

C. L. LILLEBERG.
PERFORATING MACHINE.

APPLICATION FILED MAR. 31, 1909. RENEWED MAY 31, 1911.

1,042,453.

Patented Oct. 29, 1912.

Fig. 1.

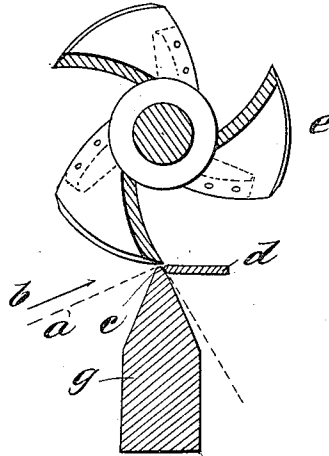
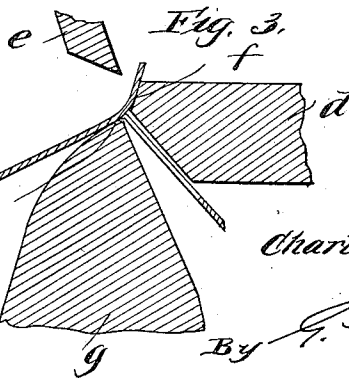
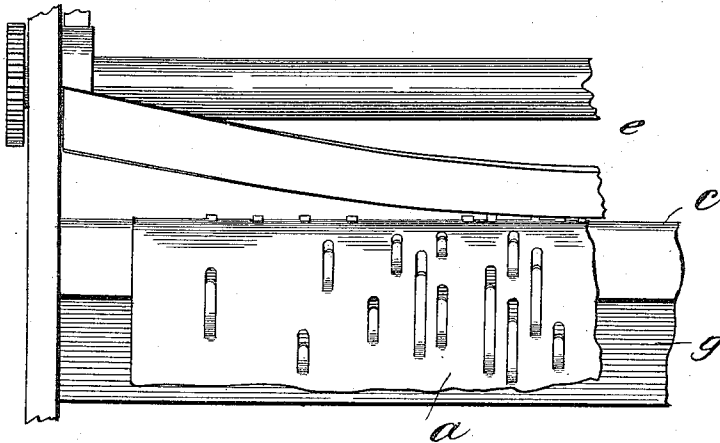


Fig. 2.



Witnesses:

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Att'y

UNITED STATES PATENT OFFICE.

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PERFORATING-MACHINE.

1,042,453.

Specification of Letters Patent.

Patented Oct. 29, 1912.

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To all whom it may concern:

Be it known that I, CHARLES L. LILLEBERG, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Perforating-Machines, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to perforating machines and is of particular service when adapted to the purpose of cutting music sheets that are to be used in connection with mechanism for playing pianos and organs. I do not wish to be limited, however, to the employment of the machine of my invention for the perforation of paper that is to be used in connection with musical instruments.

Machines have hitherto been devised whereby cutting tools were enabled to cut from the paper to be perforated, tongues of paper co-extensive with the length and size of the perforations to be formed, said cutting tools, however, not being adapted to completely sever the tongues from the paper, knives, some of which are revolving, being brought into play to trim off the tongues to their bases pretty much in the same manner as a lawn mower operates to trim off blades of grass. Air under pressure has hitherto been employed for blowing the tongues into proper angular positions with respect to the general plane of the paper, so as to place said tongues in operative relation with the knives that are to cut the same off, this result being accomplished by causing the paper to pass over a pneumatic tracker board having openings in line with the tongues, through which openings streams of air would issue when the tongues would overlies the same, whereby said tongues would be forced into operative relation with the cutting knives. It must be apparent to those skilled in the art, that an enormous amount of energy would be required to enable the air to perform this function.

My invention provides means whereby streams of air need not be employed to project the tongues of paper into proper positions, whereby I am enabled greatly to economize in the operation of the perforating machine. I employ mechanical instead of pneumatic means for bending the tongues of

paper to cause them to occupy proper positions with respect to the knives.

I will explain my invention more fully by reference to the accompanying drawing, showing the preferred embodiment thereof, in which—

Figure 1 is a sectional elevation of a machine constructed in accordance with the invention. Fig. 2 is a plan view of part of the mechanism. Fig. 3 is an enlarged view of a part of the structure shown in Fig. 1.

Like parts are indicated by similar characters of reference throughout the different figures.

In the drawing I have not illustrated any of the mechanism for forming the tongues of paper in the paper sheet, such as is well known to those skilled in the art and is exemplified by the disclosure furnished by Patent No. 854,822, granted to A. L. Hart May 28, 1907. Nor have I shown the reel from which the blank paper is supplied, nor the reel upon which the perforated paper is wound, as these also are details familiar to those skilled in the art. I have only deemed it necessary to illustrate those parts of a machine constructed in accordance with my invention where my improvement has been supplied to enable me to overcome objections which have hitherto existed in this class of apparatus, and which objections, though not sufficient to prevent the cutting of paper adapted for commercial purposes, are, however, such as to prevent the paper from being perforated at as low an expense as is desirable.

The sheet of paper *a* passes in the direction indicated by the arrow *b* from the mechanism that forms the tongues in the paper, the paper being caused to turn a comparatively sharp angle at *c*, where the free ends of the tongues are presented to the stationary knife *d* and thereafter to the revolving knives *e*, the paper, by being caused to have the angular deflection at *c*, forcing the tongues of paper as they reach the angle *c* to follow in a plane which forms with the paper approaching the point *c*, an obtuse angle, in the embodiment of the invention illustrated. The stationary knife *d* is chamfered at *f* along the upper portion of the knife edge, whereby the knife *d* presents at *f* a surface coinciding generally with the direction that the tongues of paper are forced to take, the surface *f* acting as a

means for guiding the paper tongues to the revolving knives.

