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P. ZINTZSCH.

MUSICAL INSTRUMENT.

No. 579,031. Patented Mar. 16, 1897.

Fig. 1.

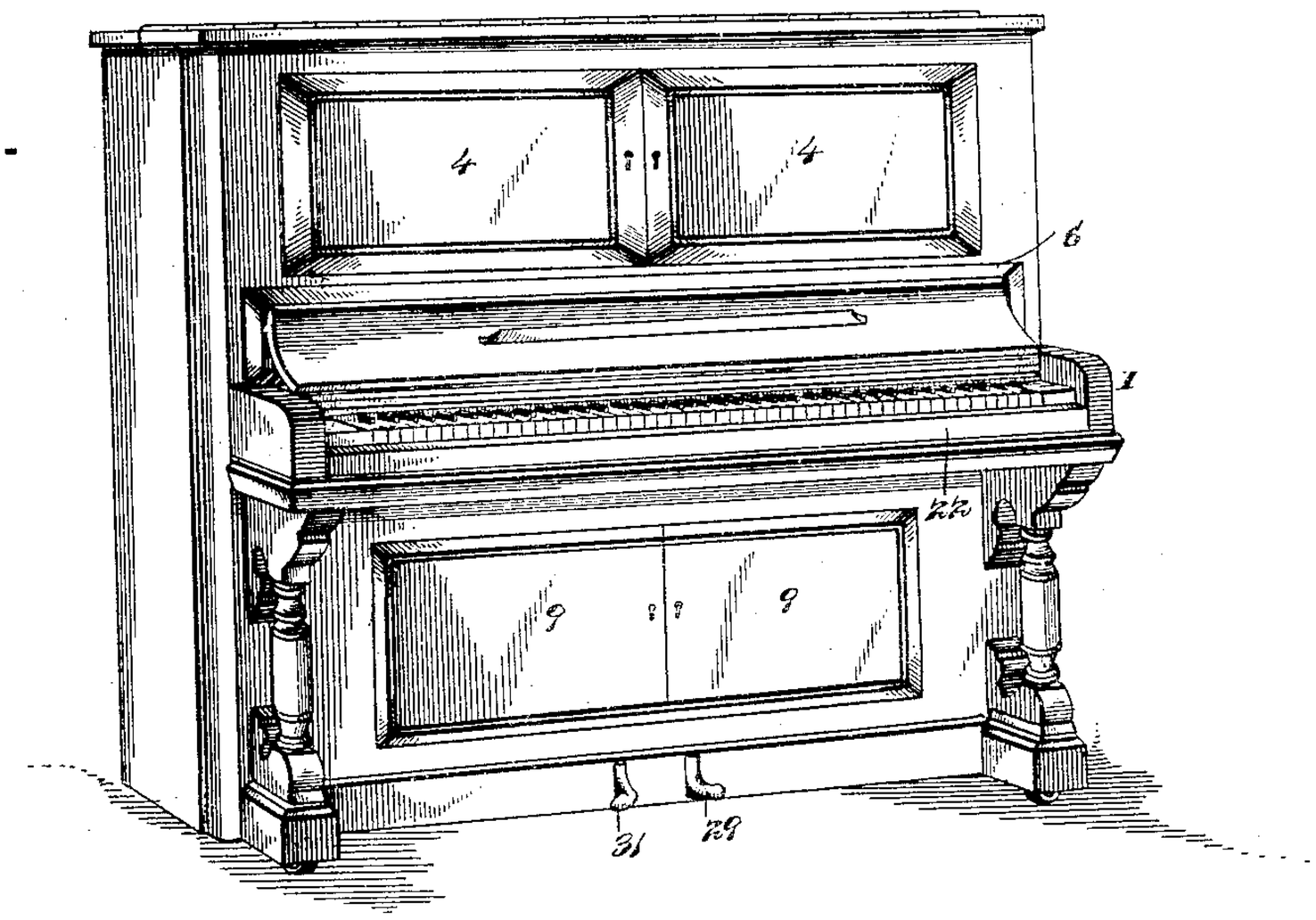

Fig. 2.

