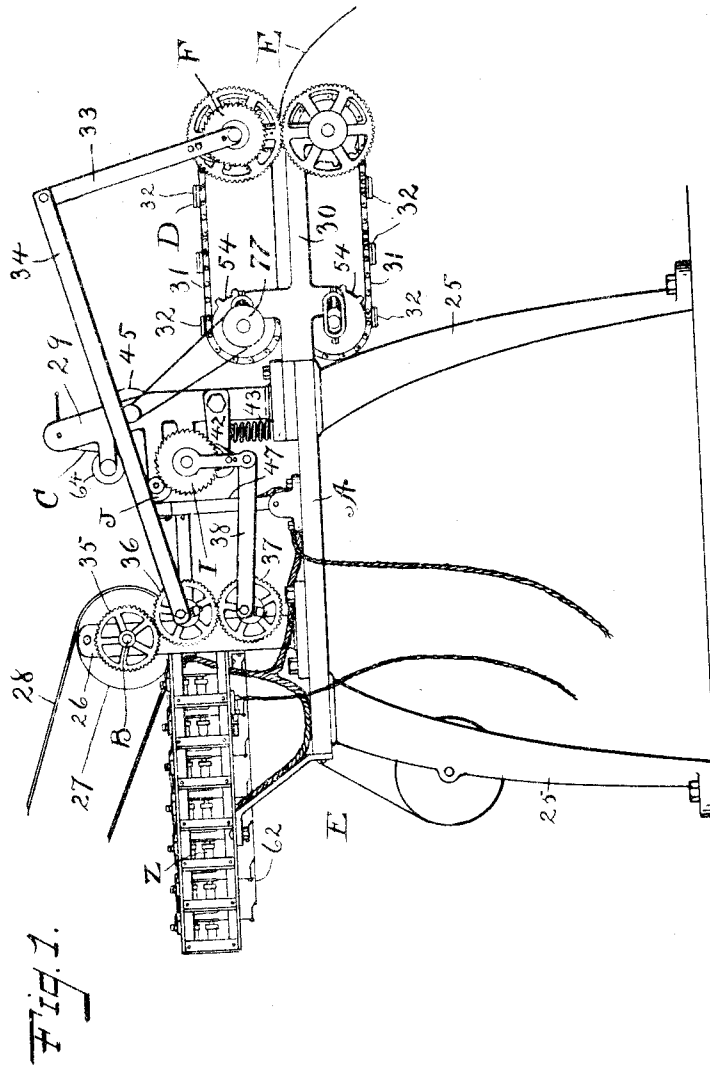


H. E. PROPSON.
MACHINE FOR MAKING PERFORATED SHEET MUSIC.
APPLICATION FILED NOV. 21, 1910.

Patented June 10, 1913.
9 SHEETS—SHEET 1.

1,064,253.



WITNESSES:-
S. H. Clarke
N. L. Lockwood

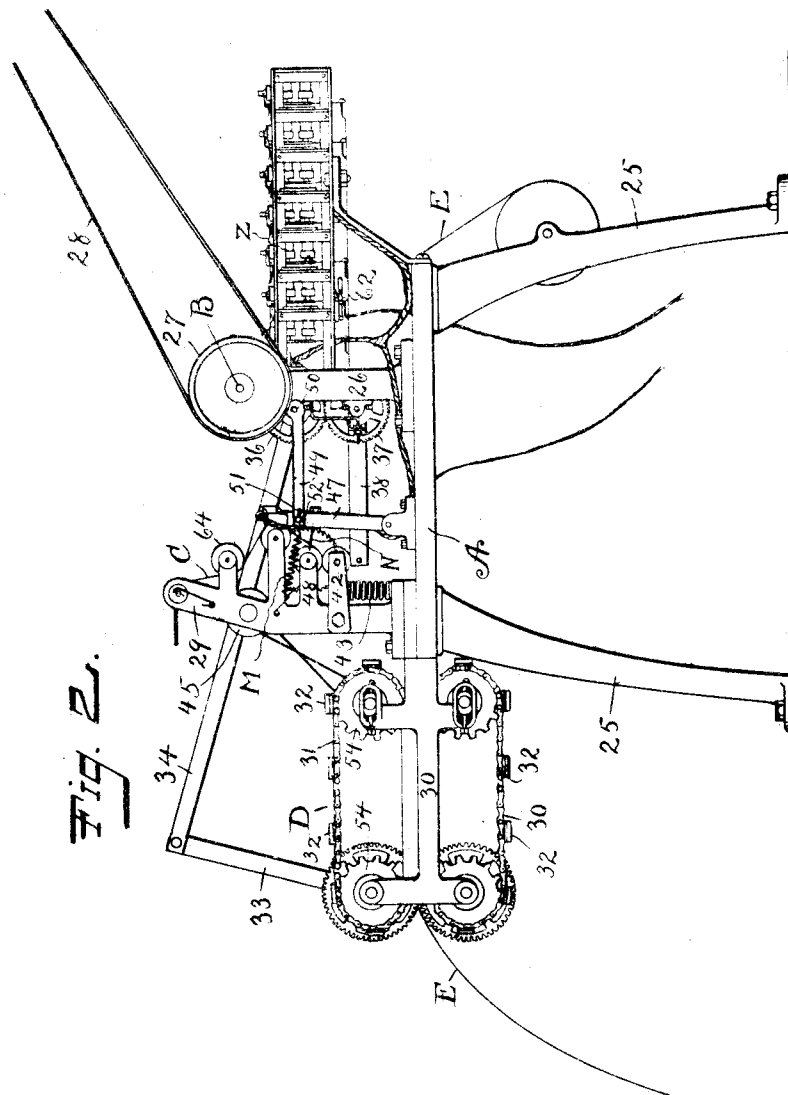
INVENTOR,
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9 SHEETS—SHEET 2.

