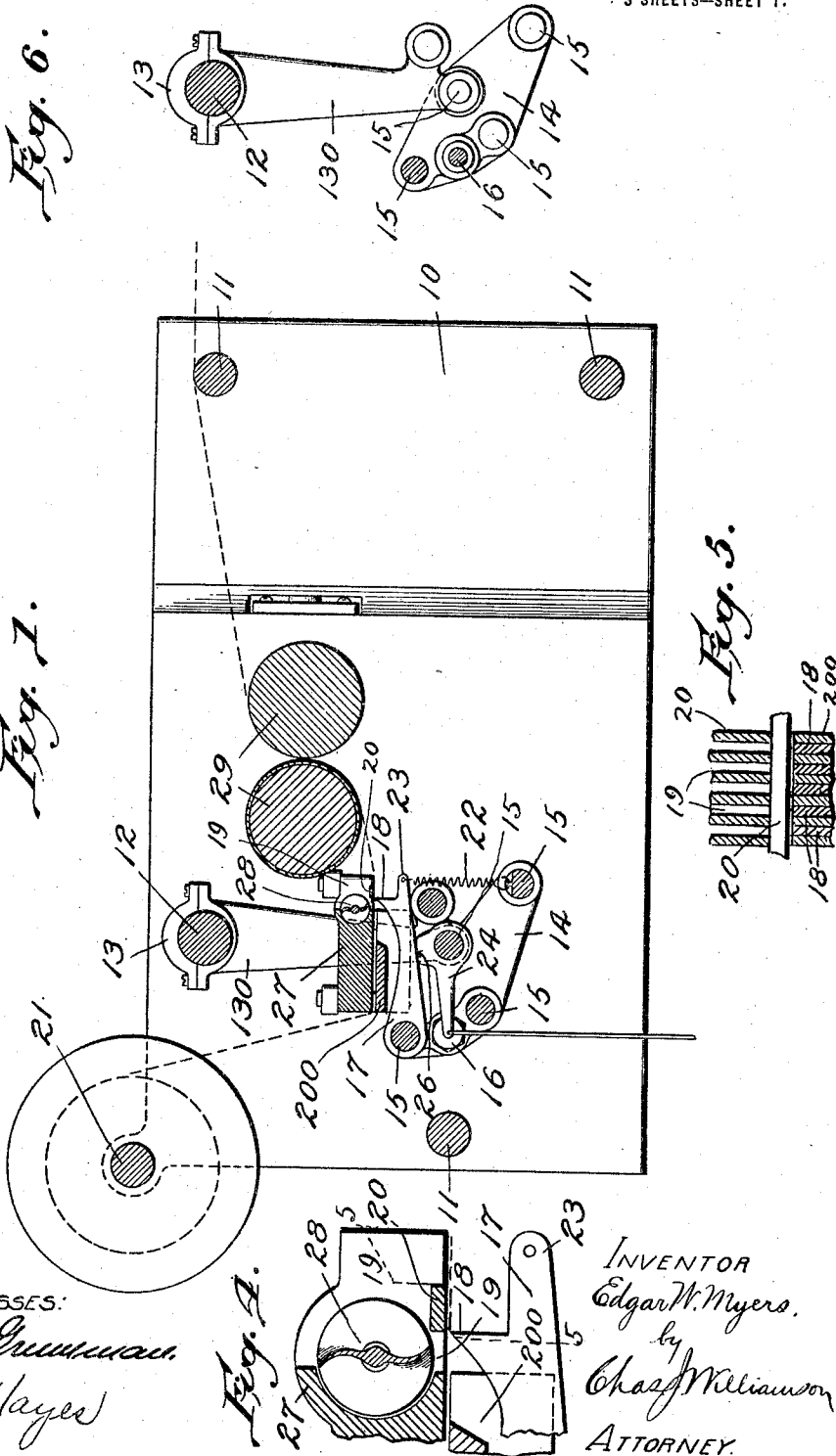


E. W. MYERS.
MACHINE FOR PERFORATING SHEET MATERIAL.
APPLICATION FILED JUNE 19, 1914.

1,275,977.

Patented Aug. 13, 1918.