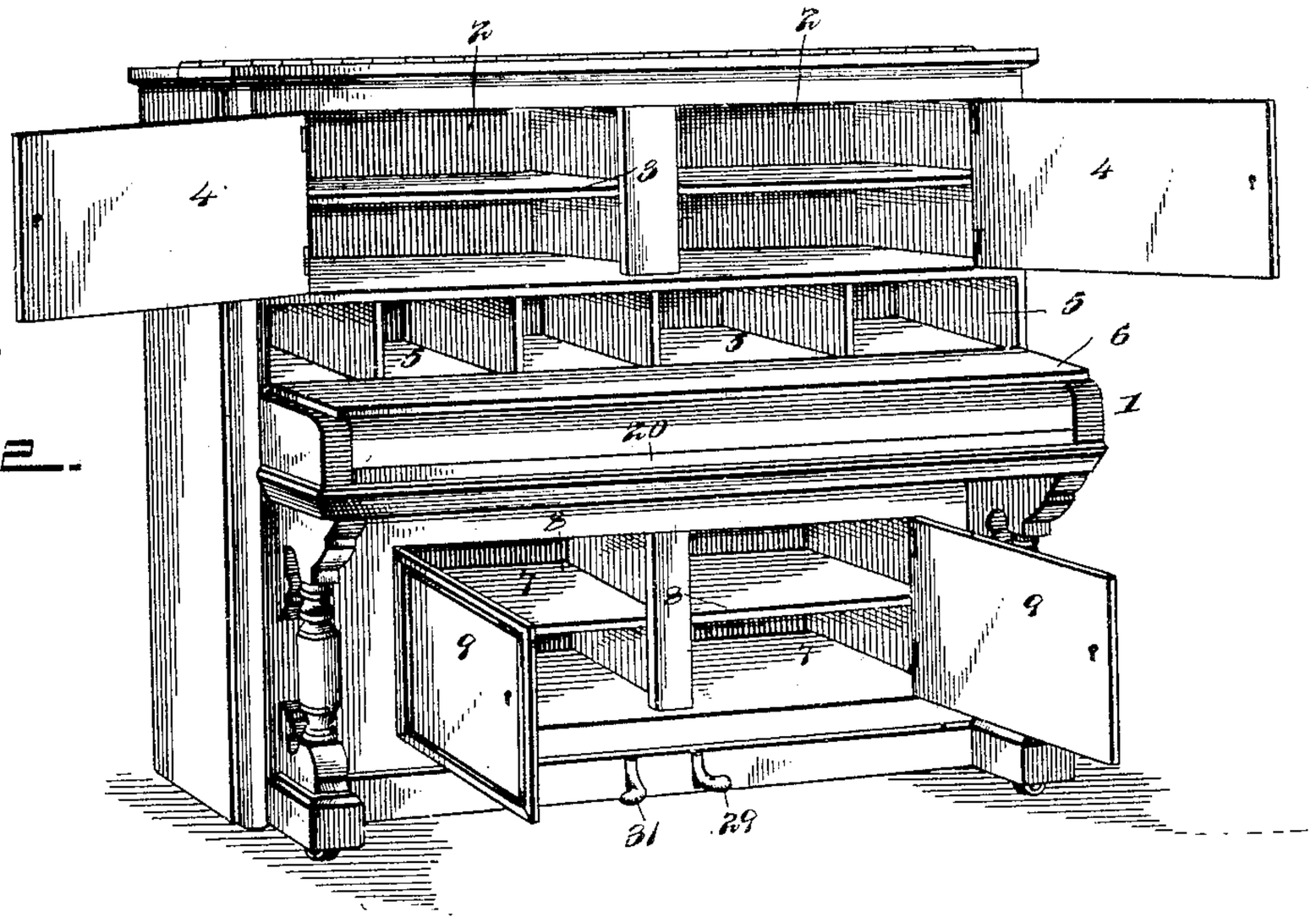

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Fig. 3.

