

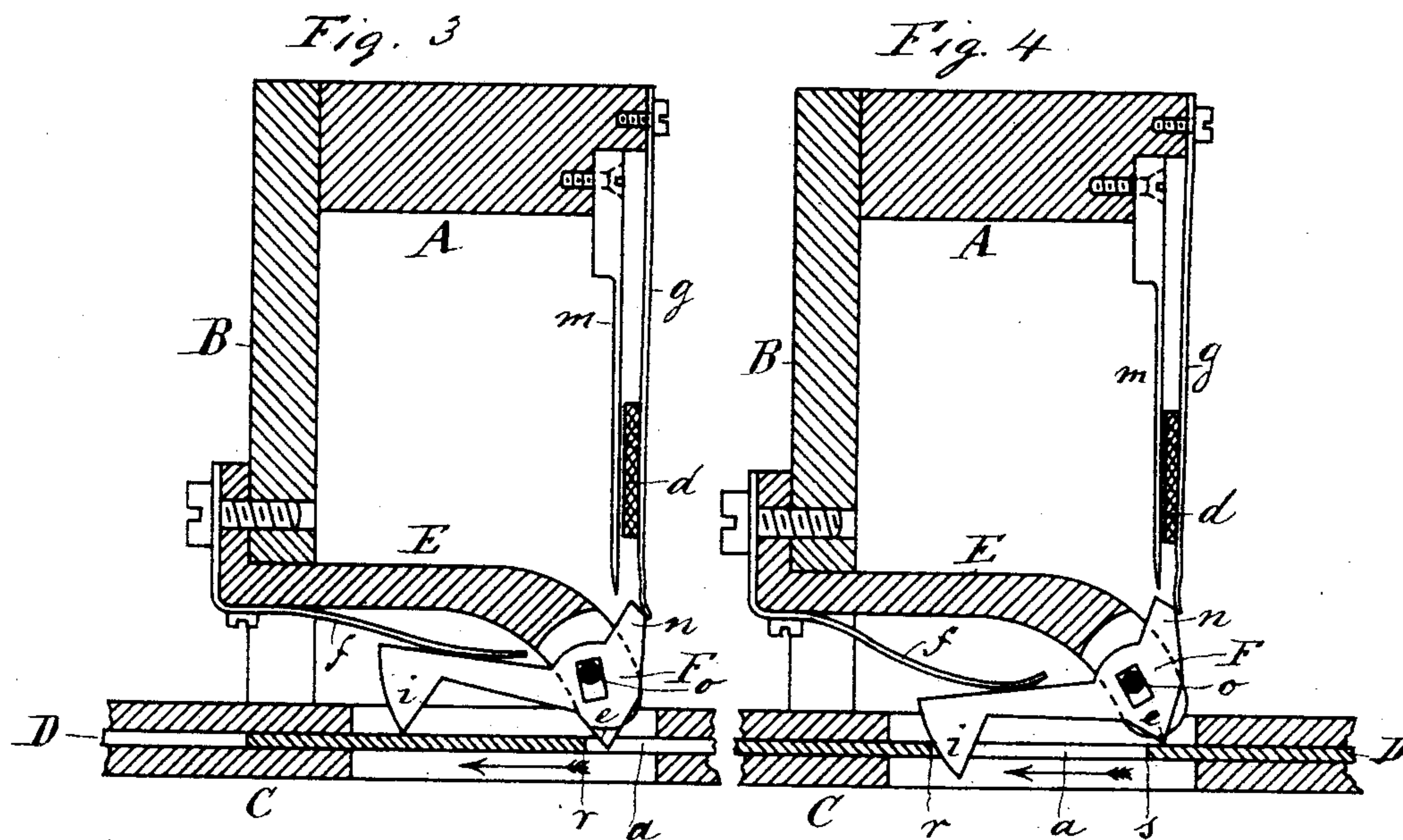