3 SHEETS—SHEET 1.



WITNESSES:

C. S. Schuman.

A. P. Hayer

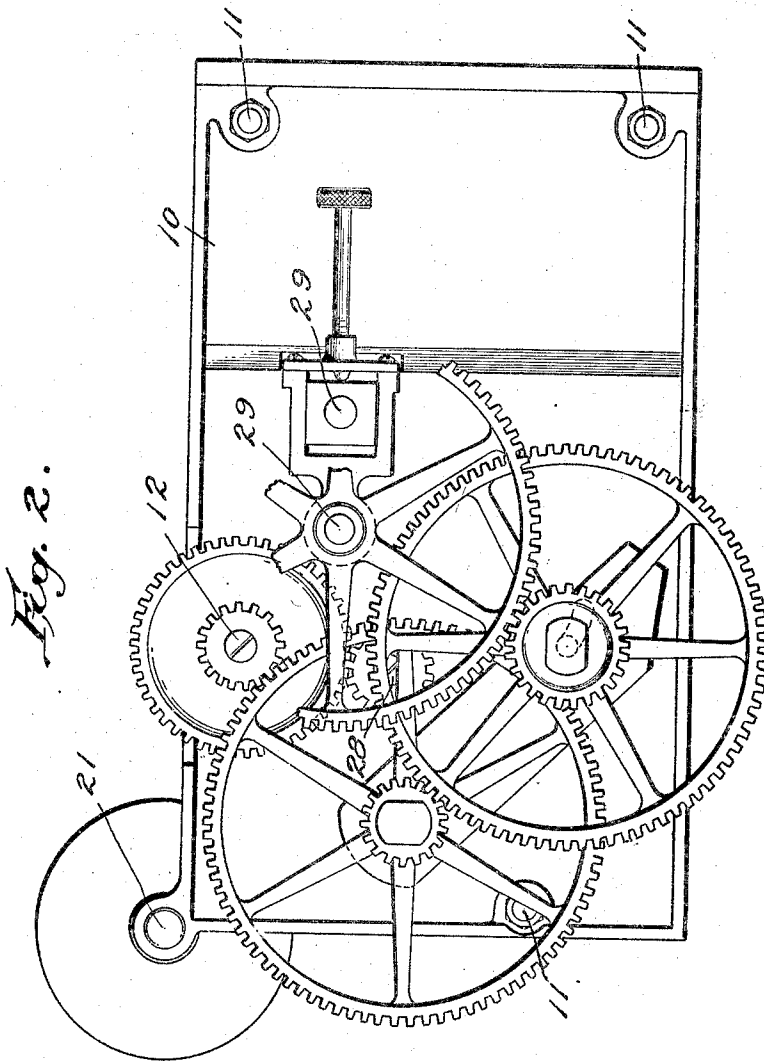
Fig. 4.

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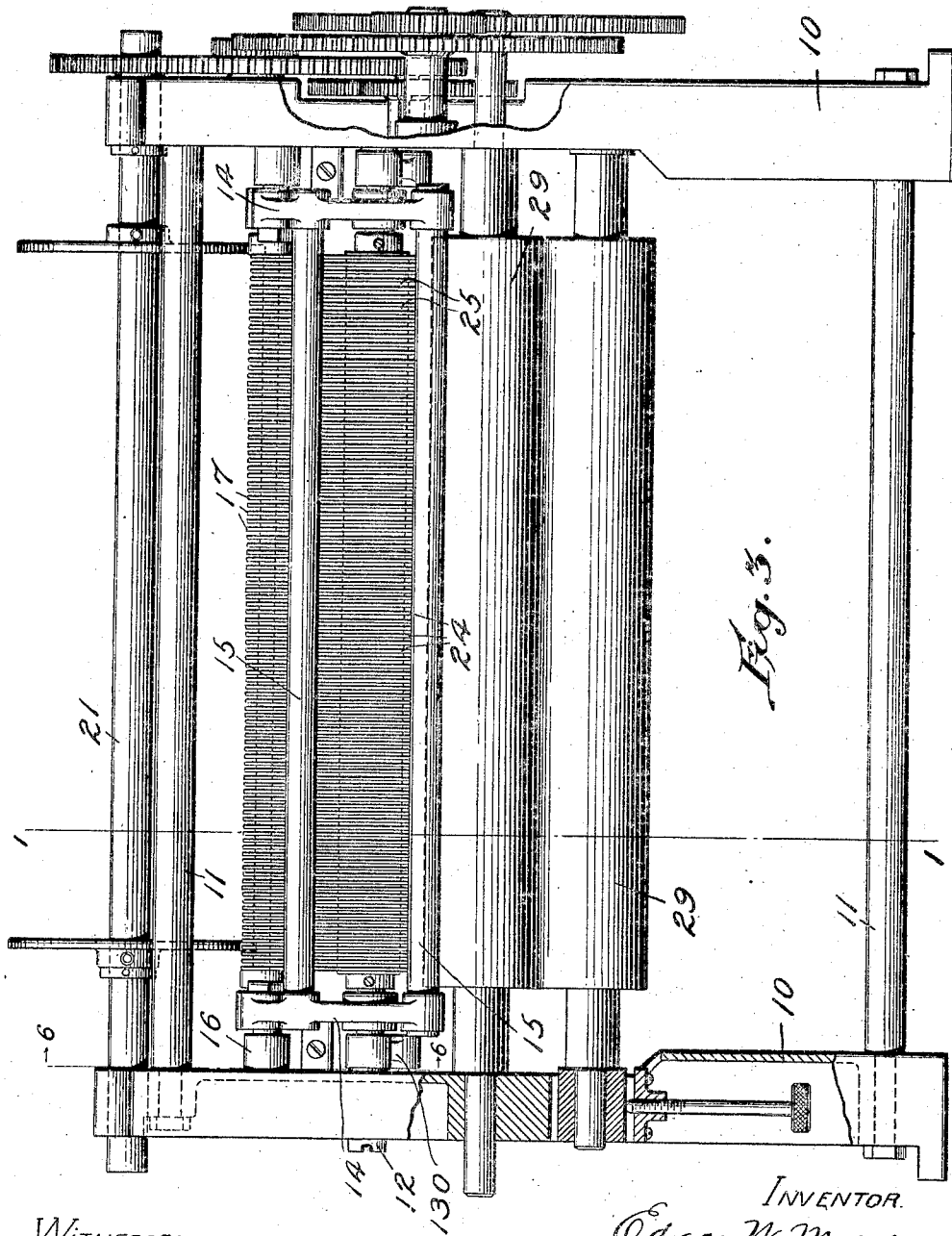
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WITNESSES:
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UNITED STATES PATENT OFFICE.