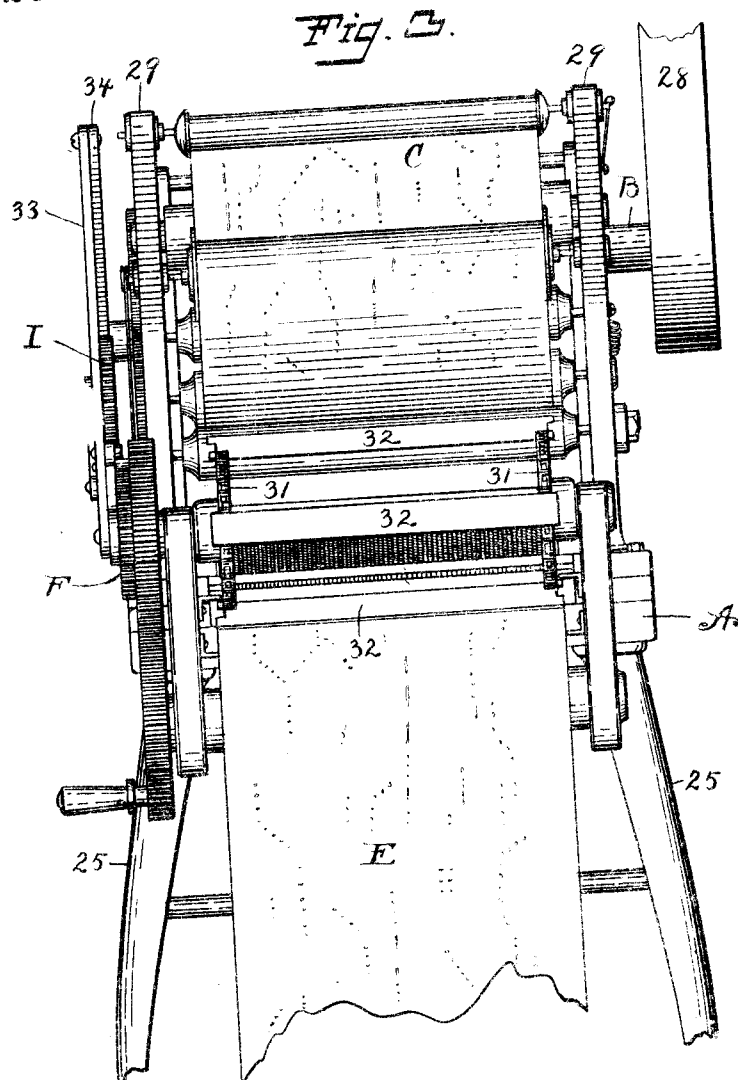


Witnesses.
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1,064,253.

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9 SHEETS—SHEET 3.