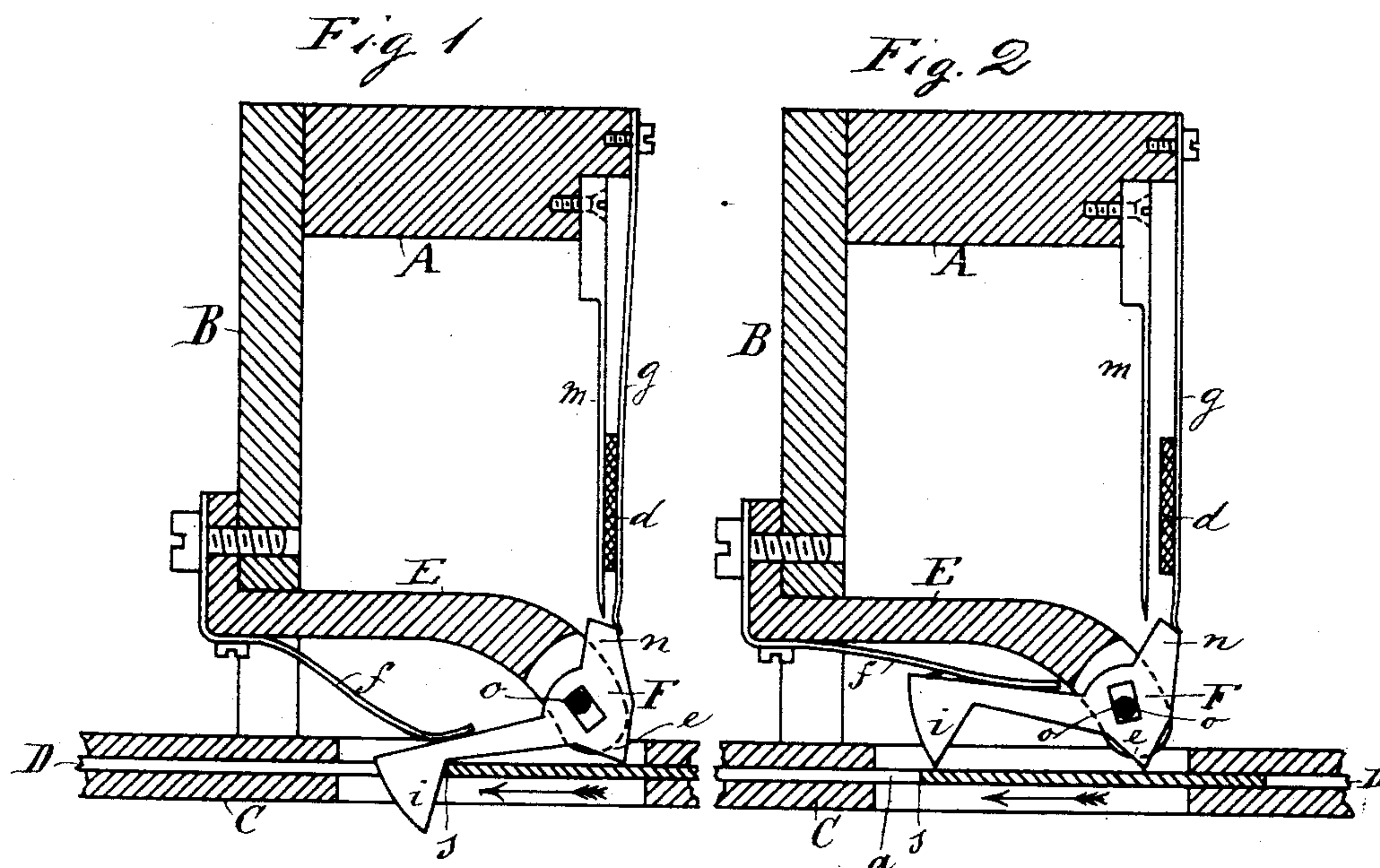
(No Model.)

