No. 879,170. PATENTED FEB. 18, 1908.

W. H. HOSCHKE.

BELL CHIME FOR CLOCKS AND OTHER DEVICES.

APPLICATION FILED APR. 16, 1907.

3 SHEETS—SHEET 1.

Fig: 1.

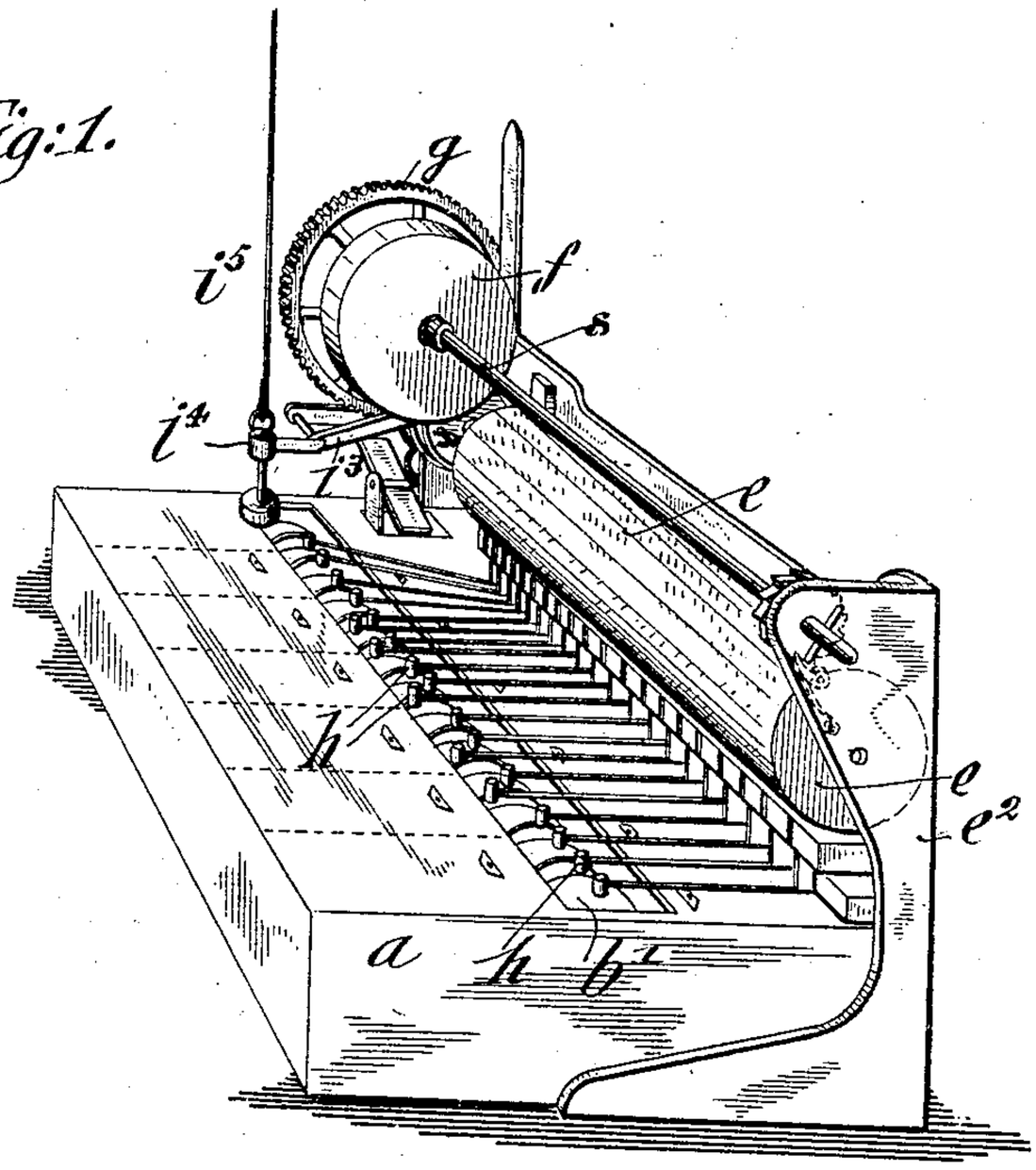
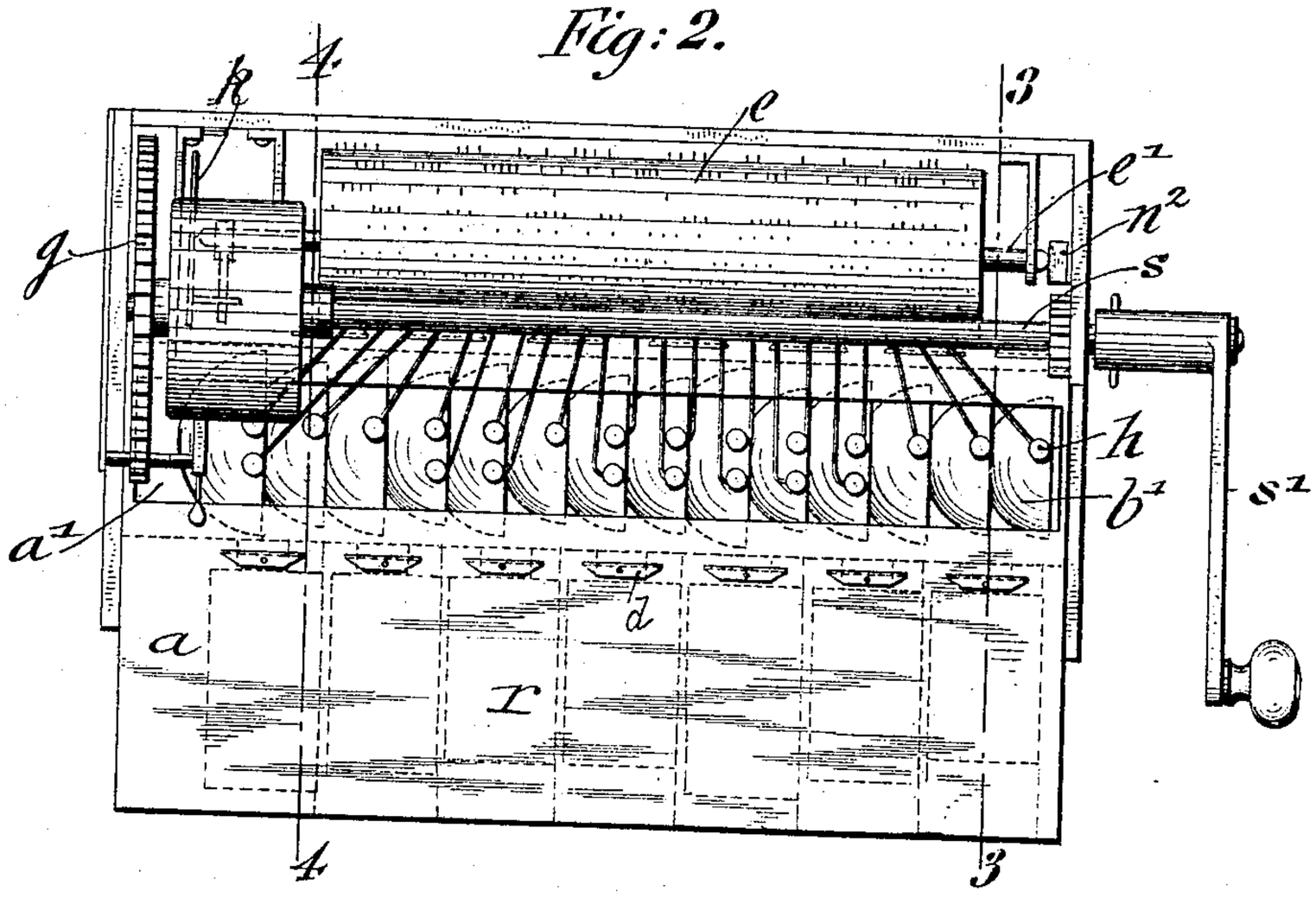