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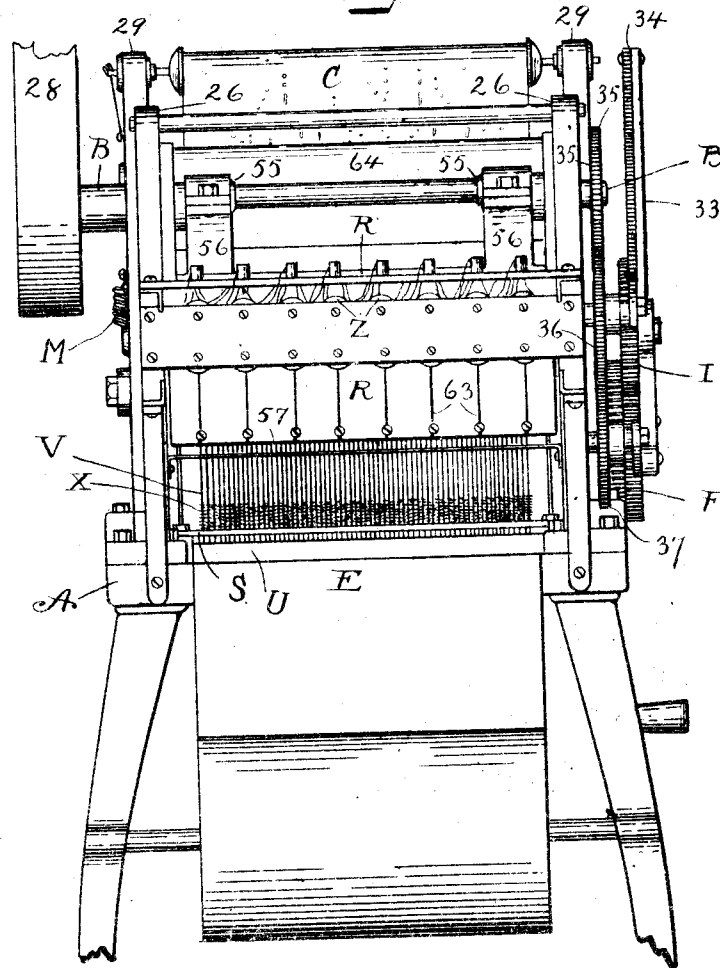
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9 SHEETS—SHEET 4.

Fig. 4.



Witnesses

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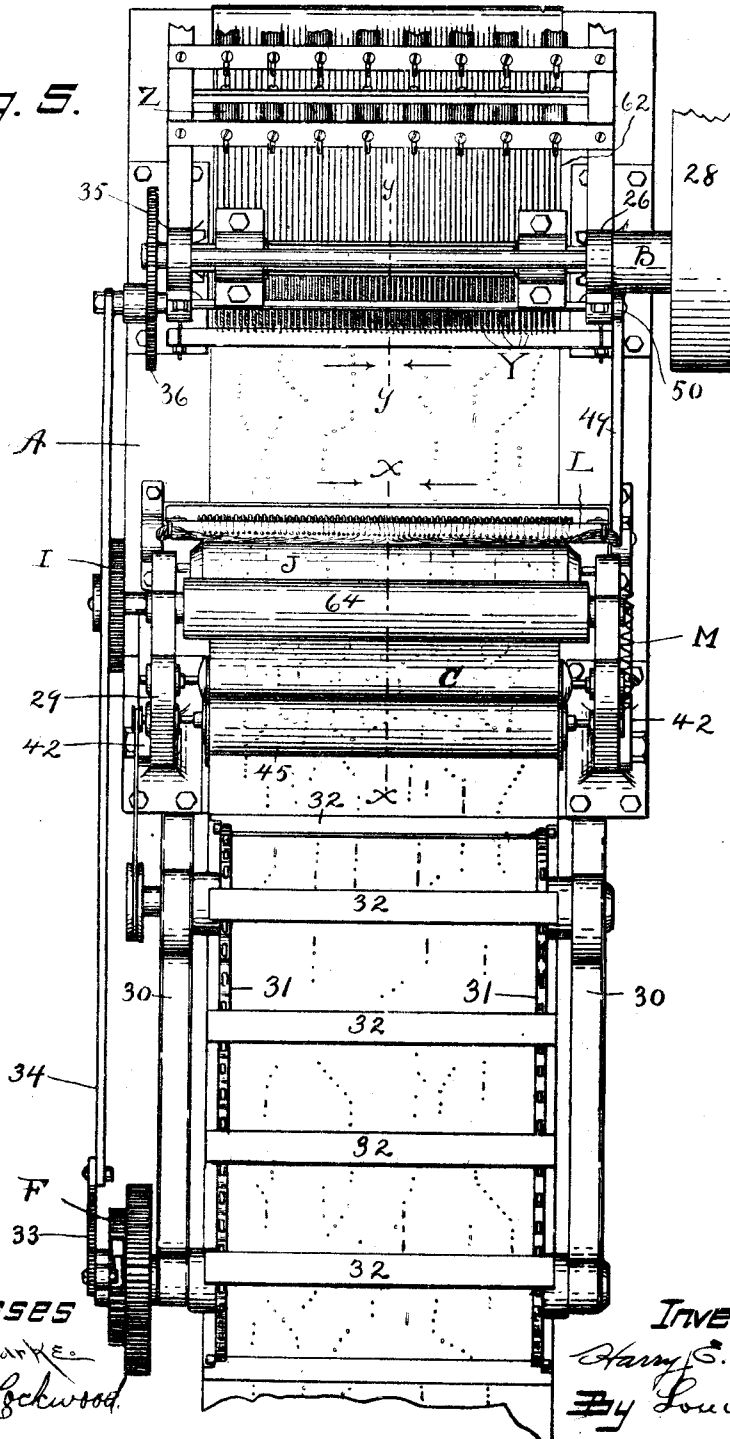
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9 SHEETS—SHEET 5.

