No. 840,397.

PATENTED JAN. 1, 1907.

A. J. SWING & K. A. GRANER.

MUSIC RECORDING DEVICE.

APPLICATION FILED FEB. 20, 1905.

2 SHEETS—SHEET 1.

Fig. 1.

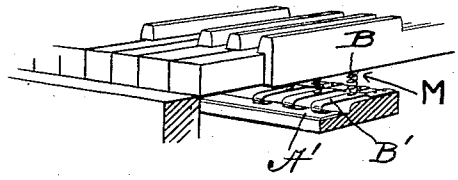


Fig. 2.

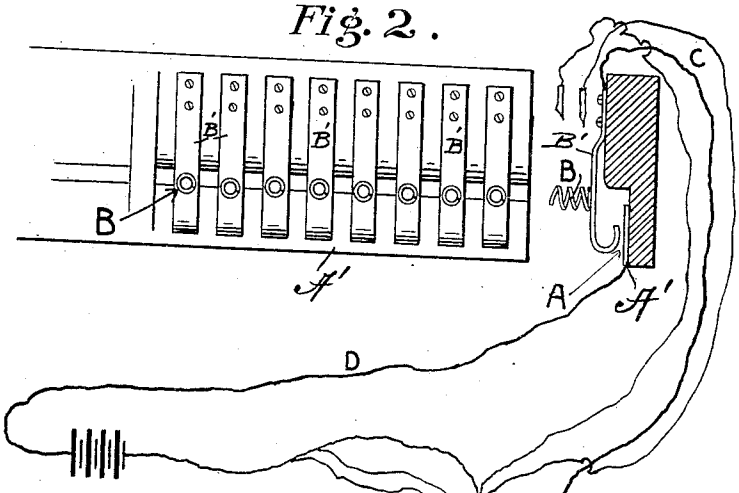


Fig. 3.

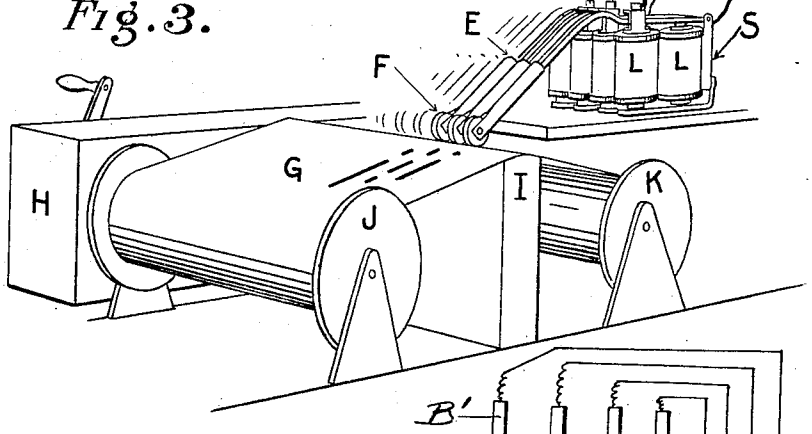
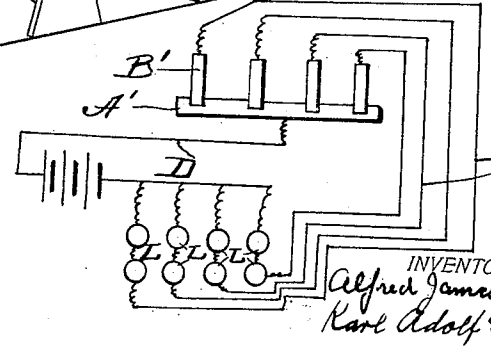


Fig. 7.



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MUSIC RECORDING DEVICE.

APPLICATION FILED FEB. 20, 1905.

2 SHEETS—SHEET 2.

Fig. 4.