Fig: 2.



Witnesses
David Heine
H. J. Schreier.

Inventor
William H. Hoschke
By his Attorneys
Howson & Howson.

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3 SHEETS—SHEET 2.

Fig: 3.

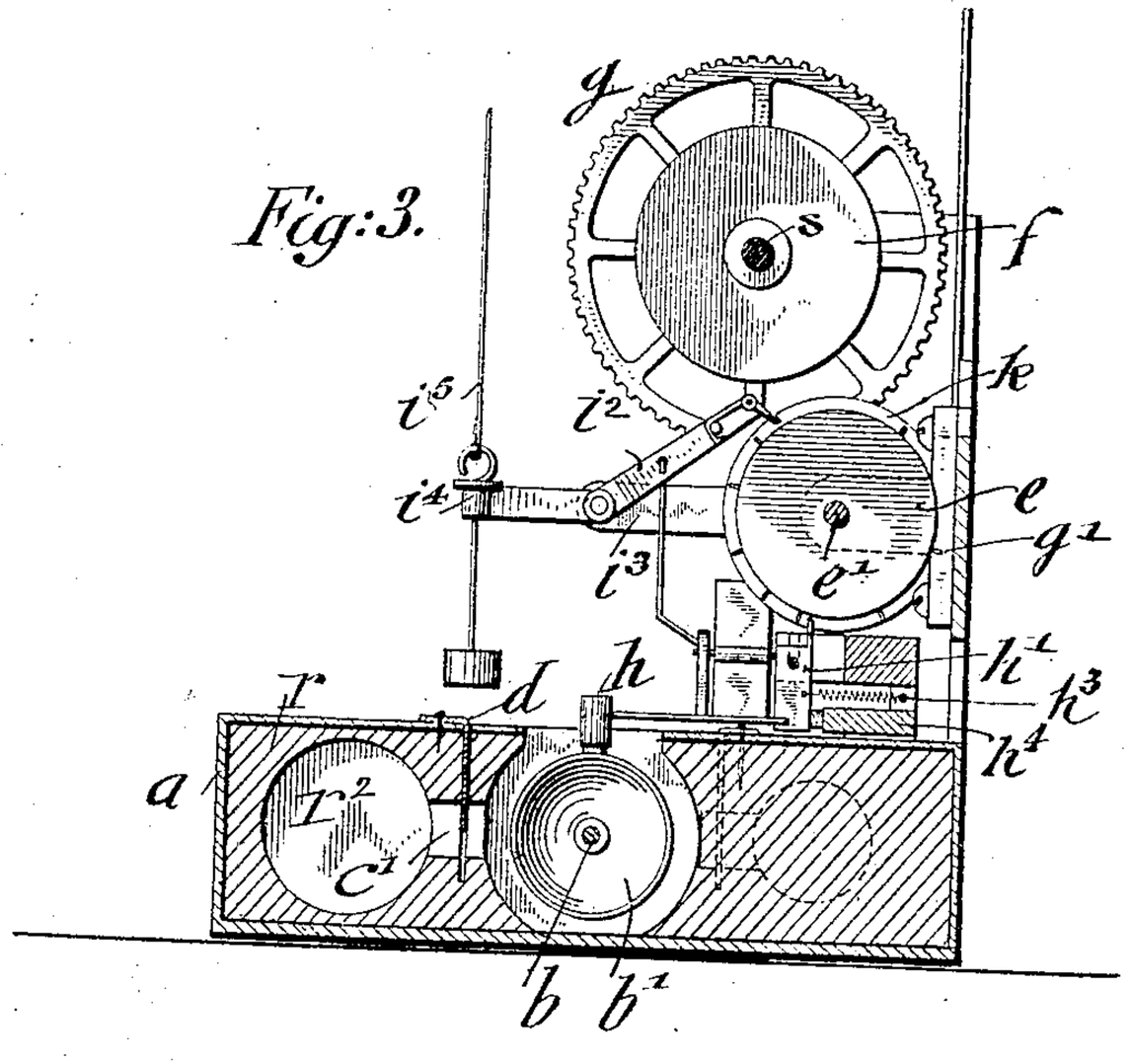
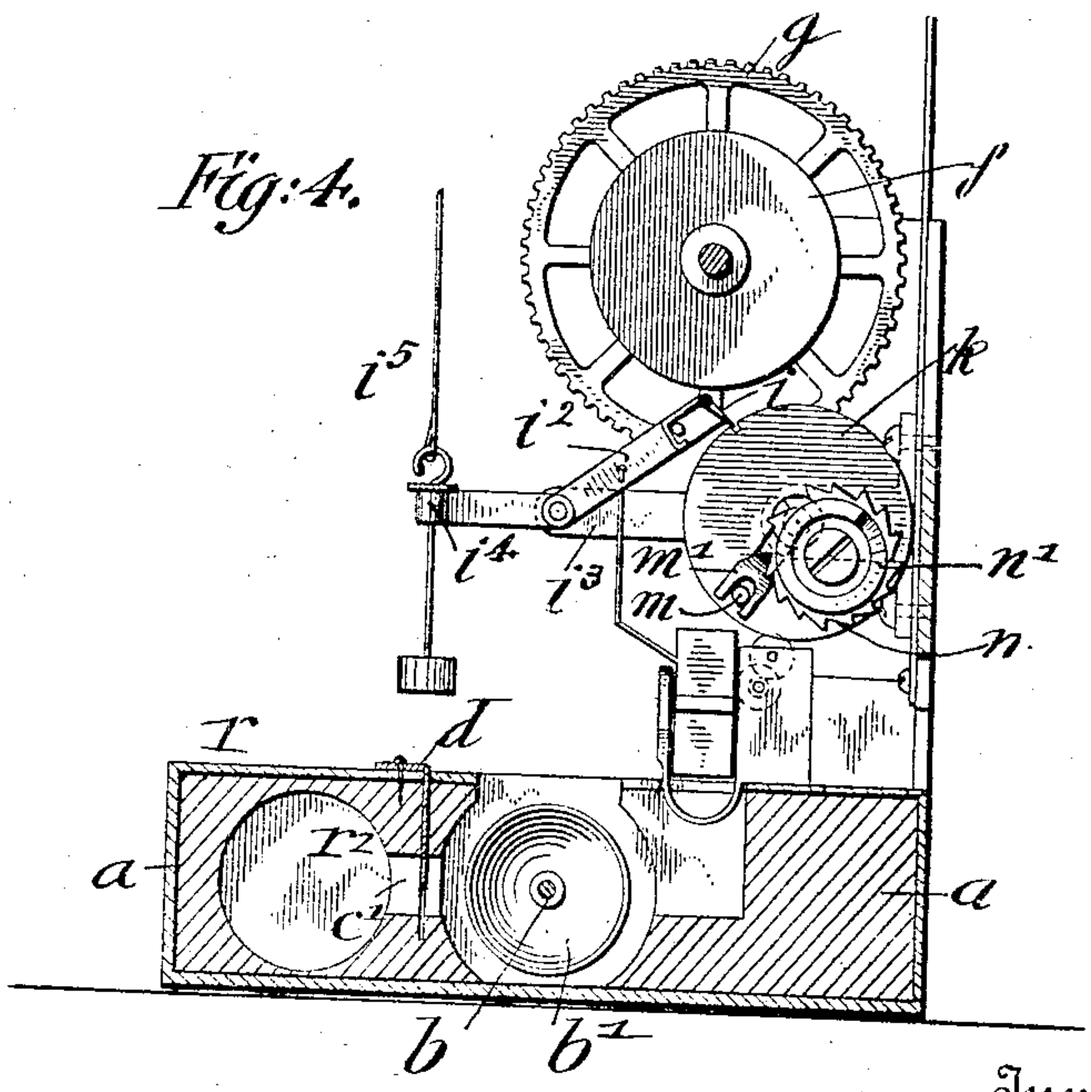


