G. FUSSELL.

PRINTING DEVICE.

APPLICATION FILED SEPT. 15, 1919.

1,335,491.

Patented Mar. 30, 1920.

2 SHEETS—SHEET 1.

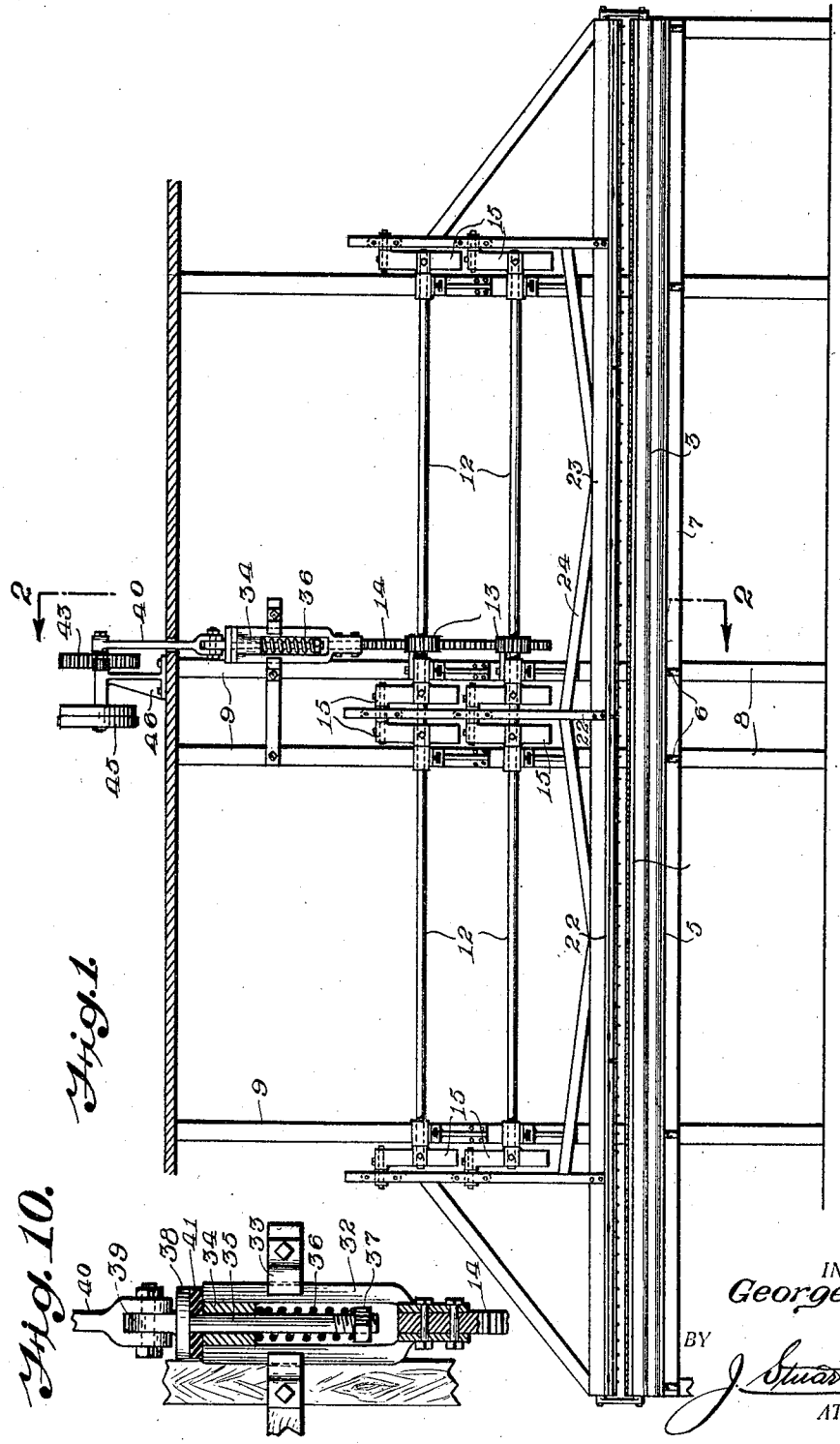


Fig. 1.