Fig. 5.



Witnesses
S. H. Clarke
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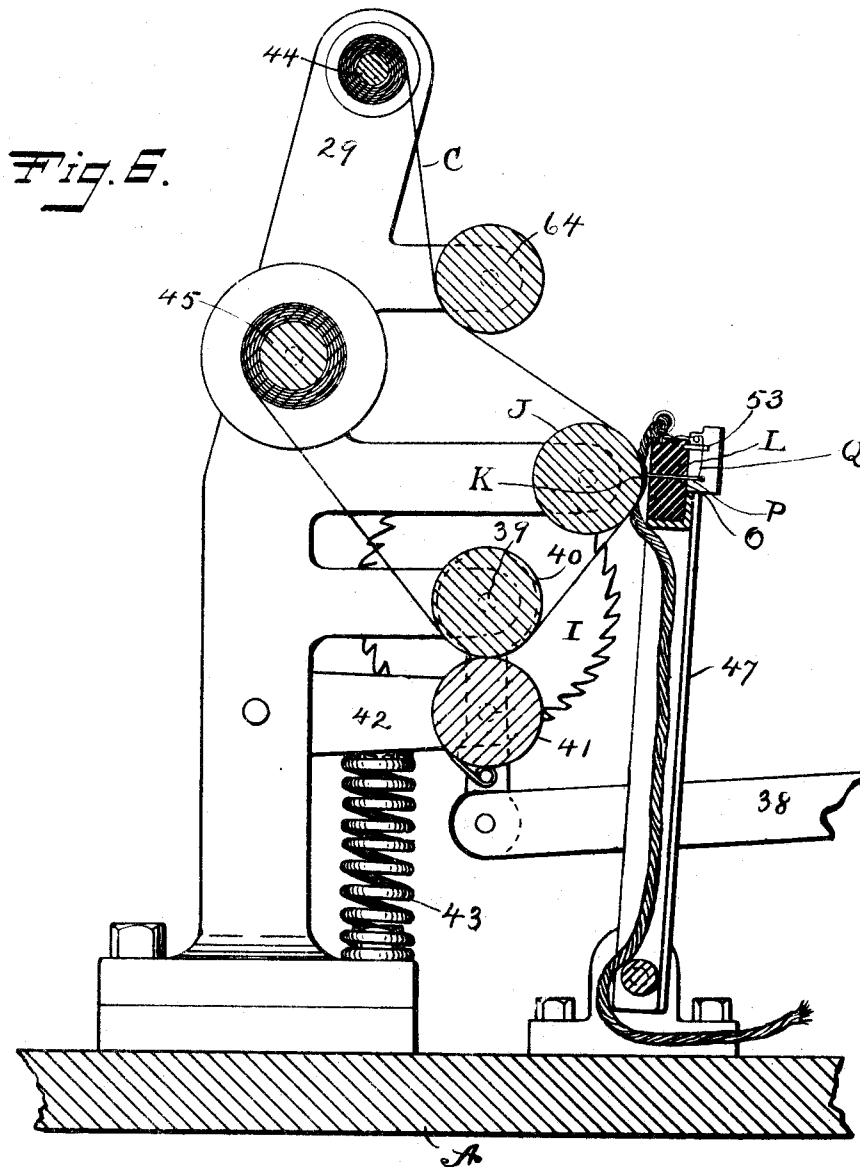
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9 SHEETS—SHEET 6.



Witnesses.