Fig: 4.



Witnesses
David Hepjue
W. Schreiber.

Inventor
William H. Hoschke
By his Attorneys
Fowler & Goepel.

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3 SHEETS—SHEET 3.

Fig: 5.

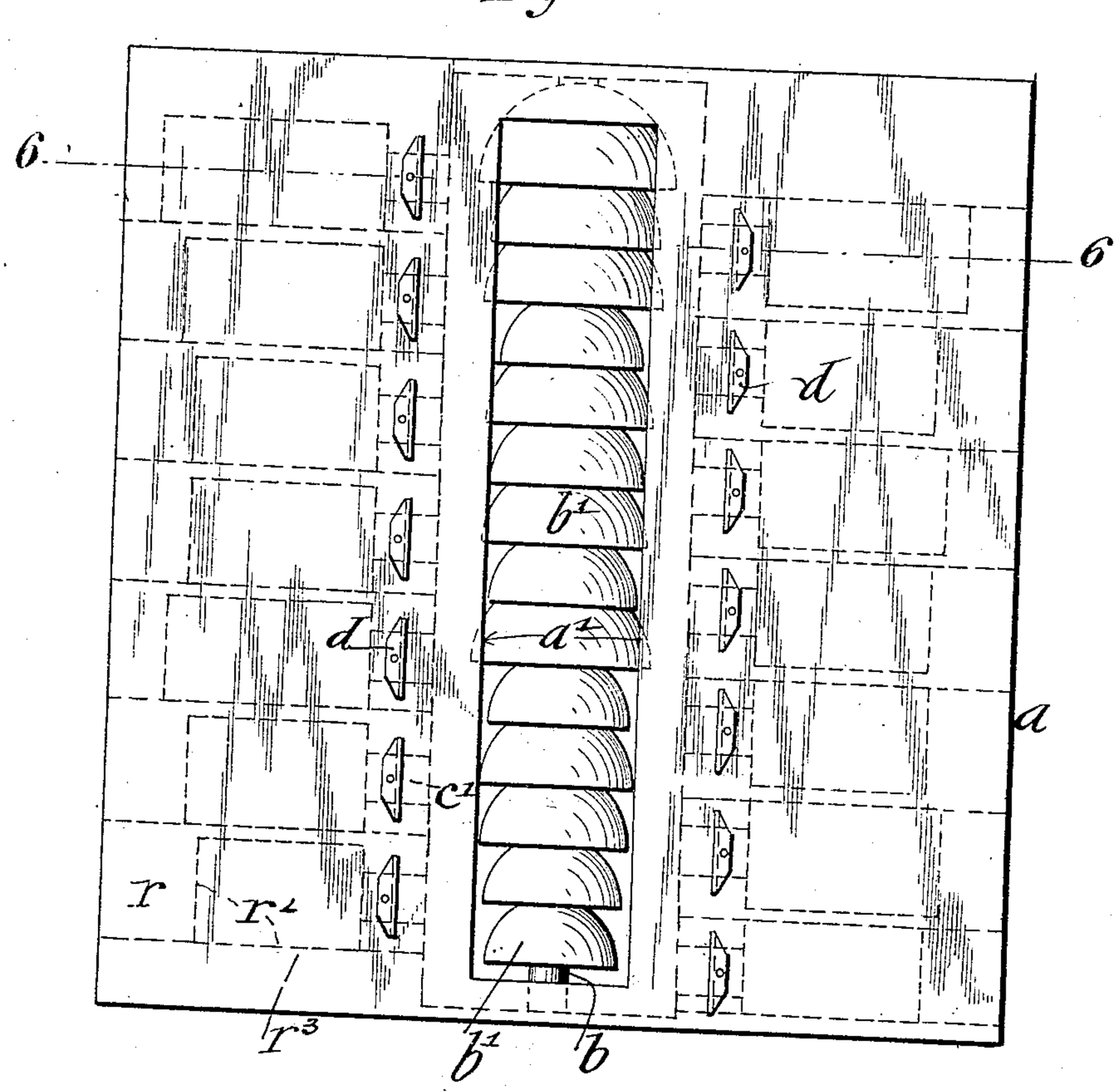
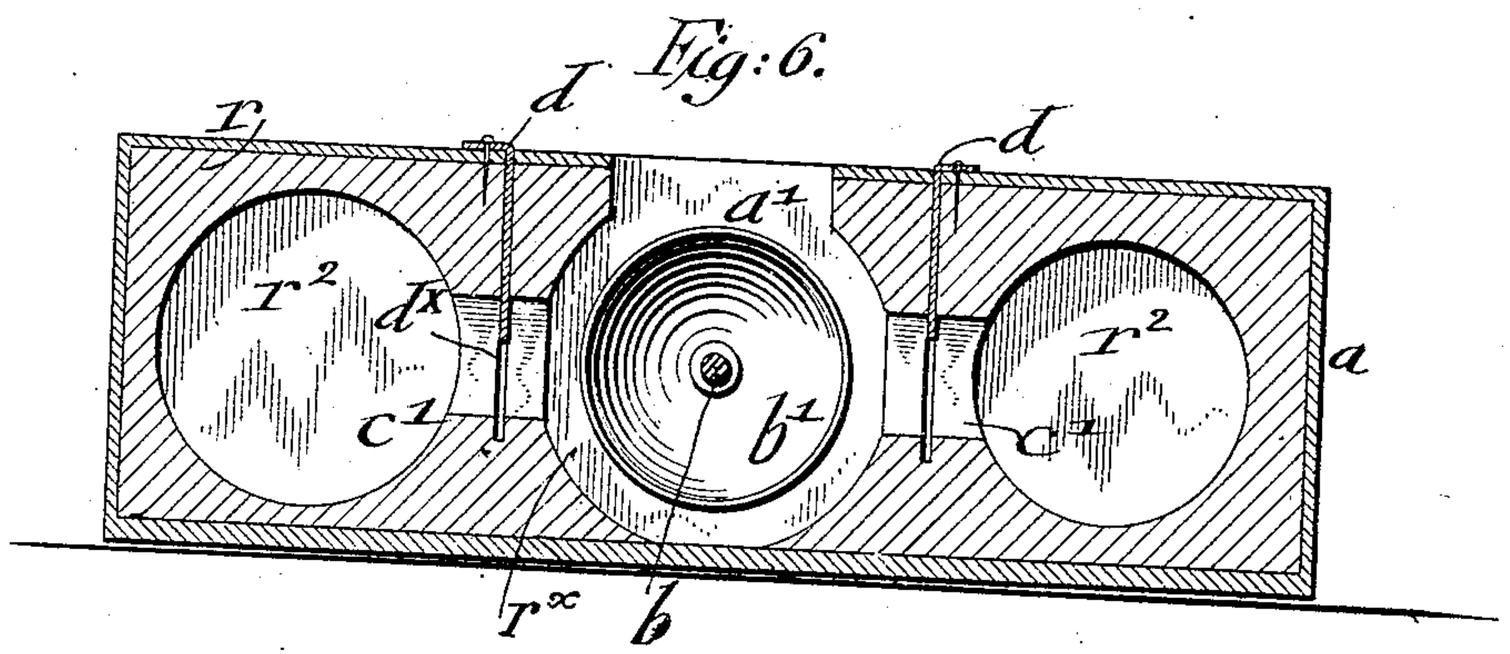