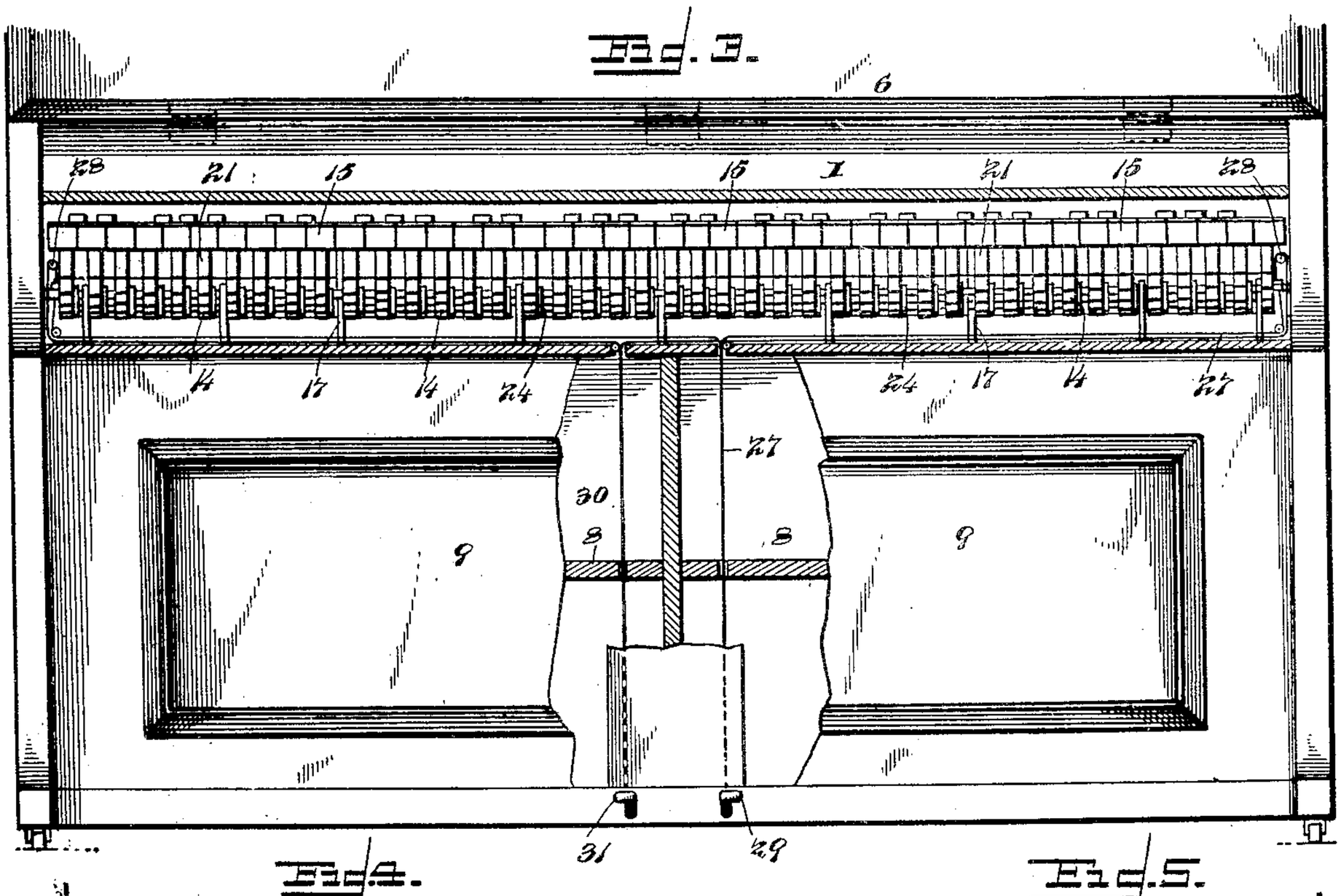


Fig. 4.

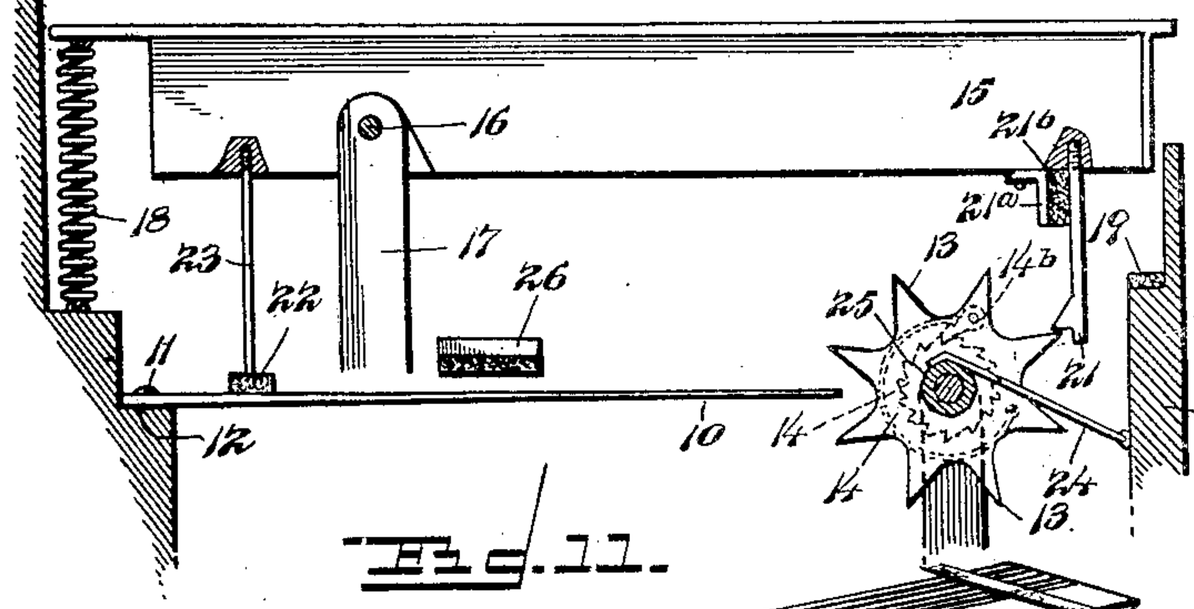
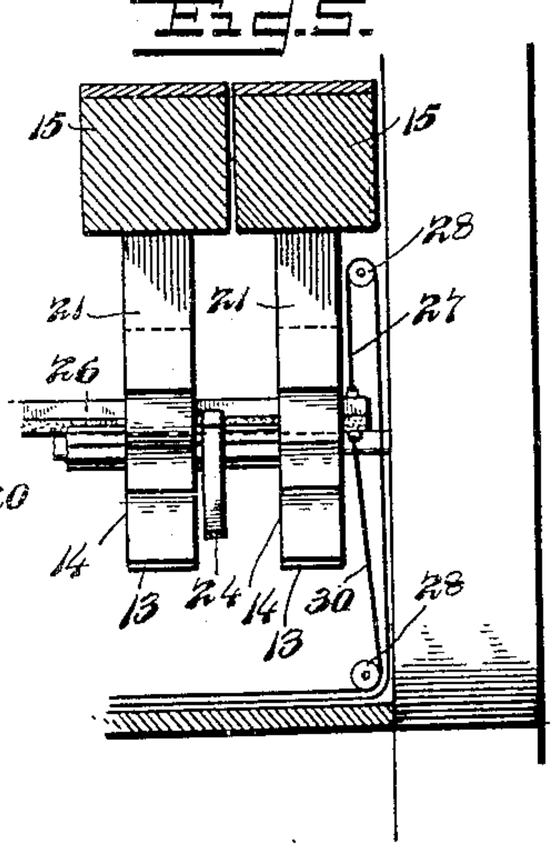


