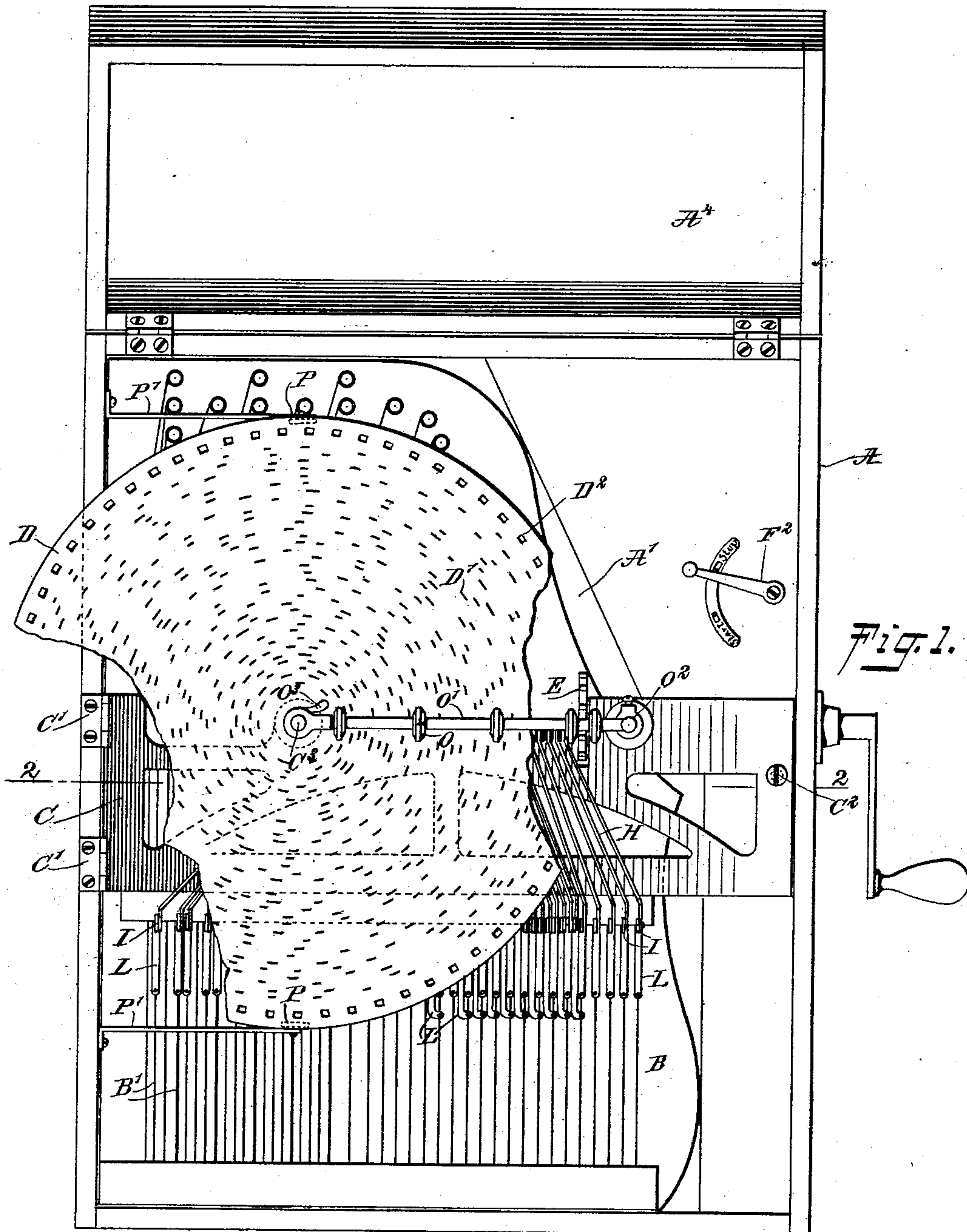


J. KRUFF.
SELF PLAYING MUSICAL INSTRUMENT.

(Application filed Nov. 22, 1901.)

(No Model.)

2 Sheets—Sheet 1.



WITNESSES:

William P. Goebel.
Geo. J. Hostetler.