Fig: 6.



Witnesses
David Heine
H. L. Suhrbier.

Inventor
William H. Hoschke
By his Attorneys
Goepel & Goepel.

UNITED STATES PATENT OFFICE.

WILLIAM H. HOSCHKE, OF NEW YORK, N. Y., ASSIGNOR TO SONORA CHIME CO., OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

BELL-CHIME FOR CLOCKS AND OTHER DEVICES.

No. 879,170. Specification of Letters Patent. Patented Feb. 18, 1908.

Application filed April 16, 1907. Serial No. 368,562.

To all whom it may concern:

Be it known that I, WILLIAM H. HOSCHKE, a citizen of the United States, residing in New York, in the borough of Brooklyn, county of Kings, and State of New York, have invented certain new and useful Improvements in Bell-Chimes for Clocks and other Devices, of which the following is a specification.

This invention relates to an improved bell-chime for use in clocks and for other purposes.

The beautiful, rich tones which a bell used in connection with a resonator is capable of emitting cannot be brought out to advantage if the resonator is unduly limited in width. However, when a requisite number of resonators of the required width are placed alongside of each other the chime takes up a large space, and where the chime is used for clocks or in other locations where the space is limited resonators of the proper sizes cannot be arranged in this way. On the other hand, if the bells and their corresponding resonators are arranged in different rows, to enable resonators of the required width to be employed in a clock-case or other relatively narrow space, the height of the chime mechanism is correspondingly increased and the construction of the striking and driving mechanism is greatly complicated. A still graver objection to this arrangement is that the then radiated striking devices send the tones in different directions against different portions of the clock-case to find their way out through panels as best they can, and such tones, if they come out audibly at all, reach the ear in a more or less indistinct fashion.

The object of the present invention is to overcome the above-mentioned defects and to provide a construction in which resonators of the required width are arranged in such a manner with respect to the bells that great economy of space is produced. To this end the bells are arranged in one row, while their resonators radiate therefrom at opposite sides, so that such resonators can be given a greater width than that taken up by the bells to which they belong. In this manner the requisite number of bells may be placed into a clock-case of ordinary size and the actuating mechanism retains its simple construction as the striking-hammers are all placed in one row. Further, by this arrangement the sounds are sent out of the clock through one common opening cut opposite the bells, so that such sounds are not impeded by encountering any wall or other obstruction.

A further object of the invention is to provide an arrangement of the resonators whereby the bells are placed in such a manner that the resonators opposite the same are not those which will bring out any of the overtones of the bells, which would impair the musical effect.

A further object of the invention is to provide an improved form of resonator, of simple and cheap construction, and provided with means whereby the same may be attuned with its corresponding bell.

With these ends in view, the invention consists in a bell-chime which comprises the novel features of construction and combinations of parts to be hereinafter described and claimed.

In the accompanying drawings, Figure 1 represents a perspective view of my improved bell-chime for clocks, Fig. 2 is a plan-view of Fig. 1, Figs. 3 and 4 are vertical transverse sections on lines 3, 3, and 4, 4, Fig. 2, Fig. 5 is a plan-view of the bell-chime, drawn on a larger scale and with the striking devices removed, and Fig. 6 is a vertical transverse section on line 6, 6, Fig. 5.

Similar letters of reference indicate corresponding parts in the different figures of the drawings.

Referring to the drawings, *a* represents the case of my improved bell-chime, which is preferably made of rectangular shape, and provided with an open space a^1 at the center and with blocks of wood or other suitable material at both sides. In the open central space of the case *a* is arranged a longitudinal rod *b* on which are supported a number of bells b^1 in a row in such a manner that one bell projects partly into the adjacent bell, said bells being separated from each other by suitable washers. Each bell is fixed in position on the rod *b*.