Fig. 11.

Fig. 5.



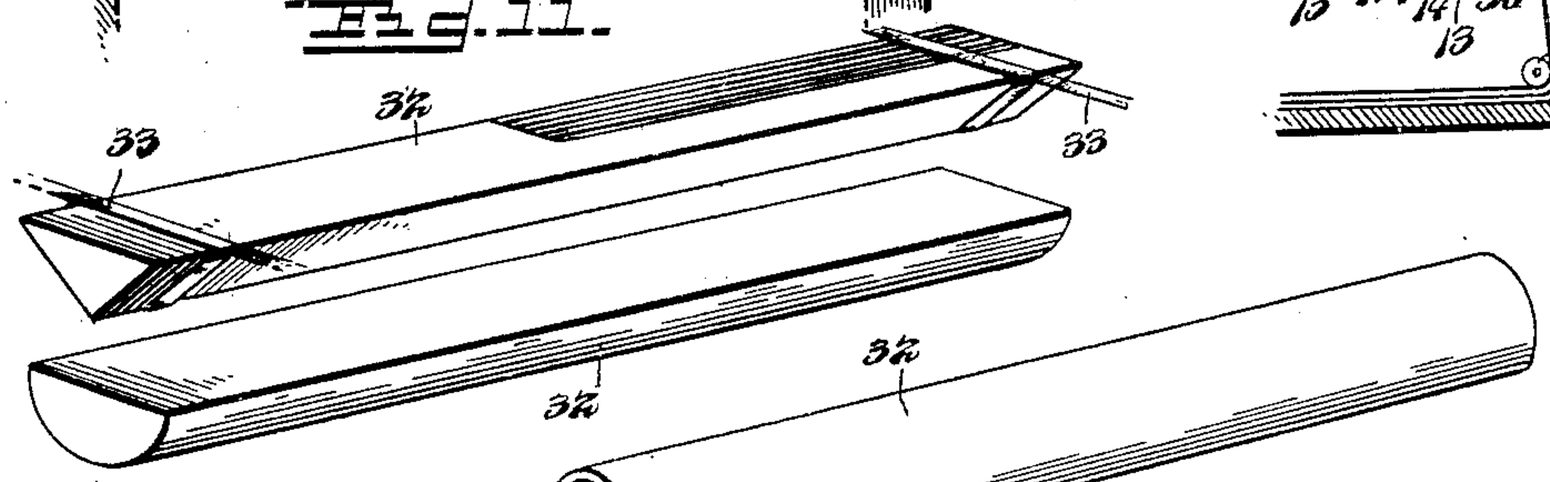


Fig. 12.

Fig. 10.

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P. ZINTZSCH.

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Fig. 10.