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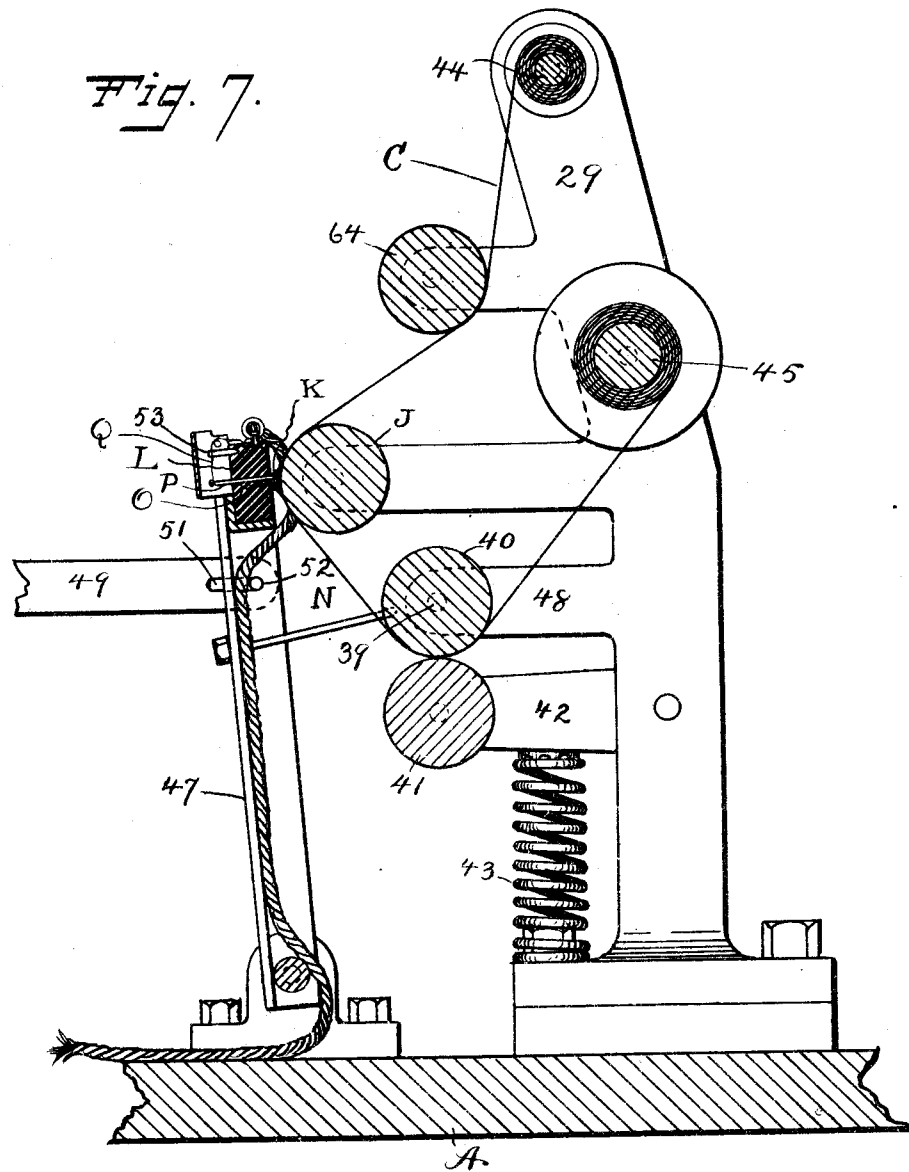
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H. E. PROPSON.
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9 SHEETS—SHEET 7.



Witnesses

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1,064,253.

9 SHEETS--SHEET 8.



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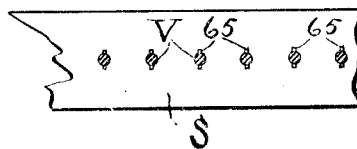


Fig. 10. Inventor.

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H. E. PROPSON.
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1,064.253.

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9 SHEETS—SHEET 9.

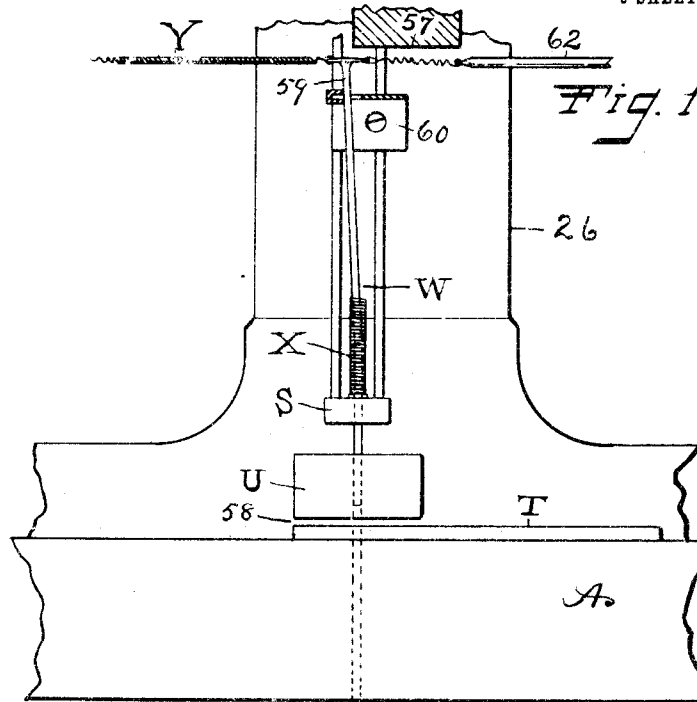


Fig. 11.