INVENTOR

John Kruff

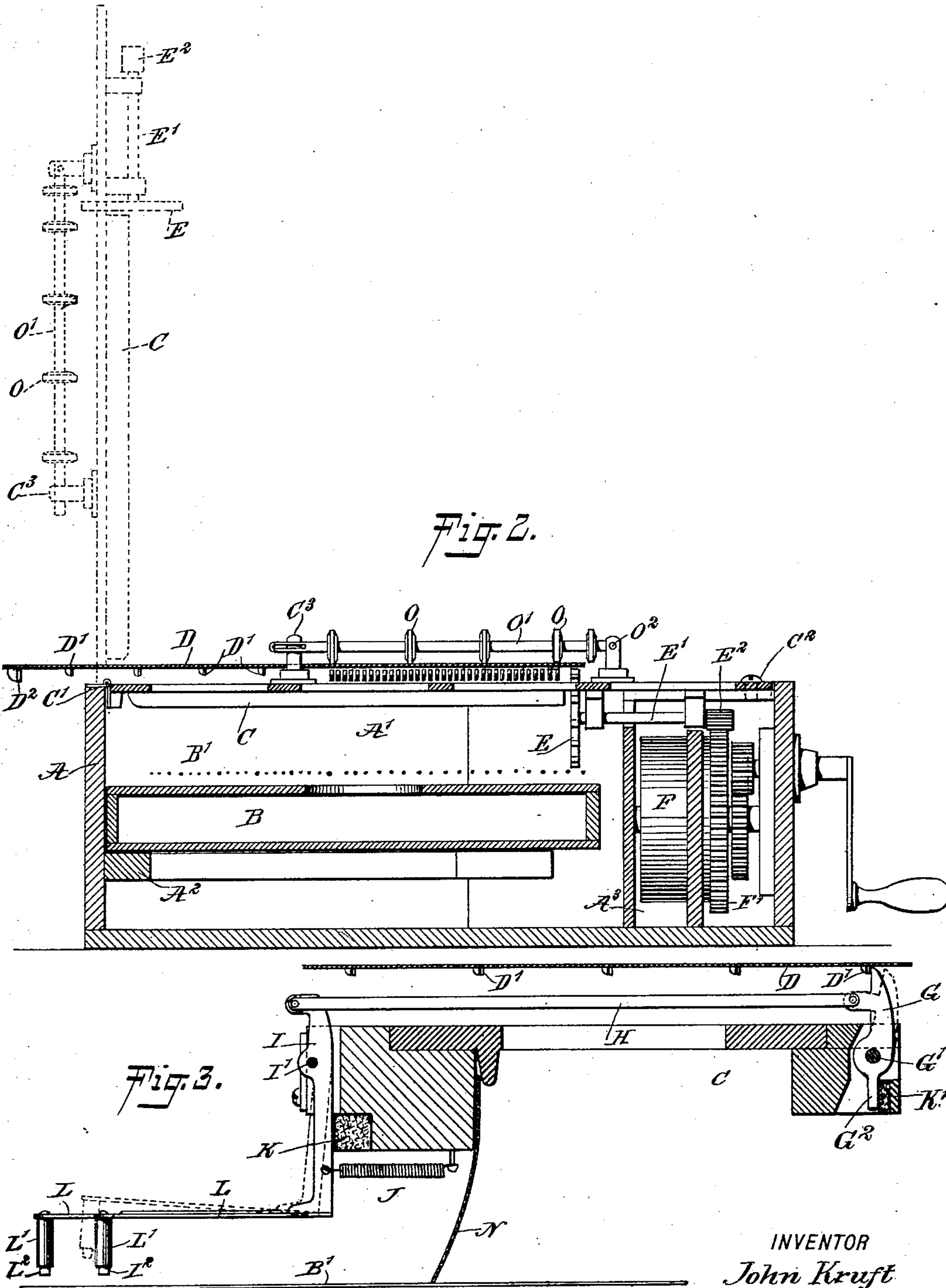
BY *Mumford*
ATTORNEYS

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WITNESSES:
William P. Goebel,
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UNITED STATES PATENT OFFICE.

JOHN KRUFFT, OF JERSEY CITY, NEW JERSEY, ASSIGNOR TO OSCAR SCHMIDT, OF JERSEY CITY, NEW JERSEY.

SELF-PLAYING MUSICAL INSTRUMENT.

SPECIFICATION forming part of Letters Patent No. 715,089, dated December 2, 1902.

Application filed November 22, 1901. Serial No. 83,299. (No model.)