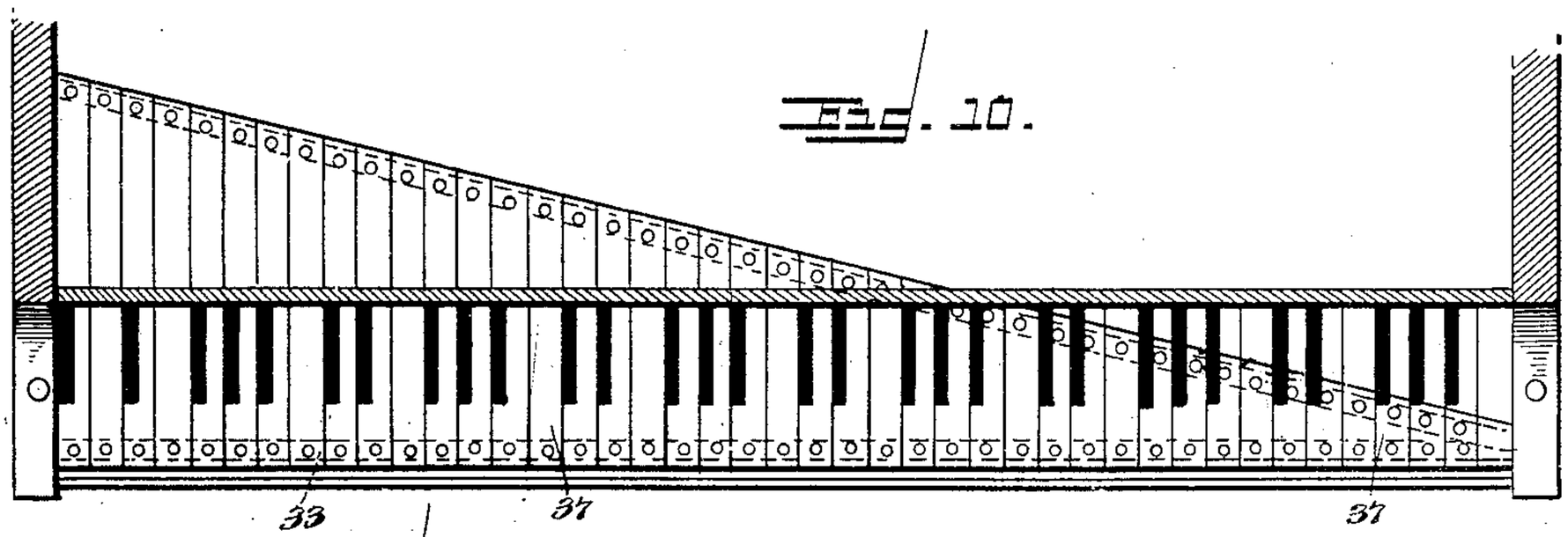


Fig. 8.

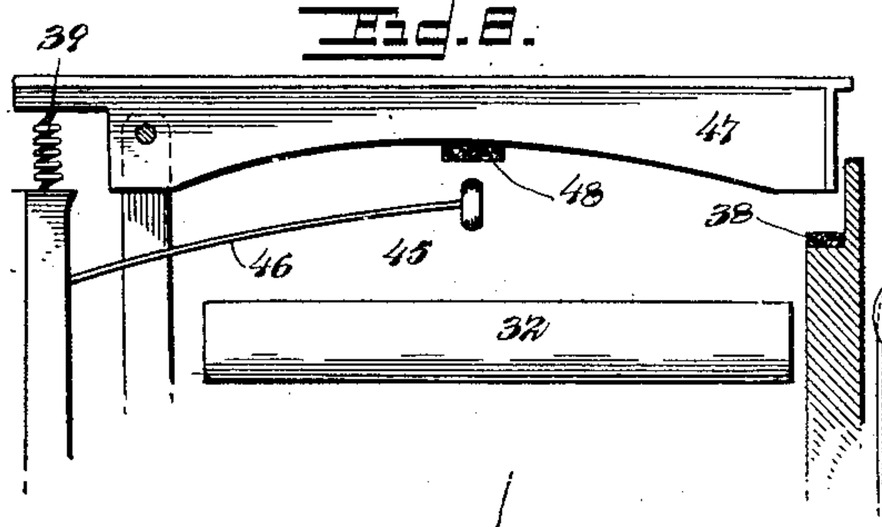


Fig. 9.

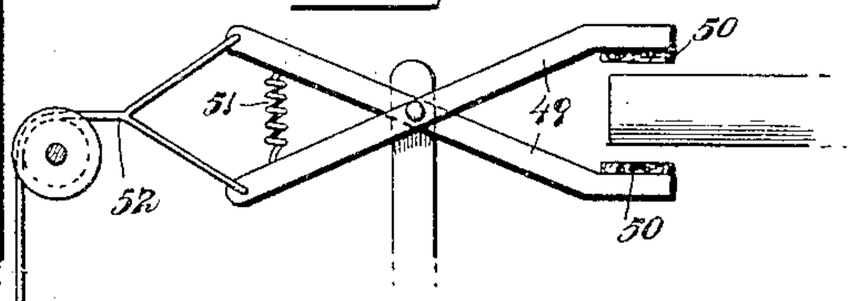


Fig. 6.