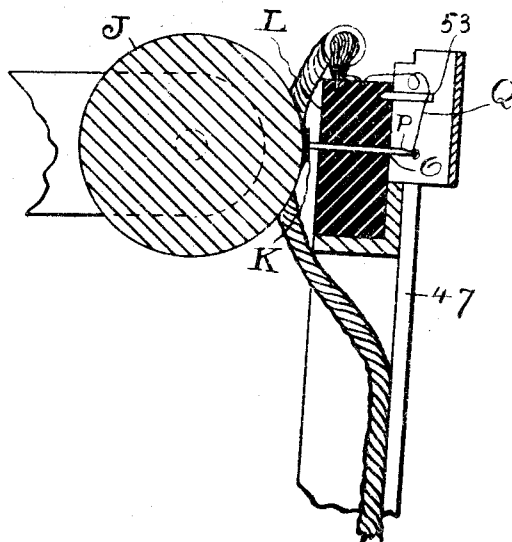


Fig. 12.

Witnesses
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Atty.

UNITED STATES PATENT OFFICE.

HARRY E. PROPSON, OF PLAINVILLE, CONNECTICUT, ASSIGNOR OF ONE-FIFTH TO CHARLES W. HIRD AND ONE-FIFTH TO FREDERICK D. HASTINGS, OF PLAINVILLE, CONNECTICUT, ONE-FIFTH TO HENRY O. SCHMIDT, OF NEW BRITAIN, CONNECTICUT, AND ONE-FIFTH TO LOUIS M. SCHMIDT, OF HARTFORD, CONNECTICUT.

MACHINE FOR MAKING PERFORATED SHEET-MUSIC.

1,064,253.

Specification of Letters Patent.

Patented June 10, 1913.

Application filed November 21, 1910. Serial No. 593,301.

To all whom it may concern:

Be it known that I, HARRY E. PROPSON, a citizen of the United States, residing at Plainville, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Machines for Making Perforated Sheet-Music, of which the following is a specification.

My invention relates to improvements in machines for making sheet music, and the objects of my improvements are simplicity and economy in construction and convenience and efficiency in use.

In the accompanying drawing:—Figure 1 is a side elevation of my improved machine. Fig. 2 is a view of the same taken from the side opposite to that shown in Fig. 1. Fig. 3 is a front end elevational view of the same. Fig. 4 is a rear end elevational view of the same. Fig. 5 is a plan view of the same. Fig. 6 is a sectional view on the line *x x* of Fig. 5. Fig. 7 is a similar view of the same section as viewed from the side opposite to that shown in Fig. 6. Fig. 8 is a sectional view on the line *y y* of Fig. 5 on a further enlarged scale. Fig. 9 is a sectional view on the line *z z* of Fig. 8. Fig. 10 is a sectional view on the line *v v* of Fig. 8. Fig. 11 is a side elevation showing the punch and other adjacent parts shown in Fig. 8, on a further enlarged scale. Fig. 12 is a view in part section and in part side elevation of certain parts shown in Fig. 2, on the same scale as Fig. 11.

A is the base of my machine and comprises a generally rectangular, flat, horizontal plate supported at a convenient height from the floor by means of four corner legs 25. A pair of standards 26 extending upward from the said base A operatively support the main driving shaft B which carries the driving wheel 27 and which is driven by the belt 28, the location of the said standards 26 being intermediate the ends of the said base A and the said standards are provided with punch operating mechanism to be described. At the forward end of the said base A are provided a second set of upright standards 29 which have means to be described, for operating the master sheet C, and there is also at the said forward end an extension in the form of side brackets 30 which support

suitable product feeding mechanism D for feeding the paper sheet or sheets E which has been operated on and suitably perforated by the punches to be described. As shown the said product feeding mechanism D comprises a pair of endless chain belts 31 which carry each a set of cross strips 32, which latter meet as the said chains move along in synchronism and grip the perforated sheet E, carrying the same along, the said sheet being pulled over the entire length of the said base A and delivered at the front end of the said feeding mechanism D. The operation of the feeding mechanism D is intermittent and is effected by ratchet mechanism F that is operated by lever arm 33 and link 34, which latter is given a reciprocal motion by the eccentric connection of the same to the counter shaft G and which counter shaft is turned by the gear 36 which is mounted thereon and meshes with the gear 35 on the said main shaft B. A third gear 37 on a second counter shaft H and meshing with the gear 36 provides a corresponding reciprocal motion to a link 38 by means of ratchet mechanism I and which serves to give a movement to the said master sheet C corresponding to the movement of the said perforated product sheet E. A shaft 39 intermittently operated by the said master ratchet mechanism I carries a friction roll 40, and by means of a cooperating friction roll 41 serves to feed the said master sheet. The said cooperating friction roll 41 is supported by its ends by a pair of swinging arms 42, pivotally mounted on the said standards 29 and held resiliently in contact with the said driving roll 40, or the master C interposed between the same, by means of springs 43. The initial position of the said master C is on the roll 44 which is mounted at the upper ends of the said standards 29 and the same passes over a contact roll J, being suitably guided by a guide roll 64 and passes from the said contact roll to the said feeding friction rolls 40 and 41 and from these is delivered to the receiving roll 45 which is operated in an ordinary manner to take up the master sheet C as it is delivered from the said feeding friction rolls 40 and 41, the operation of the said receiving roll 45 as shown being by means of a belt wheel 77 mounted on the