2 Sheets—Sheet 1.

J. SOHÜNEMANN.
MUSIC BOX.

No. 445,093.

Patented Jan. 20, 1891.



Witnesses.
Arthur Lutz
Otto Lueckert

Inventor
Johann Schünemann
By Wm B Lotz
his attorney

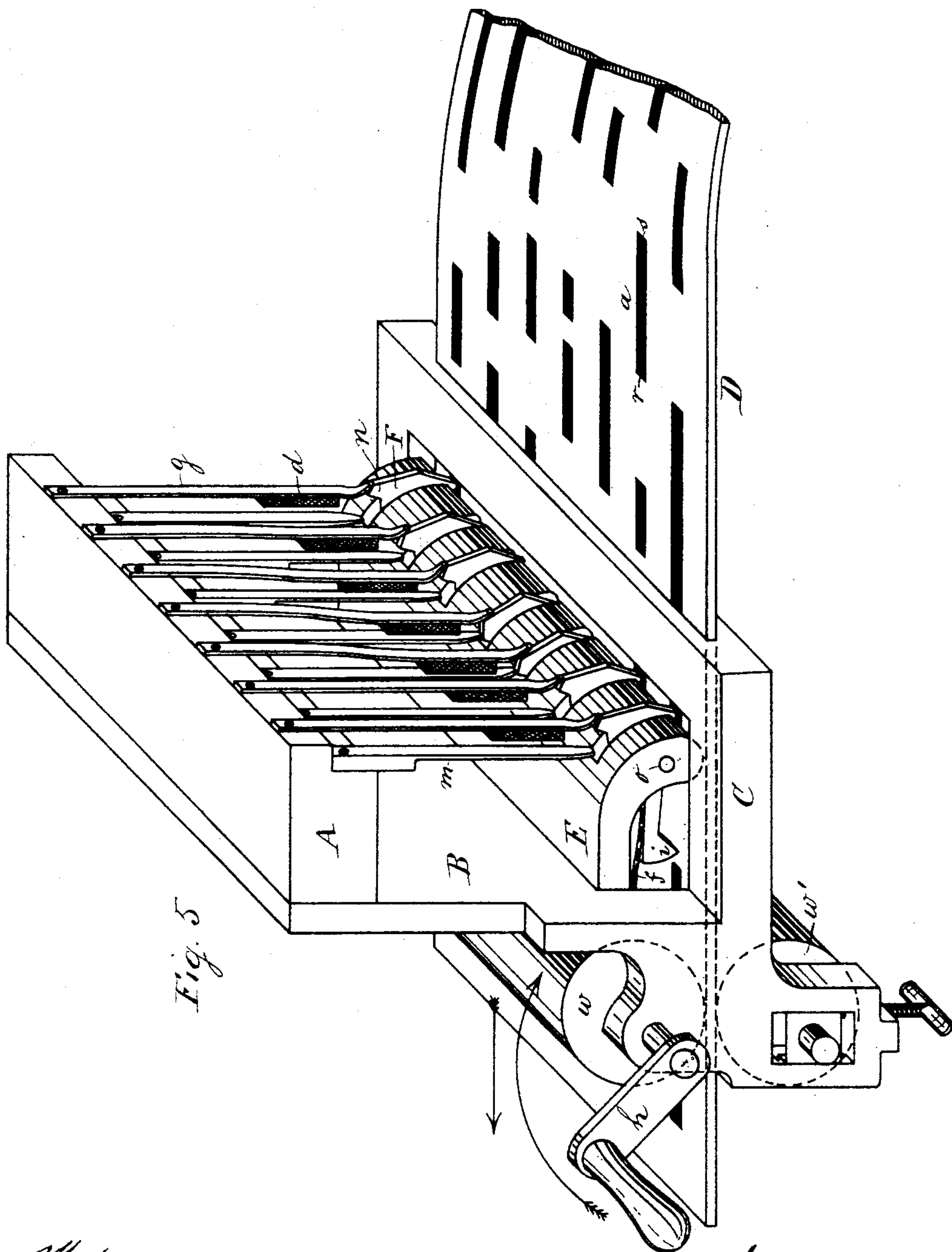
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2 Sheets—Sheet 2.