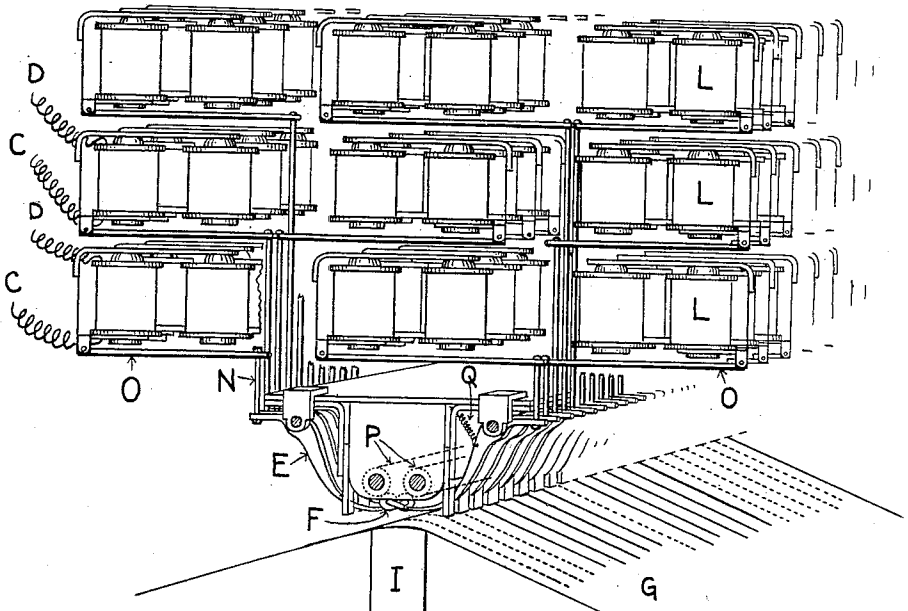


Fig. 5.

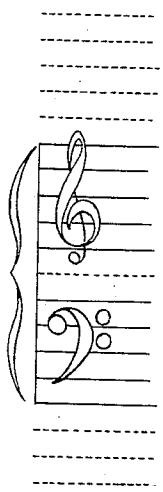
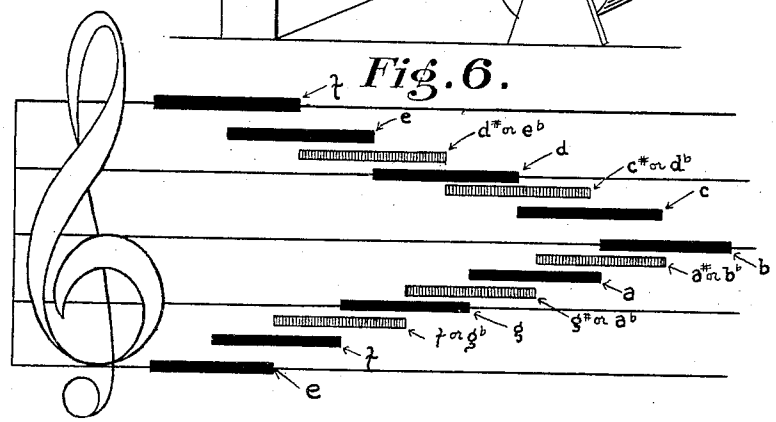


Fig. 6.



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UNITED STATES PATENT OFFICE.

ALFRED JAMES SWING AND KARL ADOLF GRANER, OF CINCINNATI, OHIO, ASSIGNORS, BY DIRECT AND MESNE ASSIGNMENTS, TO SAID SWING, JOHN SOFGE, AND EDWARD GARDNER, OF CINCINNATI, OHIO.

MUSIC-RECORDING DEVICE.

No. 840,397. Specification of Letters Patent. Patented Jan. 1, 1907.

Application filed February 20, 1905. Serial No. 246,553.

To all whom it may concern:

Be it known that we, ALFRED JAMES SWING and KARL ADOLF GRANER, residing in Cincinnati, in the county of Hamilton, in the State of Ohio, have invented a new and useful Music-Recording Device, of which the following is a specification.

Our invention, of which the following is a specification, relates to the utilizing of the touch of the performer when exerted in playing on the keys of the instrument to thereby set in motion (by mechanical or, preferably, electrical transmission) a number of levers provided with fountain-pens or, preferably, small revolving disks or points of absorptive material carrying ink in such a way that at each stroke of a key a dot or dash (of a length proportionate to the time the key is depressed) will be recorded on a slip of paper kept in motion at a uniform speed by rolls actuated by a motor which is controlled by a governor.

The object of our invention is twofold. It is either to make a record of such dimensions that by punching out each dot and dash it will at once be transformed into a serviceable and true music-roll for any self-player, such as the pianola or cecilian, &c., or to make a record on a special music-staff of our own design, which, owing to its similarity to the ordinary music-staff with notations, will be at once comprehensible and readable to the musician and for that person can be readily copied or written out into regular two-staff music. By this means it will be possible to preserve improvisations on the piano or organ and to make instantaneous notations for permanent record of nascent compositions, so as to render to the composer the same service that stenography does to the author and speaker. We attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 shows a series of electrical contacts placed at a convenient point under the keyboard. Fig. 2 shows a longitudinal top view of a series of electrical contacts. Fig. 3 shows the complete recording device as adapted to marking the paper-rolls to be stamped out for use on the self-players, (the pianola, &c.) Fig. 4 shows the recording device adapted to the still more narrow roll, having our special staff printed on it. The white keys are recorded in their proper place on the staff by black marks and the black keys by marks of a different color. Fig. 5 is a perpendicular section of our complete staff as printed on the paper-roll used in the key-recording device. Fig. 6 is a diagram of a section of our staff, considerably enlarged, so as to show distinctly the method of recording by different colors the white and the black keys in their respective places. Fig. 7 is a diagrammatic view showing the circuit arrangements between the battery, electromagnets, and the contacts of the keyboard.