EDGAR W. MYERS, OF SAN JOSE, CALIFORNIA, ASSIGNOR TO FILMUSIC COMPANY, A CORPORATION OF CALIFORNIA.

MACHINE FOR PERFORATING SHEET MATERIAL.

1,275,977.

Specification of Letters Patent.

Patented Aug. 13, 1918.

Application filed June 19, 1914. Serial No. 846,178.

To all whom it may concern:

Be it known that I, EDGAR W. MYERS, of San Jose, in the county of Santa Clara, and in the State of California, have invented
5 a certain new and useful Improvement in Machines for Perforating Sheet Material, 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 the object of my invention is to
10 provide a machine for this purpose possessing high efficiency and greater speed than has heretofore been produced to my knowledge, and for the attainment of this object and others, which will be evident to those skilled in the art when the nature of the invention is understood, I have embodied my invention in the machine having the construction substantially as hereinafter specified and claimed.

25 In the accompanying drawings—

Figure 1 is a vertical section of a machine embodying my invention;

Fig. 2 is an end elevation thereof;

Fig. 3 is a bottom-plan view of the same;

30 Fig. 4 is a detail view in section on a larger scale of the cutting mechanism, the section corresponding with Fig. 1;

Fig. 5 is a detail view in section on the line 5—5 of Fig. 4.

35 Fig. 6 is a detail view of the cutter mechanism supporting and vibrating devices.

Briefly described, my invention comprehends a machine having a gang, or series of cutters corresponding in number to the range
40 of notes to be reproduced past which the master sheet paper is fed, and means for causing the action of the desired cutters at the proper time, and for the proper period required by the time value of the notes to be reproduced.

Proceeding now with a detailed description of the machine shown in the drawings, it will be found to comprise a frame which consists of two end plates 10 and several
50 parallel rods, or bolts 11, which connect them

together and rigidly space them apart. Journaled in bearings in the end plates is a main driving shaft 12, which at one end where it passes through one of the end plates, is provided with suitable means for
65 connecting it with a source of power. Adjacent to the inner side of each end plate 10, said driving shaft has an eccentric 13 upon which is mounted a pitman, or link 130. Pivotally connected with each pitman 60 is a light open-work frame that consists of two side bars 14 one at the inner side of each pitman and several parallel rods 15 which extend between and are connected to said side bars, and said frame is pivotally
65 connected by each of its side bars to a stud 16 on the inner side of one of the side plates 10 so that an oscillating movement is imparted thereto by the action of the eccentrics on the main shaft. Pivotally hung on
70 one of said rods 15 are the cutters 17, they being spaced apart side by side so that the proper side by side spacing of the perforations in the master sheet may be secured. Each of the cutters has a blade 18 which is
75 tapered to a sharp point and each is situated opposite, or in alinement with a slot 19 in a bar 20 which extends parallel with the series of cutters and is rigidly fastened at its opposite ends to the respective side plates
80 10 of the machine, such bar by reason of the series of slots 19 having a comb-like appearance. The sheet of paper to be perforated passes from a roll, or spool 21, suitably supported by the side plates 10, over the face or
85 side of said comb bar toward the cutters and it will be seen that when the cutters are moved on their pivots, as hereinafter described, in correspondence with the actuation of the playing instrument keys, the cutter
90 blades will be passed through the paper and into their respective slots and the cutters being rapidly oscillated by the action of the eccentrics of the main shaft will cut the holes, or slots in the paper by a shear-like
95 action, the length of the hole or slot cut being dependent upon the duration, or period of time that the instrument key is depressed. As the cutter blades are not withdrawn from the paper so long as the piano, or instrument 100