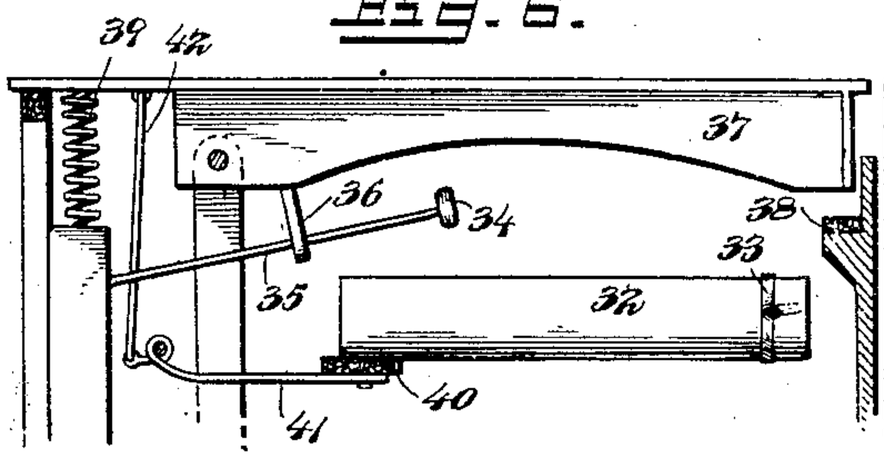


Fig. 7.

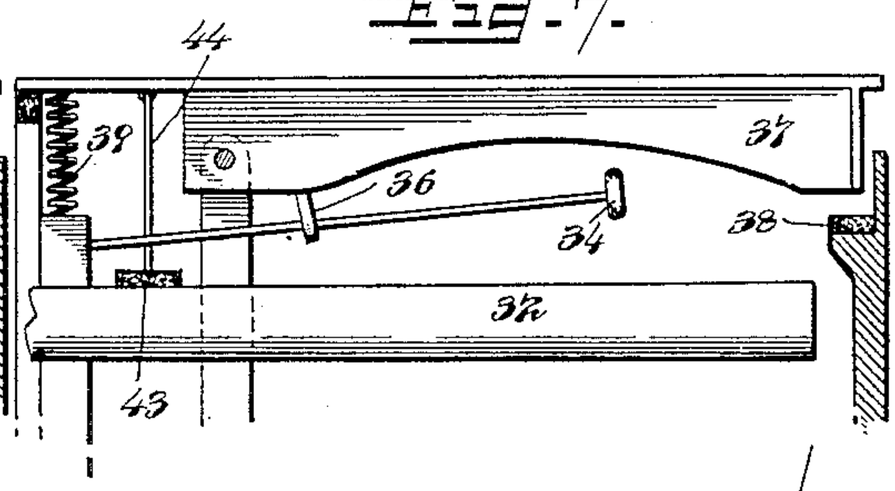


Fig. 14

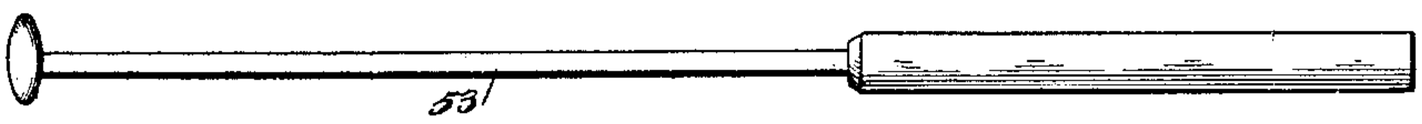
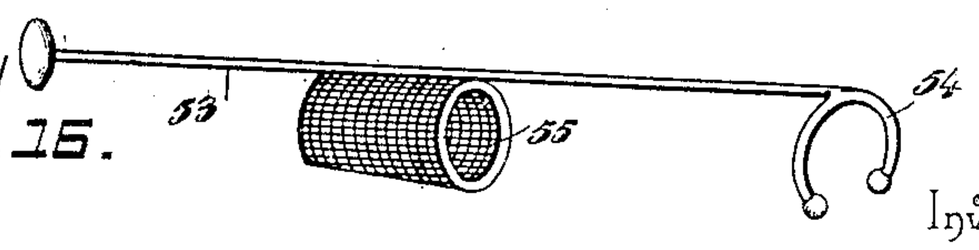


Fig. 15.

Fig. 16.



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UNITED STATES PATENT OFFICE.

PAUL ZINTZSCH, OF NEW YORK, N. Y.

MUSICAL INSTRUMENT.

SPECIFICATION forming part of Letters Patent No. 579,031, dated March 16, 1897.

Application filed April 15, 1896. Serial No. 587,665. (No model.)