Fig. 10.

INVENTOR.
George Fussell,
BY
J. Stuart Freeman,
ATTORNEY.

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2 SHEETS—SHEET 2.

Fig. 2.

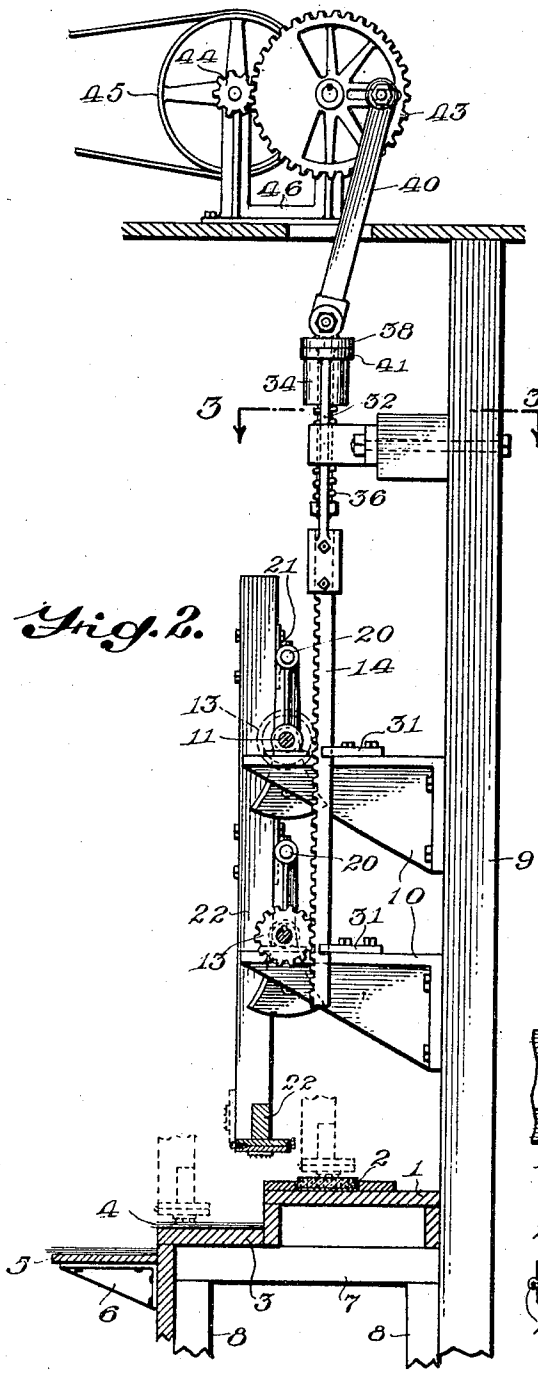


Fig. 4.

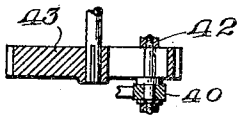


Fig. 3.

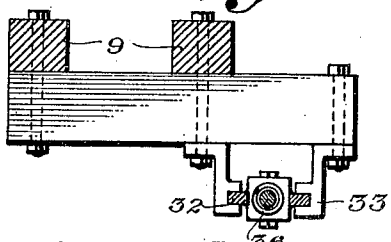


Fig. 5.

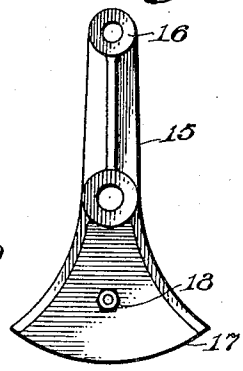


Fig. 6.