To all whom it may concern:

Be it known that I, JOHN KRUFFT, a citizen of the United States, and a resident of Jersey City, in the county of Hudson and State of New Jersey, have invented a new and Improved Self-Playing Musical Instrument, of which the following is a full, clear, and exact description.

The invention relates to musical instruments having strings stretched over a sounding-board and struck by hammers controlled by a moving note-sheet to produce the desired music.

The object of the invention is to provide a new and improved self-playing musical instrument of the guitar-zither type and which is very simple and durable in construction, not liable to get out of order, and arranged to cause the hammers to strike the strings with a recoil action to insure softness and sweetness of tone, the construction permitting convenient removal of the guitar-zither to permit of playing it by hand whenever it is desired to do so.

The invention consists of novel features and parts and combinations of the same, as will be fully described hereinafter and then pointed out in the claims.

A practical embodiment of my invention is represented in the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a plan view of the improvement with parts broken out. Fig. 2 is a transverse section of the same on the line 2 2 of Fig. 1, and Fig. 3 is an enlarged longitudinal sectional elevation of the hammer-action.

The improved musical instrument is mounted in a casing A, formed with a chamber A', corresponding in outline approximately to the outline of a guitar-zither B or like musical instrument of any approved construction, said guitar-zither B being supported on cleats A², arranged in such a manner within the chamber A' that the guitar-zither B is supported above the bottom of the casing A and below the top thereof, as is plainly indicated in Fig. 2. The strings B' of the guitar-zither B are adapted to be sounded by the

hammers of a hammer-action mounted on a base-plate C, extending transversely over the chamber A', one end of the base-plate being connected by hinges C' to one side of the casing A, and the free end of said base-plate being adapted to be fastened to the casing by a screw C², so as to hold the base-plate C and the action thereon in proper position relative to the strings B' of the guitar-zither B. When the screw C² is removed, the base-plate C, with the hammer-action thereon, can be swung upward into the position shown in dotted lines in Fig. 2 to permit of removing the guitar-zither B from the casing to allow of playing the guitar-zither by hand in the usual manner. When the guitar-zither, however, is in position in the chamber A', then the base-plate C is held in a fixed position by the screw C², screwing into the casing. The hammer-action is actuated by a note-sheet D, preferably of sheet metal in disk form and mounted to turn on a post C³, forming part of the bed-plate C. The note-sheet D is provided on its under side with note projections D' for actuating the hammers, as hereinafter more fully described, and on said note-sheet D are arranged equally-spaced driving projections D², arranged in a circle and spaced equidistant apart and adapted to be engaged by the teeth of a toothed wheel E, secured on a shaft E', journaled in suitable bearings carried by the bed-plate C. On the shaft E' is secured a pinion E² in mesh with a gear-wheel F' of the spring or other motor F', held in a chamber A³, separate from but adjacent to the chamber A'. (See Fig. 2.) Now when the motor F' is started the gear-wheel F' is rotated and drives the pinion E², the shaft E', and the toothed wheel E, so that the latter by engaging the driving projections D² imparts a rotary motion to the note-sheet D.

The hammer-action is arranged as follows: On the bed-plate C are arranged arms G, located one alongside of the other and all fulcrumed on the shaft G', held radially on the bed-plate C, each arm being adapted to be engaged at its upper free end by a note projection D' of the note-sheet D. (See Fig. 3.) Each of the arms G is pivotally connected between its fulcrum and its free end by a link

H with the upper end of a lever I, fulcrumed at I' on the bed-plate C, and each lever I is pressed on by a spring J to hold the lever I normally against the felted stop-rail K and the tailpiece G² of the arm G against a felted rail K', both rails K and K' being secured to the bed-plate C. On the lower end of each arm I is secured or formed a horizontally-extending spring-handle L, arranged in alignment with a corresponding string B' and carrying at its free end a socket L', containing a hammer L², preferably made of wood. Each of the hammer-heads L² stands normally above a corresponding string B', and when a note projection D' moves in engagement with the free end of an arm G then the latter is swung to one side (see dotted lines in Fig. 3) to cause the corresponding link H to impart a swinging motion to the lever I, so as to swing the hammer-handle L, its socket L', and head L² upward against the tension of the spring J. As soon as the note projection D' moves out of contact with the free end of the arm G the corresponding arm I is caused to swing against the stop-rail K by the action of the spring J, and the lever I, abutting against said stop-rail, causes the arm L to swing downward, so that the hammer-head L² moves into striking contact with the corresponding string to sound the same and immediately returns to its former position, owing to the resiliency of the spring-handle L.