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UNITED STATES PATENT OFFICE.

JOHANN SOHÜNEMANN, OF BERLIN, GERMANY.

MUSIC-BOX.

SPECIFICATION forming part of Letters Patent No. 445,093, dated January 20, 1891.

Application filed April 12, 1890. Serial No. 347,582. (No model.)

To all whom it may concern:

Be it known that I, JOHANN SOHÜNEMANN, a subject of the German Emperor, residing at Berlin, in the Kingdom of Prussia and Empire of Germany, have invented certain new and useful Improvements in Music-Boxes, of which the following is a specification, reference being had therein to the accompanying drawings.

10 This invention relates to music-boxes in which a row of metal tongues, by vibration, bring forth the musical tones. These metal tongues heretofore were thus vibrated by being tripped by pins or teeth of a rotating barrel; and it is the object of this my invention
15 to provide a music-box in which the metal tongues are operated by means of a perforated sheet of paper; and with this object in view my invention consists of the novel devices
20 and combinations of devices hereinafter described and specifically claimed.

In the accompanying drawings, Figures 1, 2, 3, and 4 are cross-sections showing one of the tongue-tripping keys on its several positions during its operation, and Fig. 5 is a perspective view of a series of tongues and operating-keys with the perforated sheet and feeding mechanism for the same.

Corresponding letters of reference in the
30 several figures of the drawings designate like parts.

A series of metal tongues *m* are secured against the rabbeted edge of a strip *A*, secured with its opposite edge against a vertical plate *B*, fixed upon a horizontal plate *C*,
35 slotted longitudinally to provide a guideway for the paper ribbon *D*, moving therein in the direction indicated by an arrow. To the ends of plate *B*, to extend rearward, are formed
40 the journal-boxes for two rollers *w* and *w'*, the lower journal-box being vertically adjustable, and between these rollers *w* and *w'* the paper strip *D* will move with a sufficient compression to provide enough friction that with
45 turning the upper roller *w* by its hand-crank *h* the paper strip *D* will be pulled rearwardly through the slotted guide-plate *C*. Against the forward upper edge of strip *A* are also secured the upper ends of leaf-springs *g*, one
50 for each tongue *m*, to be in front thereof,

and each having secured a pad *d*, of felt or other suitable material, to act as dampers to tongues *m*.

Through an opening in the lower portion of plate *B* is placed the rear end of a metal piece
55 *E*, being secured with its rear vertical flange against the rear face of plate *B*, to be rigid therewith. The forward end of this piece *E* is curved downward, and provides a longitudinal eye for a pin *o*. This forward end is
60 slotted for providing guides for the pivotal parts of a series of keys *F*, the pivot-eyes for the pin *o* of each such key *F* being oblong on a nearly vertical direction. Below this pivot
65 each key *F* has a V-shaped heel *e*, and the rearwardly-extending arm of each key has to its end also a downwardly-pointed V-shaped
70 toe *i*, being somewhat segmental or curved on its rear edge. To the pivotal part of each key is also provided an upwardly-extending
75 nose *n*, the upper end of which is made slanting forwardly, so its rear upper edge will present an acute angle or sharp corner. A leaf-spring *f* for each key is secured under
80 the rear end of piece *E* to press upon the rearward arm of key *F* a little forward of toe *i*. The strip of paper *D* is perforated with
85 longitudinally-oblong holes in rows on parallel lines, one line for each key *F*, these holes *a* being punched on intermittent proper positions for the several tongues *m* to be tripped,
90 and of a length in proper proportion for the length of time the particular tongue *m* is to be allowed a vibration for sounding the particular tone. The advancing end of each
95 such perforation *a* is marked *r*, and its opposite end is marked *s*. The longitudinally-slotted plate *C* is again vertically slotted to provide openings of proper size, one for each
100 key *F* to play up and down in.