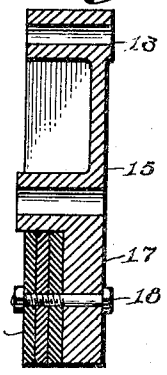


Fig. 7.

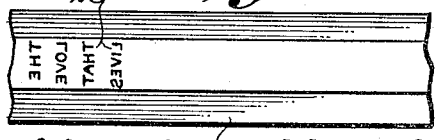


Fig. 9.

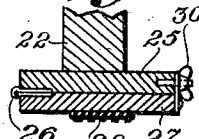
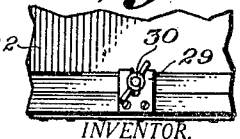


Fig. 8.



27

INVENTOR.

George Fussell,

BY

J. Stuart Freeman,

ATTORNEY.

UNITED STATES PATENT OFFICE.

GEORGE FUSSELL, OF PHILADELPHIA, PENNSYLVANIA.

PRINTING DEVICE.

1,335,491. Specification of Letters Patent. Patented Mar. 30, 1920.

Application filed September 15, 1919. Serial No. 323,684.

To all whom it may concern:

Be it known that I, GEORGE FUSSELL, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Printing Devices, of which the following is a specification.

The object of this invention is to provide an improved printing device, particularly adapted to the extremely unusual conditions and demands incident to printing the words of a song upon the ordinary perforated web of a so-called player-piano music-roll.

In this industry, the printing of the words of any given composition cannot be in the usual form of words following each other consecutively upon separate lines and several upon each line, but must appear as single words, and often as individual syllables thereof, each upon its own line and reading as it were from the bottom toward the top of the music-roll, when said roll is faced by the player of a reproducing piano or other musical instrument, and the roll is in the normal operative position passing over the surface of the usual tracker-board.

Many forms of printing devices have been tried to accomplish the desired results in this line, but it must be remembered that the average music rolls run from approximately 25 feet up to 32 feet in length, and that to have a revolving drum to carry type from a single roll would necessitate such a drum having a diameter of at least 10 feet, which would be ungainly and cumbersome.

It has also been tried to arrange the words spirally upon a smaller drum, but it has been found with this arrangement that it is almost impossible to have the words and their syllables register exactly with the characteristic perforations of a music-roll while determining the note or chord which must be struck simultaneously with the pronunciation of a certain characteristic syllable in a given musical composition.

In addition to the above, other methods of printing these music-rolls have been devised, with the result that today the only feasible method is that made possible by the use of sectional stencils, but which are inefficient, have no positive means of insuring their register with the perforations of the roll, and do not insure a uniform intensity and evenness of the application of the printing ink.

Wherefore, in view of the foregoing and other facts well known to those fully acquainted with the industry, the object of this invention is to provide a support for music-rolls, each of maximum length and extending in flat open position, an inking surface positioned in spaced relation from the impression base carrying the said perforated music-rolls, an oscillatable support for any suitable form of type, preferably parallel arms or links operative to move the type-support from the inking surface to the impression base alternately, a gear connected to operate each of said arms, a rack connecting and operative to revolve said gears in opposite directions to a suitable source of power to operate said rack, and means between said power source and said rack to permit said rack to yield as it approaches one limit of movement, in order to stack against a considerable thickness of blank rolls which at the beginning of the operation may be placed upon the impression base to be printed.

With these and other objects in view, the invention comprises novel details of construction and operation fully brought out in the following description, when read in conjunction with the accompanying drawings, in which Figure 1 is a front elevation of the preferred embodiment of the invention; Fig. 2 is a vertical section taken on the line 2—2 of Fig. 1; Fig. 3 is a section taken on the line 3—3 of Fig. 2; Fig. 4 is a diametrical sectional view of the driving-gear shown at the top of Fig. 2; Fig. 5 is a side elevation of one of the operating links for the type support; Fig. 6 is a longitudinal transverse section of the same; Fig. 7 is a bottom plan view of one form of type support, showing several words positioned therein in the form of type; Fig. 8 is a fragmentary view showing one method of securing said type support in operative position; Fig. 9 is a transverse vertical sectional view of the same; and Fig. 10 is an enlarged detail transverse sectional view showing the yielding means between the source of power and the operating rack.

