.

3. In a machine for perforating sheet material, the combination of a reciprocating chuck bar having oppositely situated shoul-

ders, a row of punches having each a projection, or finger movable into and out of the space between said shoulders, and means for placing said fingers between said shoulders whereby the punches are operatively connected with and partake of the movement of the chuck.

4. In a machine for perforating sheet material, the combination of a reciprocating chuck bar having oppositely situated shoulders, a row of punches having each a projection, or finger movable into and out of the space between said shoulders, means for placing said fingers between said shoulders whereby the punches are operatively connected with and partake of the movement of the chuck, and a stop that overhangs the punches in their path of movement with the chuck.

5. In a machine for perforating sheet material, the combination of a suitable frame, a reciprocating chuck, a guide bar for the chuck, a row of punches at one side of said guide bar, a projection on the guide bar frame, forming a fulcrum for the punches intermediate the ends thereof, said punches being flexible, and punch bending devices situated to engage the punches to one side of said fulcrum and to move the same in operative connection with the chuck whereby the punches partake of the movement of the chuck.

6. In a machine for perforating sheet material, the combination of an actuator having spaced shoulders, means for imparting movement to the latter, a plurality of punches normally disconnected from the actuator reciprocable in the direction of movement of the actuator and having each a part adapted to be moved into and between said spaced shoulders, and selective means for temporarily operatively connecting the punches and the actuator by the movement of the punches between said spaced shoulders.

7. In a machine for perforating material, the combination of an actuator having spaced shoulders, means for imparting movement to the actuator, a plurality of punches reciprocably supported and normally disconnected from the actuator, said punches and actuator having projections adapted to be moved between said spaced shoulders, a bar having guides for the portions of the punches that have said projections, and selective means for moving the punches to place their projections between the shoulders of the actuator.

In testimony that I claim the foregoing I have hereunto set my hand.

EDGAR W. MYERS.

Witnesses:
R. R. BELL,
D. P. SIMONS.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."