same shaft as one of the sprocket wheels 54 carrying one of the endless chains 31 of the said product feeding mechanism D. The said contact roll J is normally stationary and serves as a friction guide for the master sheet C and is provided on the face directed generally toward the punches with a longitudinally extending contact strip K which may be insulated from the said contact roll J, and the said strip is in the electrical circuit of the selector mechanism to be described.

The said selector mechanism comprises a pair of swinging arms 47, pivotally mounted by their lower ends to the said base A and extending upward therefrom, which are cross connected at their upper ends by a selector guide piece or block L, which is of insulating material. A spring M tends to swing the said arms 47 so as to bring the said selector guide block L toward the said contact roll J and the extent of such movement is limited by an adjustable stop N in abutment with a rigid cooperating stop such as the arm 48 on one of the said uprights 29. Normally the said selector guide block L is held away from the said contact roll by a link 49, which link is operated reciprocally in an ordinary manner, as by means of a pin 50, which pin is eccentrically located at the end of the said counter shaft G, and to which pin one end of the said link is operatively connected. The other end of the said link 49 is provided with a sliding connection with one of the said swinging arms 47 comprising a longitudinal slot 51 in the said link and a pin 52 fixed in the said arm 47 fitting the said slot 51, the relation of the said slot and pin being such that they are normally in engagement so as to hold the said selector guide block L away from the said contact roll J as described, and will permit the same to be held in a definite position relatively to the said guide roll, determined by the said stop N and its cooperating arm 48, during an appreciable angular movement of the said counter shaft G, and during which movement the said pin 52 travels longitudinally in the said slot 51. The said selector guide block L comprises a set of holes O for selector pins P and between adjacent holes a spring guide plug or peg 53 of insulating material. Each of the said pins P comprises a straight piece of wire which is a fit for the said hole O and suitable for longitudinal movement therein, and is of such length as to pass through the said selector guide block L so that one end will project toward the said contact roll J and the other end on the other side of the said block will receive a spring Q, to one end of which it is secured. The other end of the said spring Q is secured to the said block L. The said spring serves to resiliently hold the said contact pin P re-

siliently in the direction of the said contact roll J and is also, in each case, electrically connected so as to provide an individual or selector circuit for each of the said selector pins P. Accordingly, each pin P serves as a means for closing an electric circuit when brought into contact with the said contact roll J. Each of the said pins P is headed so as to limit the forward movement of the same due to the action of the said contact pin springs Q. The said main shaft B is provided with a pair of eccentrics 55 to which are connected a pair of plates 56 which operate as connecting rods and serve to give vertically reciprocating motion to a hammer plate or platen R which is laterally guided by the said standards 26 and which is provided at its lower end with a hammer surface 57 suitable for operating the punches by a hammer blow. A punch lifting bar S is supported from the said platen below the said hammer surface 57 and has a reciprocal motion corresponding to that of the said platen R. Between the said lifting bar S and the base A there is a die plate T directly on the said base and a stripping block U immediately above the same and separated therefrom by a space 58 suitable for admitting the sheet E to be perforated.

The punch V comprises a straight piece of wire and is provided with an upward extension W of similar wire to which it is flexibly connected by means of a spring X. The upper end 59 of the said extension W is normally held away from contact position with the said hammer surface 57 by means of a spring Y and the same is brought into contact position and in direct alignment with the said punch V by means of an electromagnet Z when the same is energized by the closing of the electric circuit for the winding of the same by the contact made by the corresponding selector pin P with the said contact roll J. A bar 60 limits the lateral motion of the said upper end 59 of the extension W.

As shown in Fig. 8 an extension W of one of the punches V has its upper end in alignment with the punch V and directly under the said hammer surface 57 and accordingly in position to force the punch downward through the paper to be perforated, being guided by holes fitting the punch in the lifting bar S and the stripping block U, and another extension W is shown having its upper end clear of the said hammer surface 57 and beyond the edge 61 of the same, which is the normal position and in which it is held by the action of the spring Y. The extensions are brought to the operating position in opposition to the said spring Y by the closing of the proper electric circuit in the manner described by means of a link 62 which is operatively connected to the arma-

ture 63 of the said electromagnet Z, and to the said upper end. The said link 62 and spring Y serve to position the upper end of the extension W laterally. The said punches V are provided near their upper ends with transversely extending lugs or pins 65, which engage with the lifting bar whereby the punch is raised to normal position after having been operated to make a perforation in the paper. There are as many punches V as notes to be desired in the perforated sheet, and there is an electromagnet and selector finger corresponding to each punch. The lifting bar and stripping plate each have holes fitting the punches, as also the die plate.