Referring to the drawings, a table is pro-

vided having a plurality of sections of different elevations, and comprising a platform 1, upon which is secured a suitable inking surface 2, a platform 3 slightly lower than said first named platform, and upon which any convenient number of blank perforated music-rolls 4 may be laid in flat extended position, and a third platform or shelf 5 supported by brackets 6, and upon which said rolls are placed as soon as they are printed, said platforms being supported by means of transverse spaced members 7 supported by suitable uprights 8, which may, if desired, rest directly upon the floor or other foundations.

Extending upwardly from the rear of, and preferably secured to, the structure above described are spaced beams 9, each provided with a pair of spaced brackets 10 one superimposed above the other, and each provided with adjustably positioned journal boxes 11, in which are revolubly mounted spaced shafts 12, two of which are provided with gears 13 rigidly keyed to each of the shafts upon which they are mounted and connected by means of a rack 14.

Secured to each of the end portions of said shafts is a link 15, having an oscillatable centrally apertured portion 16 and an enlarged section 17 extending in the opposite direction, and provided with means 18 for securing thereto any desired number of counter-balancing weights 19. Secured to the end portion 16 of each of said links is a pin 20, which is also revolubly mounted in a journal bearing 21 secured to spaced bars 22, which are connected at their lower ends by means of longitudinally extending rods 23 and guy-braces 24, while said rods in turn are provided upon their under surfaces with a head 25, having pivotally secured thereto along one edge portion by means of links 26 any suitable holder 27 for type 28, such for instance as block sections of rubber type.

The type holding means 27 may be oscillated with respect to the head 25, so that the former swings into such position as to make it easy to attach thereto or detach therefrom the type to be used in the printing process, said type supporting means, however, being normally secured rigidly with respect to said head by any suitable means, such for instance as a plate 29 and thumbscrew 30 clearly shown in Figs. 8 and 9.

The said rack 14 is operative to reciprocate vertically in a path fixed by means of guides 31 carried by each of the brackets 10, while to the uppermost end portion of said rack there is secured a block comprising spaced parallel members 32 adapted to reciprocate in guides 33 supported by the beams 9, and connected at their uppermost portions by a centrally apertured head 34, through which slidably extends a pin 35, surrounding the lower portion of which, between the members 32, is a coil-spring 36, the tension of which is adjustable by means of a bolt 37 carried by the threaded end of said pin. Adjacent to the upper end of said pin, the same is provided with a radially extending flange 38, beyond which said pin terminates in a centrally apertured bore 39, which is pivotally connected by a pitman 40, while the flange 38 of said pin is normally spaced from the head 34 by means of a centrally apertured block 41 of yielding material.

The pitman 40 is connected by means of a radially adjustable bolt 42 to a driving-gear 43, which in turn is revolved continuously by means of a pinion 44 connected to revolve in unison with any suitable form of power transmission members, such as the belt-wheel 45 driven from any suitable source of power, said gears 43 and 44 being supported by means of any suitable frame 46 maintained in constant uniform relation with respect to the other parts of the apparatus entering into this invention.

With the construction described, it will be obvious that as the driving-gear 43 revolves continuously, as for instance in a clockwise direction, the rack 14 is forced downwardly, thus operating the bars 22 to oscillate the type carried indirectly thereby into contact with the inking surface 2, which, to all intents and purposes, remains constantly in a given position and at a substantially fixed level. On the other hand, as the pitman 40 passes the dead center and rises, it operates the said rack to oscillate the bars 22 toward and firmly into coöperation with the uppermost of a pile of music-roll sheets 4 upon the impression base 3.