To all whom it may concern:

Be it known that I, PAUL ZINTZSCH, formerly a subject of the Emperor of Germany, (having declared and proved my intention to become a citizen of the United States,) residing at New York, in the county of New York and State of New York, have invented a new and useful Musical Instrument, of which the following is a specification.

My invention relates to musical instruments, and particularly to a device adapted to be manipulated in a manner similar to that of an ordinary piano and having the general appearance thereof, the same being of more simple construction and being adapted for manufacture at a less cost, whereby it is brought within the reach of people of moderate means.

Further objects and advantages of this invention will appear in the following description, and the novel features thereof will be particularly pointed out in the appended claims.

In the drawings, Figure 1 is a perspective view of an instrument constructed in accordance with my invention, the keyboard being exposed for manipulation. Fig. 2 is a similar view showing the keyboard covered and the writing-desk extended, the doors of the cabinet being also shown open. Fig. 3 is a front view, partly broken away. Fig. 4 is a detail of one of the sound-producing devices, including a resonant bar, a sounder, and the operating-key. Fig. 5 is a detail front view, partly in section, of the same to show the connection of the means for operating the main damper. Fig. 6 is a view of a slightly-modified form of sound-producing device. Fig. 7 is another modified form of the same. Fig. 8 is still another modified form of the same. Fig. 9 is a detail view of a slightly-modified form of damper mechanism for use in connection with resonant bars which are adapted to be sounded by means of hammers. Fig. 10 is a plan view of a keyboard constructed of resonant bars and adapted to be operated by means of an auxiliary sounder. Figs. 11, 12, and 13 are detail views of resonant bars of different cross-sectional construction. Fig. 14 and 15 are respectively side and edge views of an auxiliary sounder adapted to be used in connection with the form of instrument shown in Fig. 10. Fig. 16 is an auxiliary sounder adapted to be used in connection with either of the forms of instrument illustrated, and particularly in connection with the form illustrated in Fig. 10.

Similar numerals of reference indicate corresponding parts in all the figures of the drawings.

The sound-producing features of the instrument embodying my invention are constructed and arranged to occupy a small space bounded approximately by the keyboard portion 1 of a case of the ordinary shape, whereby the remaining space in the case may be utilized for the purposes of a cabinet, as illustrated in Fig. 2. A portion of the interior of the case above the plane of the keyboard is constructed to form cupboards 2, having shelves 3 and doors 4, and below these cupboards is a compartment 5, of which the closure 6 forms a writing-desk when extended, as illustrated in Fig. 2, above the plane of the keyboard. In the same way the portion of the case below the plane of the keyboard is constructed to form cupboards 7, having shelves 8 and doors 9.

Various sound-producing devices may be used in connection with a cabinet constructed as above described; but the preferred form which is illustrated in Figs. 1 to 5, inclusive, embodies resonant bars 10, consisting of spring-tongues which are fixed at one end, as shown at 11, to a suitable shoulder 12 of the casing and are arranged at their free ends in the paths of arms or spurs 13 on a sounder 14, said sounder being rotatory and being adapted to receive motion from an operating-key 15. The key is pivoted at 16, the pivot being supported by a standard 17, and extends in rear of its pivotal point for attachment to a return-spring 18, and the downward movement of the front end of the key is limited by a padded stop-shoulder 19 on the front board 20 of the keyboard. This key is provided near its front end with a push-rod 21 to engage the spurs or arms of the sounder successively, and carried by the rear end of the key is a key-damper 22, supported by means of a rod 23. A friction-brake 24 is secured to the front board 20 and is arranged in contact with the hub 25 of the sounder to prevent ro-

tation of the latter after the downward movement of the key has ceased.

In connection with the above-described form of sound-producing mechanism I employ a main damper-bar 26, which extends continuously from one end of the series of resonant bars to the other and is supported at its extremities by means of cords or flexible connections 27, which extend around direction-pulleys 28 and are connected to a foot-pedal 29. In order to return the damper-bar to its position in contact with the resonant bars, I employ a cord or flexible connection 30, which extends to and is attached to a foot-pedal 31. The function of this common damper-bar, which spans a plurality of resonant bars, is to deaden the sound of the resonant bars or allow the same to vibrate freely, as may be required by the character of the music being performed.

In Fig. 6 I have shown a modified form of sound-producing mechanism in which the resonant bar 32 is supported near its extremities by means of cords 33 or their equivalents, and the sounders consist of hammers 34, of which the shanks 35 are of spring-wire, and are connected by means of push-bars 36 with the keys 37. When a key is depressed and checked by the padded stop-shoulder 38, the flexibility of the shank 35 allows the head of the hammer to continue until it strikes the surface of the resonant bar. This key is provided with a return-spring 39, and in connection therewith I preferably employ a key-damper consisting of a pad 40, carried by a pivotal arm or lever 41, which is connected with the key by means of a link 42.