On the bed-plate C are held dampers N, preferably in the form of strips of a fabric material engaging some of the strings B' of the guitar-zither, preferably only the heavy bass-strings, so as to damp the same.

The note-sheet D is held in proper position for the projections D² to be engaged by the toothed wheel E and for the projections to engage the arms G by the use of the rollers O, mounted to rotate loosely on a rod O', fulcrumed at O² on the bed-plate C and adapted to be locked to the post C³ by a suitable catch O³, as indicated in Fig. 1. By unlocking the rod O' and swinging the same upward the note-sheet D can be readily placed in position on the post C³ or removed therefrom. The sides of the note-sheet D are supported on rollers P, held on the arms P', attached to one side of the casing, as is plainly shown in Fig. 1. The casing is provided with a suitable cover A⁴ to protect the instrument against dust. A suitable starting and stopping device F² is provided for the motor. (See Fig. 1.)

The note projections D' and the driving projections D² are preferably of the construction shown and described in the Letters Patent of the United States No. 674,208, granted to me on May 14, 1901, said driving projections being preferably, however, considerably larger than the note projections to insure proper driving of the note-sheet by the wheel E. By having the arms G arranged one alongside of the other radially with relation to the note-sheet it is evident that the projections D'

squarely engage the free ends of the arms G, so as to properly actuate the same for swinging the hammers upward and then releasing the same for the hammers to strike the strings.

As indicated in Fig. 1, the links H are arranged in fan shape to allow of swinging the levers I and hammers in proper relation to the strings without spreading the arms G apart, and thereby requiring larger note-sheets.

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

1. A self-playing musical instrument, comprising a casing having a chamber for a guitar-zither, the chamber having an outline corresponding to that of the guitar-zither, supports in the chamber to support the guitar-zither above the bottom and below the top of the chamber, a hammer-action for sounding the strings of the guitar-zither, the hammer standing lengthwise of the strings and above the latter, a base-plate carrying the hammer-action and normally held in a fixed position on the casing over the guitar-zither, said base-plate being arranged to swing, and with it the hammer-action, to move the latter out of the way of the guitar-zither, to allow removal of the latter from said chamber, as set forth.

2. A self-playing musical instrument, comprising a casing having a chamber for a guitar-zither, the chamber having an outline corresponding to that of the guitar-zither, supports in the chamber to support the guitar-zither above the bottom and below the top of the chamber, a hammer-action for sounding the strings of the guitar-zither, the hammer standing lengthwise of the strings and above the latter, a base-plate carrying the hammer-action and normally held in a fixed position on the casing over the guitar-zither, said base-plate being arranged to swing, and with it the hammer-action, to move the latter out of the way of the guitar-zither, to allow removal of the latter from said chamber, a motor arranged in said casing, in a chamber separate from the guitar-zither, and a driving mechanism for the note-sheet and carried by said base-plate and adapted to mesh with said motor, so that when the motor is started said driving mechanism is set in motion to cause the note-sheet to actuate the hammer-action, as set forth.

3. In a self-playing musical instrument, the combination with a support for a stringed musical instrument, of a base-plate hinged on the said support, and adapted to carry a note-sheet and the hammer-action, the latter comprising arms pivoted on the said base-plate and each adapted to be engaged at its free end by a note projection of the note-sheet, a lever for each arm and pivoted on the base-plate, a link connecting a lever with an arm, a spring hammer-handle secured at one end to the said lever and extending lengthwise of a string of the musical instrument, a hammer-head on the free end of the said hammer-handle and standing normally inactive, over a

string, to sound the same when the lever and its handle are actuated, and means for returning the action parts to a normal, inactive position, as set forth.

- 5 4. A self-playing musical instrument, comprising a bed-plate mounted to swing, a note-sheet mounted to turn on the bed-plate and provided with note projections and driving projections, the latter being arranged in a circle near the periphery of the sheet and spaced
10 equidistant apart, a driven toothed wheel for engaging the driving projections, a shaft car-

rying said wheel and journaled on said bed-plate, and a pinion on said shaft adapted to mesh with the gear-wheel of a stationary motor, as set forth. 15

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN KRUFTE.

Witnesses:

THEO. G. HOSTER,
EVERARD B. MARSHALL.