Each resonator *r* is made out of a solid block, preferably of wood. At the side of the block adjacent the corresponding bell there is bored out a half circle and the size of this half circle does not vary for the different tones to be produced. By cutting this half circle out of the block a chamber $r^{\times}$ adjacent the bell is formed. In each block there is also bored out a resonator-chamber r^2 which

extends transversely of the block and which does not extend completely through the latter but only to within a certain distance from the bottom or back of the same. These openings or bores, which constitute the resonators proper, vary in size according to the tones which are to be produced. A channel or throat c^1 is bored in each block longitudinally thereof and extends between the half circle previously mentioned which is adjacent the bell and the resonator. The sets of resonators are then glued together, requiring but one additional wall or partition which is placed over the first resonator in order to form the front-wall r^3 thereof. The backs of the other resonators form the fronts of the resonators at the rear of the same, as shown in Fig. 5. By this arrangement the construction of the chime is considerably cheapened and the resonators have the important advantage that they do not leak, which commonly occurs in jointed resonators and renders them entirely useless.

By using a longer or shorter channel or throat the same size of resonator-chamber may be used for various tones, which is, for economy in space, vitally important in many cases. The bells and resonators are so grouped that no resonator is placed opposite a bell to any of the overtones of which it will correspond. At the throat of each resonator a saw-cut or kerf $d^\times$ is made in the block, across the same from the top downward to about the center of the throat, in which a plate d of metal or veneer is inserted and pushed in more or less so as to reduce the size of the opening in the throat, until the desired tone of the resonator is obtained. The chamber $r^\times$ of each resonator, which might be termed the inlet-chamber, has a number of purposes, all of which are of the utmost importance. It prevents interference of the tone of one bell with the tones and vibrations of its neighboring bells where bells are grouped closely together. It gathers the vibrations of the bell and leads them into the channel or throat c^1, from which they pass into the resonator-chamber, and in this way the musical result is stronger and more distinct. Said chamber also acts as a part of the resonator as regards the resulting pitch, that is, without it the inner resonator-chamber would have to be larger, so that said inlet-chamber saves space. Said inlet-chamber also serves the very important function of keeping the resonator in tune under altered conditions. A resonator which is not constructed in this manner and is placed in a narrow space, as in a clock, will change its pitch and become useless, being then lower in tone than its bell.

In making the resonator, it is of course endeavored to make it in tune with its bell as closely as possible; but as this attuning depends upon a number of conditions it is quite difficult to bring it about without subsequently changing the resonator. In case the resonator is too low in tone and will not respond to the bell, the tone is made higher by drilling a small hole in that wall of the resonator which is not to be placed afterward near any other wall. In case the drilling of this hole does not sufficiently raise the tone the size of the hole may be increased or another hole drilled in the resonator until the resonator responds to the bell. In case the resonator is too high in tone, the throat or channel c^1 is partially obstructed in the manner hereinbefore described.

Above the row of resonators is arranged a plurality of striking-hammers h, the shanks of which are applied to blocks h^1 which are pivoted to a common longitudinal rod, said blocks being provided at the upper ends with fingers which are engaged by the projecting teeth of an actuating-cylinder e, the shaft e^1 of which is supported in bearings of upright standards e^2 attached to the base-block a. The faces of the hammers are provided with small blocks of felt with which they strike on the bells, several hammers being arranged for those bells which are most frequently called into action so as to permit quick repetition of the same tone. The hammers are connected below their pivot-rod with a helical spring h^3 which is supported in a frame and also cushioned by small felt blocks against a rail h^4, as shown in Fig. 3. Some of the hammer-stems have to be bent over from the blocks towards the bells so as to bring them all within the reach of the actuating pin-cylinder.

The actuating pin-cylinder is made in the same manner as the cylinders in music-boxes, with pins arranged to play a number of tunes. The actuating pin-cylinder is driven by means of one or more motor-springs which are inclosed in suitable cylinders f that are located on a shaft s and wound up from time to time by a hand-crank s^1 that is applied to the end of the shaft s. The spring-box is held in tension by means of a pawl-and-ratchet mechanism which is located on one of the supporting-standards e^2, as shown clearly in Fig. 1. Motion is transmitted from the cylindrical casing of the motor-spring to the shaft of the actuating-cylinder by means of a gear-wheel transmission g, which also drives by a small gear-wheel a fly mechanism for regulating the speed of the actuating pin-cylinder.