keys are depressed, it will be seen that I secure a certainty of action of the machine in correspondence with the notes played on the piano that is impossible in the case of those perforating machines which employ punches that after each hole made by the punch must be withdrawn, and hence, it is possible with the machine embodying my invention to produce a perforation, or slot, in faithful and accurate correspondence with the notes played on the operating instrument, no matter how fast the action thereof may be. With a machine of the punch type the slots are produced in reality by making a succession of holes by the action of the punches, whereas, in a machine embodying my invention the cut is a continuous operation because at all times while the playing instrument keys are depressed the blades of the cutters remain continuously in contact with the paper, the cut being produced by a shearing and not a punching action. A slotted bar or comb 200 supported parallel with the comb bar 20 firmly holds the cutters from lateral movement while permitting them to rock freely on their pivot rod.

Each cutter is normally and yieldingly held in an inactive position by a coil spring 22 which is connected at one end to a stem 23 on the cutter and at its other end is secured to one of the rods 15. For moving each cutter against the pull of its spring when it is desired to place the cutter blade in action, I provide for each cutter a lever 24 which is pivoted to one of the rods 15, there being, of course, a number of levers corresponding with the number of cutters, and said levers are spaced apart by washers or rings 25 on said rod 15. Each of the cutter-operating levers 24 is connected by instrumentalities not necessary to be described, with the appropriate key of the piano, or other operating instrument. Each lever 24 has a straight cam-like surface, or edge 26, which engages the edge of its cutter, which upon the rocking of the lever causes the swinging of the cutter to pass its blade through the paper and into a cooperating slot 19 in the comb bar 27, and the extended bearing which is thus provided between the lever and its cutter enables the cutter spring to maintain the lever in position in readiness for operation.

The action of a cutter is to produce a narrow strip of the width and length equal to the hole cut, which remains attached at one end to the sheet of paper, which strip enters the cutter slot 19. These narrow strips may be removed after the master sheet has been removed from the machine, but preferably I provide the machine with a cutting device for automatically severing them before the finished master sheet is removed

from the machine. This cutting device may be in the form of a rotary spiral cutter 28 which is mounted in an opening in the comb bar 27, and which is revolved by a suitable gear connection with the main driving shaft.

The feed of the paper from the roll, or spool 21 is produced by a pair of feed rollers 29 journaled in bearings in the end plates 10, one of these feed rollers being geared to the main driving shaft. The gearing between the main driving shaft, the feed rollers and the strip or wad cutter, is shown in Fig. 3 of the drawings and no specific description thereof is necessary for its arrangement will be readily understood by reference to the drawing.

To illustrate the capacity and speed of a machine embodying my invention, I may say that machines constructed as illustrated in the drawings have been operated with the speed of the main driving shaft of 1500 revolutions per minute.

It will be understood that until the piano, or instrument keys are operated, although the cutters are constantly in motion, they do not touch the paper, but only those cutters penetrate the paper and cut it that are selectively thrown into action by the operation of the piano keys.

Having thus described my invention what I claim is—

1. In a machine for perforating sheet material, a series of cutters past which the sheet to be perforated is fed, means for constantly moving said cutters to and fro, and means to selectively operate said cutters while being moved to and fro to place them in a position in advance of the point to which they are moved by said to and fro moving means.

2. In a machine for perforating sheet material, a series of cutters past which the sheet to be perforated is fed, each cutter having a blade, a slotted member to receive the blade, means for constantly moving said cutters to and fro, and means to selectively operate said cutters while being moved to and fro to place them in a position in advance of the point which they are moved by said to and fro moving means.

3. In a machine for perforating sheet material, the combination of a series of cutters, each having a pointed blade, a bar having a series of slots alining with said blades, a frame supporting the cutters, means for constantly vibrating said frame to move the blades to and from the slotted portion of the bar, and means for actuating each cutter separately to project its blade into an alining slot.

4. In a machine for perforating sheet material, the combination of a series of cutters having each a blade, a series of levers, one

for each cutter and engaging the same,
springs for holding the cutters yieldingly in
engagement with their respective levers, and
a vibratory frame supporting said cutters
5 and levers, and means to rock the levers to
move the cutters in the same direction in
which they move with the vibratory frame.

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

EDGAR W. MYERS.

Witnesses:

L. M. BACON,
B. P. SIMONS.

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