During the movement of a key *F* the nose *n* must follow the line of a rectangular figure in a manner that after tripping the lower end of a tongue *m* it must during its return movement clear such tongue, and must then be
95 lifted for the next tripping operation. This movement must be imparted to such tongue by one of the perforations *a* of the paper ribbon *D*, that is to be moved through the instrument with a uniform speed in the di- 100

rection indicated by the arrow, which several movements of the key F are clearly shown by Figs. 1, 2, 3, and 4 of the drawings.

In Fig. 1 the key F is shown in position with its heel *e* resting upon the solid portion of the paper ribbon D, while its toe *i* is in one of the perforations *a*, to be lifted as the paper ribbon advances by the edge *s* of such perforation coming into contact with the angular face of such toe *i*, whereby the nose *n* will be swung into contact with the tongue *m*, tripping the same.

Fig. 2 shows the position of key F with the pedal and toe *i* resting upon the solid portion of the paper strip. Fig. 3 shows the position with the end edge *r* of one of the perforations *a* of the paper strip just passed from under the heel *e* of the key F, allowing the same to enter such perforation, whereby the nose *n* will drop to be below the lower end of the tongue *m*, ready to be swung toward the rear without touching the end of such tongue *m*; and Fig. 4 shows the position of the heel *e*, having been lifted, while the toe *i* just enters a perforation, whereby the nose *n* is swung rearward from under the tongue *m* and into position for the next trip movement taking place, with the ends of perforation *a* reaching and lifting toe *i* again, as shown by Fig. 1.

It will be readily seen the oblong eye of key F will provide for a vertical movement of such key independent of the swinging movement, thereby permitting a return movement of nose *n* without touching tongue *m*, and the dropping of toe *i* into the perforation *a* of paper ribbon D will be by degrees, because the segmental end edge of such toe not being concentric with pin *o*, but on a curve with increasing radius, this segmental edge sliding down on end *r* of perforation *a* must drop slowly.

Shortly before dropping the tongue *m* this tongue must be perfectly motionless, since otherwise a rattling noise would be caused by the vibrating tongue *m* touching the approaching nose *n*, and for the purpose of causing the tongue *m* to be perfectly motionless

the springs *g*, with pads *d*, are provided. The lower end of such a spring *g* rests upon the nose *n*, and is in constant contact therewith, and with the movement of such nose *n* this spring *g* is more or less pushed away from tongue *m*, excepting at the time such nose is swung to its most rearward position, (shown by Fig. 1,) when the pad *d* will be allowed to press against tongue *m*, releasing the same again instantaneously with the forward movement of the nose *n* for tripping the tongue *m* and causing it to vibrate.

What I claim is—

1. The combination, with a paper ribbon having longitudinally-rectangular perforations and being guided in a slotted plate and moved by suitable rollers, of vibratable tongues, and of keys, one for each tongue, each key having an oblong eye pivoted upon a round pin and provided with a V-shaped heel and an arm with a V-shaped toe, both engaging the perforations of the paper ribbon, and with a nose for tripping the tongue to vibrate, all substantially as set forth, to operate as specified.

2. The combination, with a paper ribbon having longitudinally-rectangular perforations and being guided in a slotted plate and moved by suitable rollers, with vibratable tongues, and with keys, one for each tongue, each key having an oblong eye pivoted upon a round pin and provided with a V-shaped heel and an arm with a V-shaped toe, both engaging the perforations of the paper ribbon, and with a nose for tripping the tongue to vibrate, of springs with pads as dampers for the tongues operated by the noses of the keys simultaneously with the tripping movement thereof, all substantially as set forth, to operate as specified.

In testimony whereof I affix my signature in presence of two witnesses.

JOHANN SOHÜNEMANN.

Witnesses:

ULRICH R. MAERZ,
JULIUS STUCKENBERG.