In Fig. 3 the wires C D show the connection between the battery, one contact, and one electromagnet L L, which controls the lever E, which carries the marking device F, which in turn marks the paper G at a given point over the bed I as the paper is being wound from spool K to spool J by the spring-motor H. When the performer strikes a given key, the spring B is depressed, which instantly closes the electric circuit at A between contact-strip A′ and contact-fingers B′ and keeps it closed as long as the performer's finger keeps the key depressed. The current then flows through the wires C D to the particular electromagnet L L which corresponds to the particular key depressed. This in turn draws down the lever E and holds it down as long as its relative key is held down. The lever being held down by the electromagnet brings the marking device F into contact with the moving paper G at a given point over the center of bed I, and consequently a mark is begun on the moving paper. This mark is continued as long as the performer keeps the circuit closed by holding the key down. The paper-roll G, moving from spool K to J at a uniform speed, controlled by a governor which controls the motor H, will register the dots and dashes in various lengths running in parallel lines at equal distances. The levers E in a state of rest are held away from the electromagnets by springs, which causes the marking-rollers F, in a state of rest, to be held against a supply-roller carrying ink, which is placed just above them and is kept in rotation by the spring-motor at H, as carried out, not in this drawing, but in Fig. 4 at P. The motor at H is the ordinary spring-motor used for music-boxes and phonographs, &c., with a governor to control speed; but

any motive power may be substituted, so long as it is capable of producing a uniform rate of speed.

In Fig. 4, G shows the paper on which is printed our special recording-staff. This paper in motion slides over bed I, where the printing takes place. That portion of the levers E corresponding with the white keys of the piano are on one side of the supporting-frame, while on the other side are those corresponding with the black keys of the piano. When these levers are at rest, the little revolving disks F are pressed, by means of springs Q, against the ink-supply rollers P, which are kept revolving by pulleys (not shown in the diagram) driven by the spring-motor. The electromagnets L L are arranged in tiers of nine, (9,) and the magnetic armatures at O are connected with the levers E by connecting-rods N, so that when the circuit C D is closed the armature O rises and by the rod N pulls up the short end of the lever E, which throws the long end of the lever carrying the marking-roller F away from the ink-supply roller P and causes it to register upon the special staff-paper G in its proper place. The levers E are arranged in two sets, one on either side. One side rests against the revolving ink-supply roller P, carrying black ink, and registers in black marks on the paper all the white keys on the piano. On the other side the levers rest against the revolving ink-supply roller P, which carries red ink, and when they register on the staff they print and register the black keys on the piano in red lines.

Fig. 5 represents a perpendicular section of our special staff composed of the two ordinary staffs of five (5) black lines each, one for the treble and one for the bass clefs, with one dotted line or line of a different color at equal distances between them, and with three (3) dotted or of a different color lines added below them and five (5) dotted or colored lines added above them, as illustrated, to which additional dotted or colored lines may be added, if desired, either above or below. This staff is to be printed on the paper-roll before using it with the device illustrated in Fig. 4.

Fig. 6 illustrates an enlarged portion of said special staff with the black and red lines in the relation in which they are printed on the special staff by the device Fig. 4.

We are aware that prior to our invention the spring-motor with governor, the moving paper-roll, the marking devices, and the electromagnet have all been used. We therefore do not claim them as original; but

What we do claim as our invention, and desire to secure by Letters Patent, is—

1. In combination with means for feeding a paper strip, a series of electromagnets arranged in superimposed relation above said strip, a support underlying said electromagnets, spring-pressed levers carrying marking means at their lower ends pivoted on opposite sides of said support and having their marking means extending beneath said support, armatures for said electromagnets, connections between said armatures and said levers, and inking-rollers in said support normally engaged by said marking means.

2. In combination with means for feeding a paper strip, a support overlying said means, two series of levers pivotally secured to said support on opposite sides thereof, each of said levers carrying marking means on its lower end, a bed disposed beneath said marking means and having said paper strip passing thereover, and means for operating said levers.

3. In combination with means for feeding a paper strip, a support, series of levers pivotally suspended from said support on opposite sides thereof, marking means carried by the levers, a bed underlying said support and having said paper strip passing thereover, a series of electromagnets, armatures for said magnets, and vertically-extending rods connecting the outer ends of said levers and the outer ends of the armatures.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

ALFRED JAMES SWING.
KARL ADOLF GRANER.

Witnesses:
BLAKE L. RAYMOND,
WM. G. WILLIAMS.