A disk k on the shaft of the pin-cylinder is provided with a notch which is engaged by a pawl i that is applied to an elbow-lever i^2 which is fulcrumed to a stationary arm i^3 supported on the upright standard, the outer end of said lever i^2 being connected by an eye i^4 at its outer end with a weighted trip-rod i^5, the upper eye-shaped end of which is connected by a cord or metallic rod with the

hour-striking device of the clock so that every hour the pawl is released by the dropping of the lever from the notched disk, and thereby the motor and the actuating pin-cylinder are released for actuating the hammers and playing the chime. After the rotation of the actuating-cylinder the pawl drops again into the notch of the disk so as to be ready for releasing the actuating pin-cylinder for the playing of the chime at the striking of the next hour, and so on.

On the intermediate disk is arranged a crank-pin m which engages a forked arm m^1 that is keyed to the shaft of the pin-cylinder and by which rotary motion is transmitted to the same. On the disk k is arranged a fixed ratchet-wheel n and a raised snail n^1 provided with steps which serve to engage the end of the shaft of the pin-cylinder so as to impart to the same a lateral shifting motion in its bearings against the tension of a flat spring n^2 which acts on the opposite end of the shaft of the pin-cylinder and holds the same against the face of the steps of the snail on the disk k, each step of the snail corresponding to a number of pins on the pin-cylinder which, for each full rotation of the same, play one of the tunes for which the chime is arranged.

The mechanism by which intermittent rotary motion is imparted to the cylinder and the release mechanism for playing the different tunes successively are well known and form no part of the present invention, which relates entirely to the grouping of the bells and to the arrangement of the same in a row and to the grouping of the resonators at both sides of the bells.

The principal advantages of the improved bell-chime are that while the resonator-chambers are sufficiently wide, they are grouped in such a manner as to produce great economy of space, so that the chime may be readily placed in the case of a mantel clock or in the lower part of a hall clock. A further advantage is that the sounds can pass freely without interference directly from the bells out of the case. Further, the confusion of individual tones emitted by the bells is entirely obviated. Also the resonators are of simple and cheap construction and may be readily and exactly attuned with their corresponding bells.

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

1. A bell-chime comprising a plurality of bells arranged in one row, and resonators for said bells arranged in rows adjacent the latter.

2. A bell-chime comprising a plurality of bells arranged in one row, and resonators, one for each bell, arranged in rows at opposite sides of said row of bells.

3. A bell-chime for clocks, comprising a plurality of bells arranged in a row, resonators arranged alternately for every bell in groups at opposite sides of said row of bells, hammers for striking the bells, and means for actuating the hammers.

4. A bell-chime for clocks, comprising a plurality of bells arranged in a row, resonators for each bell grouped at opposite sides of the row of bells, hammers for striking the bells, and means for actuating the striking-hammers.

5. In a bell-chime for clocks, a plurality of bells, a rod for supporting said bells in a row, a casing inclosing the bells and open above the bells, and two groups of resonators in said casing at opposite sides of the row of bells, the resonators of each group corresponding alternately with the bells.

6. In a bell-chime for clocks, the combination of a casing having an upper longitudinal opening, a plurality of bells arranged in a row within said casing and below said opening, and resonators in said casing and arranged in rows at opposite sides of the bells, said resonators having inlet-chambers or mouths communicating directly with the opening of said casing.

7. In a bell-chime for clocks, the combination of a plurality of bells arranged in a row, a rod passing through the bells for supporting the same, a frame for supporting the rod and open at the middle portion, and two groups of resonators arranged adjacent to and at opposite sides of the bells, the resonators of one group corresponding with every alternate bell and the resonators of the other group with the other bells of the row.

8. In a bell-chime for clocks, a resonator having a resonator-chamber and a throat leading thereto, there being a kerf cut in said resonator and communicating with said throat, and a plate in said kerf by which said throat may be more or less obstructed.

9. In a bell-chime, a plurality of resonators consisting of blocks, each having a resonator-chamber therein which is bored out of one face and extends to within a short distance of the opposite face or back of the block, said resonators being so assembled that the back of one covers the front of and incloses the adjacent resonator.

10. In a bell-chime, the combination of a plurality of bells arranged in a row, and resonators for said bells, each resonator being placed opposite a bell to any of the overtones of which it will not respond.

In testimony, that I claim the foregoing as my invention, I have signed my name in presence of two subscribing witnesses.

WILLIAM H. HOSCHKE.

Witnesses:

PAUL GOEPEL,

HENRY J. SUHRBIER.