Now if the adjustable bolt 37 is so positioned that the mechanism illustrated in detail in Fig. 10 remains as shown, when the type contacts with the last single sheet of a pile upon said impression base, then it is obvious that without the interposition of the coil-spring 36, the gear 43 could not carry the pitman 40 over its uppermost dead center when the type contacts with the uppermost sheet of a pile upon said impression base. As it is, the type contacts with the top sheet of a pile with but slightly greater pressure than it does finally with the last sheet of said pile, but the pitman 40 and pin 35 continue to move upwardly until the former safely passes the uppermost dead center and starts its downward movement to oscillate the type-carrying means again toward the ink supplying surface.

As each top sheet upon the impression base receives an impression of the type, which same comprises the words and syllables corresponding with the peculiar arrangement of the perforations preferably already applied to the music-roll sheets,

the same is removed by hand or otherwise to the shelf 5, thus exposing to the printing operation the next lower sheet of the pile.

Having thus described my invention, what I claim and desire to protect by Letters Patent of the United States is:—

1. A printing machine, comprising an impression base and an ink surface lying in parallel planes, a typeholder, a pair of links pivotally supported and pivotally connected to said typeholder, a gear connected to and movable with each link, and a rack connecting said gears, to operate said links in unison, to oscillate said typeholder between said base and said surface intermittently.

2. A printing machine, comprising an impression base and an ink surface lying in parallel planes, a typeholder, a pair of links pivotally supported and pivotally connected to said typeholder, a gear connected to and movable with each link, a rack connecting said gears, and a source of power connected to operate said rack, to operate said links equally and in unison, to oscillate said typeholder between said base and said surface intermittently.

3. A printing machine, comprising an impression base and an ink surface lying in parallel planes, a typeholder, a pair of links pivotally supported and pivotally connected to said typeholder, a gear connected to and movable with each link, a rack connecting said gears, means to connect said rack to a source of power, and means to permit said rack to yield with respect to said connecting means when near one limit of its movement.

4. A printing machine, comprising an impression base and an ink surface lying in parallel planes, a typeholder, a pair of links pivotally supported and pivotally connected to said typeholder, a gear connected to and movable with each link, a rack connecting said gears, means to connect said rack to a source of power, and means to permit said rack to yield with respect to said connecting means, when type carried by said typeholder is in contact with an article upon base.

5. A printing machine, comprising an impression base and an ink surface, a type-support, a pair of links pivotally supported and pivotally connected to said type-support, a gear connected to and movable with each link, and a rack connecting said gears, to operate said links in unison, to oscillate said type-support between said base and said surface intermittently.

6. A printing machine, comprising an impression base and an ink surface, a type-support, a pair of links pivotally supported and pivotally connected to said type-support, a gear connected to and movable with each link, a rack connecting said gears, and a source of power connected to operate said rack, to operate said links equally and in unison, to oscillate said type-support between said base and said surface intermittently.

7. A printing machine, comprising an impression base and an ink surface, a type-support, a pair of links pivotally connected to and pivotally supported by said type-support, a gear connected to and movable with each link, a rack connecting said gears, means to connect said rack to a source of power, and means to permit said rack to yield with respect to said connecting means when near one limit of its movement.

8. A printing machine, comprising an impression base and an ink surface, a type-support, a pair of links pivotally connected to and supported by said type-support, a gear connected to and movable with each link, a rack connecting said gears, means to connect said rack to a source of power, and means to permit said rack to yield with respect to said connecting means, when type carried by said type-support is in contact with an article upon said base.

9. A printing machine, comprising an impression base and an ink surface, a type-support, a link pivotally supported and pivotally connected to said type-support, to operate said support between said base and said surface intermittently, and means to counter-balance the weight of said type-support upon the pivotal support of said link.

10. A printing machine, comprising an impression base and an ink surface, a type-support, a plurality of links pivotally supported and pivotally connected to said type-support, to operate said support between said base and said surface intermittently, and means to counter-balance the weight of said type-support upon the pivotal support of said links.