In Fig. 7 I have shown another slightly-modified form of sound-producing mechanism in which the resonant bar 32, sounder 34, push-bar 36, key 37, and return-spring 39 are similar to those described in connection with Fig. 6, the damper, however, consisting of a pad 43, which is connected directly by means of a rod 44 with the rear extremity of the key.

In Fig. 8 I have shown still another modified form of sound-producing mechanism in which the resonant bar 32 is caused to vibrate by means of a hammer 45, having a spring-wire shank 46 attached to the frame, motion being imparted to the hammer directly by the key 47, which carries a pad 48 to strike the head of the hammer.

It will be seen that in all of these forms of sound-producing mechanisms the resonant bars are arranged directly beneath and in the planes of the keys by which they are manipulated, and in the same way the sounders for said resonant bars are disposed beneath and in the planes of the keys, whereby the entire space within the case in rear and above and below the keyboard is unoccupied.

In Fig. 9 I have shown a form of damper adapted for use in connection with resonant bars, such as I have illustrated in Figs. 6, 7, and 8, the same consisting of levers 49, carrying pads 50 and normally held separated by means of a spring 51. These levers are drawn together at their padded extremities against the tension of the spring 51, and hence into contact with the resonant bars by means of an operating-cord 52.

In Fig. 10 I have shown a form of sound-producing device in which the resonant bars are exposed, as in a xylophone, and in connection therewith I may employ sounders such as that illustrated in Figs. 14 and 15, which is of the ordinary construction, or such as that illustrated in Fig. 16, which is provided with a spring-metal shank 53, terminating at one end in a ring 54 to encircle the finger of the operator and a thimble 55 to engage the extremity of the finger. This form of striker may also be employed in connection with the sounding mechanism embodying keys, as in Figs. 4, 6, 7, and 8, in order to give greater elasticity to the touch of the performer.

In Figs. 11, 12, and 13 I have illustrated different forms of resonant bars adapted to be substituted for those illustrated in Figs. 6, 7, and 8.

It is desirable in connection with the above-described preferred form of my invention to provide means for positively preventing the sounder from moving through a greater number of degrees than necessary in order to actuate the resonant bar, and hence in the drawings I have illustrated the hubs of the sounders as of cross-sectionally angular construction and have provided the brakes 24 with angular extremities to engage the angles of said hubs successively. In this connection I also employ means for preventing backward rotation of the sounder by reason of the frictional contact therewith of the push-rod 21, said means preferably consisting of fixed ratchets 14^a, engaged by spring-actuated pawls 14^b, carried by the sounders 14.

It will be understood that while in Figs. 6, 7, and 8 I have shown springs for returning the keys to their normal positions weights may be substituted therefor, if preferred.

The resilient or yielding push-bar 21 is arranged contiguous to a stop-bracket 21^a, provided with a pad or cushion 21^b, to prevent rattling during operation.

The compactness with which the sounding mechanism is arranged, due to the horizontal disposition of the sounding-bars and their arrangement respectively under and parallel with the keys, and the specific arrangement of the key-dampers and continuous damper-bar adapt the operating parts of the device, with the exception of the foot-pedals and connections, to be arranged in the horizontal keyboard-frame, which is arranged at an intermediate part of the casing of the instrument, whereby the remainder of the interior of the casing is free for the other uses hereinbefore mentioned.

Various changes in the form, proportion, and the minor details of construction may be

resorted to without departing from the spirit or sacrificing any of the advantages of this invention.

Having described my invention, what I claim is—

1. A musical instrument having a casing provided with an intermediate horizontal keyboard-frame, depressible keys yieldingly supported in their normal positions and pivotally mounted upon suitable supports, terminally-supported sounding-bars arranged horizontally below the plane of the keys and respectively in the vertical planes thereof, sounders connected with the keys and arranged respectively in operative relation with the sounding-bars, key-dampers supported respectively by the keys and normally held in contact with the respective sounding-bars near their rear ends, a continuous horizontal damper-bar arranged above the plane of the sounding-bars and in a position transverse thereto at an intermediate point, foot-pedals, and connections between the foot-pedals and said damper-bar, whereby the latter may be moved either toward or from the plane of the sounding-bars, substantially as specified.

2. A musical instrument having resonant bars, spring-returned keys, spurred rotary sounders operatively connected with the keys and provided with cross-sectionally-angular hubs, and brakes having angular extremities to engage the angles of the said hubs, substantially as specified.

3. A musical instrument having resonant bars, resilient keys, spurred rotary sounders, yielding push-bars depending from the keys to engage the arms of the sounders, stop-brackets arranged in the paths of the push-bars, and an interposed cushion, substantially as specified.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

PAUL ZINTZSCH.

Witnesses:
GOTTLIEB MAIER,
JACOB GRAPMANN.