In operation, the master and the paper sheet to be perforated are intermittently fed along and brought to rest, and while in the latter condition the selector fingers are moved to the position for making contact with the contact block and moved away from the same. When in the contact position, with paper of the body of the master interposed between the selector finger and the contact roll there is no closing of an electric circuit and consequently no operation of the punch. In case however the selector finger is in line with a perforation in the master electrical contact is made which serves through the corresponding electromagnet to bring the corresponding punch into action and reproduce the note of the master in the copy. After the punch has done its work it is lifted to normal position by the lifting bar. The selector fingers are arranged in alinement, and are as described arranged to permit of contact with the contact roll for an appreciable interval of time, and the direction of the movement of the selector fingers is essentially rectilinear.

I claim as my invention:—

1. In a machine for making perforated sheet music having means for feeding a master sheet and means for feeding a copy sheet, and punches suitable for perforating the said copy sheet, selector means for operating the said punches comprising a contact roll and a plurality of contact fingers, and means for bringing the said fingers into contact position relatively to the said roll, the said contact roll being fixed and rigid during such movement of the contact fingers and provided with a single electrical contact coöperative with the said fingers, and means for bringing the said fingers into contact position bodily and by a relatively longitudinal movement thereof.

2. In a machine for making perforated sheet music having means for feeding a master sheet and means for feeding a copy sheet, punches for perforating said copy sheet and means for operating said punches responsive to perforations in the said master sheet comprising a stationary contact piece,

selector contact fingers, and means for moving the said contact fingers relatively to the said master sheet, the said latter means comprising a radial arm, pivoted by one end and having means for supporting the said contact fingers at the other end.

3. In a machine for reproducing perforated sheet music from a master sheet, a stationary contact piece over which the master travels, a selector block having a reciprocal motion and penetrated by a set of holes, selector contact fingers fitting and passing through the said holes, each of the said fingers comprising a piece of straight wire, a spring, one end of the said spring being connected to one end of the said wire, the other end of the said spring being fixed to the said block and the body portion of the said spring being positioned in the same plane as the said wire.

4. A machine for reproducing perforated sheet music comprising electrically operated selector mechanism having a stationary contact piece and selector contact fingers, a selector block supporting the said fingers and having a reciprocal motion relatively thereto, means for permitting the said fingers to remain stationary and in contact position during a portion of the motion of the said block relatively to the said contact piece.

5. A machine for making perforated sheet music having means for moving a copy sheet, punching mechanism comprising a punch, a punch extension flexibly connected therewith by one end and having the other end normally held out of alinement therewith, and means for operating the punch comprising a platen having reciprocal motion in alinement with the said punch and means for bringing the said other end of the extension in alinement with the said platen and punch, and the means for connecting the said punch and extension comprising a single coil spring.

6. In a machine for making perforated sheet music, a punch comprising a straight piece of wire, guiding means therefor, a punch extension connected by one end to the said punch and having means for moving the other end into position of alinement with the said punch and away from said position, and a platen having a reciprocal motion in alinement with the said punch, the said punch and extension having their ends in abutment and means for maintaining the said ends in abutment.

7. In a machine comprising a punch, a punch extension having one end connected therewith, and having a free end, spring means connected to the said free end and tending normally to hold the same away from position of alinement with the said punch, electrical means operative through connecting mechanism to bring the said free

end into such position of alinement in opposition to the said spring means, the said connecting mechanism and spring means operative normally to determine the plane of the movement of the said free end.

8. In a machine for making perforated sheet music having means for moving a copy sheet and punching mechanism comprising a punch and a punch extension, the said punch comprising a straight piece of wire, the said punch extension comprising a second straight piece of wire and in alinement with the said punch, the adjacent ends of the said punch and extension being in abutment, and means for maintaining the said ends in abutment.

9. In a machine for making perforated sheet music having a punch and a punch extension, the said punch and extension being in alinement and having the ends in abutment, a flexible connection operative to hold the said ends in abutment and the said con-

nection consisting of a single helical coil spring.

10. In a machine for making perforated sheet music comprising selector mechanism having contact fingers having reciprocal motion relatively to a contact block, spring means tending normally to hold the said fingers in contact position, reciprocative means having connection with the said fingers and operative to provide such reciprocal motion, and in opposition to the said spring means, the said connection comprising a pin and a slot in which the said pin has reciprocal movement, whereby the said fingers are held stationary during a portion of the period of movement of the said reciprocating means.

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Witnesses:

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