11. A printing machine, comprising an impression base and an ink surface, a type-support, a plurality of links pivotally supported and pivotally connected to said type-support, a gear connected to and movable with each link, means connecting said gears, to operate said support between said base and said surface intermittently, and means to counter-balance the weight of said type-support upon the pivotal support of said links.

12. A printing machine, comprising an impression base and an ink surface, a type-support, a plurality of links pivotally supported and pivotally connected to said type-support, a gear connected to and movable with each link, means connecting said gears, to operate said support between said base and said surface intermittently, means to counter-balance the weight of said type-support upon the pivotal support of said links, and a source of power connected to operate said gear-connecting means.

13. A printing machine, comprising an impression base and an ink surface, a type-support, a plurality of links pivotally supported and pivotally connected to said type-support, a gear connected to and movable with each link, means connecting said gears, to operate said support between said base and said surface intermittently, means to counter-balance the weight of said type-support upon the pivotal support of said links, means to connect said gear-connecting means to a source of power, and means to permit said type-support to yield with respect to said last-named means.

14. A printing machine, comprising an impression base and an ink surface, a type-support, a plurality of links pivotally supported and pivotally connected to said type-support, a gear connected to and movable with each link, means connecting said gears to operate the same in unison, means adapted to connect said last means to a source of power, and means to permit said type-support to yield with respect to said connecting means when approaching one limit of movement.

15. A printing machine, comprising an impression base and an ink surface, a type-support, a plurality of links pivotally supported and pivotally connected to said type-support, a gear connected to and movable with each link, means connecting said gears to operate the same in unison, means adapted to connect said last means to a source of power, means to permit said type-support to yield with respect to said connecting means when type carried by said type-support is in contact with an article upon said base.

16. A printing machine, comprising an impression base and an ink surface, a type-support, a plurality of links pivotally supported and pivotally connected to said type-support, means to operate each link, and means connecting said first means to operate said links in unison.

17. A printing machine, comprising an impression base and an ink surface, a type-support, a plurality of links pivotally supported and pivotally connected to said type-support, means to operate each link, means connecting said first means to operate said links in unison, and means to counter-balance the weight of said type-support.

18. A printing machine, comprising an impression base and an ink surface, a type-support, a plurality of links pivotally supported and pivotally connected to said type-support, means to operate each link, means connecting said first means to operate said links in unison, and means adapted to connect said last means to a source of power.

19. A printing machine, comprising an impression base and an ink surface, a type-support, a plurality of links pivotally supported and pivotally connected to said type-support, means to operate each link, means connecting said first means to operate said links in unison, means adapted to connect said last means to a source of power, and means to counter-balance the weight of said type-support.

20. A printing machine, comprising an impression base and an ink surface, a type-support, a plurality of links pivotally supported and pivotally connected to said type-support, means to operate each link, means connecting said first means to operate said links in unison, means adapted to connect said last means to a source of power, and means to permit said type support to yield with respect to said last-named connecting means when type carried by said support is in contact with an article upon said base.

21. A printing machine, comprising an impression base and an ink surface, a type-support, a pair of links pivotally supported and pivotally connected to said type-support, a gear connected to and movable with each link, a rack connecting said gears, to operate said links in unison, to oscillate said type-support between said base and said surface intermittently, and means carried by each link to counter-balance the weight of said type-support.

22. A printing machine, comprising an impression base and an ink surface, a type-support, a pair of links pivotally supported and pivotally connected to said type-support, a gear connected to and movable with each link, a rack connecting said gears, to operate said links in unison, to oscillate said type-support between said base and said surface intermittently, means carried by each link to counter-balance the weight of said type-support, means to connect said rack to a source of power, and means to permit said type-support to yield with respect to said last-named means when type carried by said support is in contact with an article upon said base.

In testimony whereof I have affixed my signature.

GEORGE FUSSELL.

Witness:
J. STUART FREEMAN.