In order to cause the paper to have the angular formation at *c* and thereby properly present the paper tongues to the revolving knives, I provide a ridge-bar *g* onto and from which the paper is led at the desired angle, the ridge-bar *g* operating upon the paper to force the tongues away from the general plane of the paper and to cause them to follow paths substantially coincident with the guiding surface *f*, whereby said tongues are properly directed to the revolving cutting knives, it being understood that the elements *d*, *e* and *g* are properly relatively adjusted so that the paper tongues may be properly directed to the cutting knives.

In the preferred embodiment of the invention, the surface of the ridge-bar *g* initially engaged by the paper *a*, is slightly rounded, as indicated, and the surface that is engaged by the paper when following its downward path is desirably plane, so that somewhat of an edge is presented to the paper in close proximity to the knife, whereby the point where the paper tongue is to be upwardly deflected is accurately determined.

I have not shown any means for removing the paper comminuted by the knives *d* and *e*, as any means, pneumatic or otherwise, that are adaptable may be employed for this purpose as is preferred.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:—

1. A perforating machine of the class which has means for cutting tongues in a sheet, which machine includes means for removing the tongues from the sheet, and means located in coöperative relation with the aforesaid means and acting mechanically upon the tongues to present the same to the aforesaid means.

2. A perforating machine of the class which has means for cutting tongues in a sheet, which machine includes cutting mechanism for removing the tongues from the sheet, and means located in coöperative relation with said cutting mechanism and acting mechanically upon the tongues to present the same to said cutting mechanism.

3. A perforating machine of the class which has means for cutting tongues in a sheet, which machine includes cutting mechanism for removing the tongues from the sheet, said cutting mechanism including stationary and revolving knives, and means located in coöperative relation with said cutting mechanism and acting mechanically upon the tongues to present the same to said cutting mechanism.

4. A perforating machine of the class which has means for cutting tongues in a

sheet, which machine includes cutting mechanism for removing the tongues from the sheet, said cutting mechanism including stationary and revolving knives, and means located in coöperative relation with said cutting mechanism and acting mechanically upon the tongues to present the same to said cutting mechanism, the stationary knife of said cutting mechanism having a directing surface at its cutting edge serving to guide the tongues between the stationary and rotating knives.

5. A perforating machine of the class which has means for cutting tongues in a sheet, which machine includes means for removing the tongues from the sheet, and a ridge-bar located in coöperative relation with the aforesaid means and acting mechanically upon the tongues to present the same to the aforesaid means.

6. A perforating machine of the class which has means for cutting tongues in a sheet, which machine includes cutting mechanism for removing the tongues from the sheet, and a ridge-bar located in coöperative relation with said cutting mechanism and acting mechanically upon the tongues to present the same to said cutting mechanism.

7. A perforating machine of the class which has means for cutting tongues in a sheet, which machine includes cutting mechanism for removing the tongues from the sheet, said cutting mechanism including stationary and revolving knives, and a ridge-bar located in coöperative relation with said cutting mechanism and acting mechanically upon the tongues to present the same to said cutting mechanism.

8. A perforating machine of the class which has means for cutting tongues in a sheet, which machine includes cutting mechanism for removing the tongues from the sheet, said cutting mechanism including stationary and revolving knives, and a ridge-bar located in coöperative relation with said cutting mechanism and acting mechanically upon the tongues to present the same to said cutting mechanism, the stationary knife of said cutting mechanism having a directing surface at its cutting edge serving to guide the tongues between the stationary and rotating knives.

9. A perforating machine of the class which has means for cutting tongues in a sheet, which machine includes means for removing the tongues from the sheet, and a ridge-bar presenting a defined edge to the paper and located in coöperative relation with the aforesaid means and acting mechanically upon the tongues to present the same to the aforesaid means.

10. A perforating machine of the class which has means for cutting tongues in a sheet, which machine includes cutting

mechanism for removing the tongues from the sheet, and a ridge-bar presenting a defined edge to the paper and located in co-operative relation with said cutting mechanism and acting mechanically upon the
5 tongues to present the same to said cutting mechanism.

11. A perforating machine of the class which has means for cutting tongues in a
10 sheet, which machine includes cutting mechanism for removing the tongues from the sheet, said cutting mechanism including stationary and revolving knives, and a ridge-
15 bar presenting a defined edge to the paper and located in coöperative relation with said cutting mechanism and acting mechanically upon the tongues to present the same to said cutting mechanism.

12. A perforating machine of the class
20 which has means for cutting tongues in a sheet, which machine includes cutting mechanism for removing the tongues from the sheet, said cutting mechanism including stationary and revolving knives, and a ridge-
25 bar presenting a defined edge to the paper and located in coöperative relation with said cutting mechanism and acting mechanically upon the tongues to present the same to said cutting mechanism, the stationary knife of
30 said cutting mechanism having a directing

surface at its cutting edge serving to guide the tongues between the stationary and rotating knives.

13. A perforating machine of the class which has means for cutting tongues in a
35 sheet, which machine includes cutting mechanism for removing the tongues from the sheet, said cutting mechanism including stationary and revolving knives, the stationary knife of said cutting mechanism having a
40 directing surface at its cutting edge serving to guide the tongues between the stationary and rotating knives.

14. A perforating machine of the class
45 which has means for cutting tongues in a sheet, which machine includes cutting mechanism for removing the tongues from the sheet, said cutting mechanism including stationary and revolving knives, a directing
50 surface being associated with the stationary knife for guiding the tongues between the stationary and rotating knives.

In witness whereof, I hereunto subscribe my name this 15th day of March A. D., 1909.

CHARLES L. LILLEBERG.

Witnesses:

G. L. CRAGG,
L. G. STROH.