B. W. SWEET.

SELECTIVE RINGING MAGNETO BELL.

APPLICATION FILED SEPT. 8, 1905.

929,995. Patented Aug. 3, 1909.

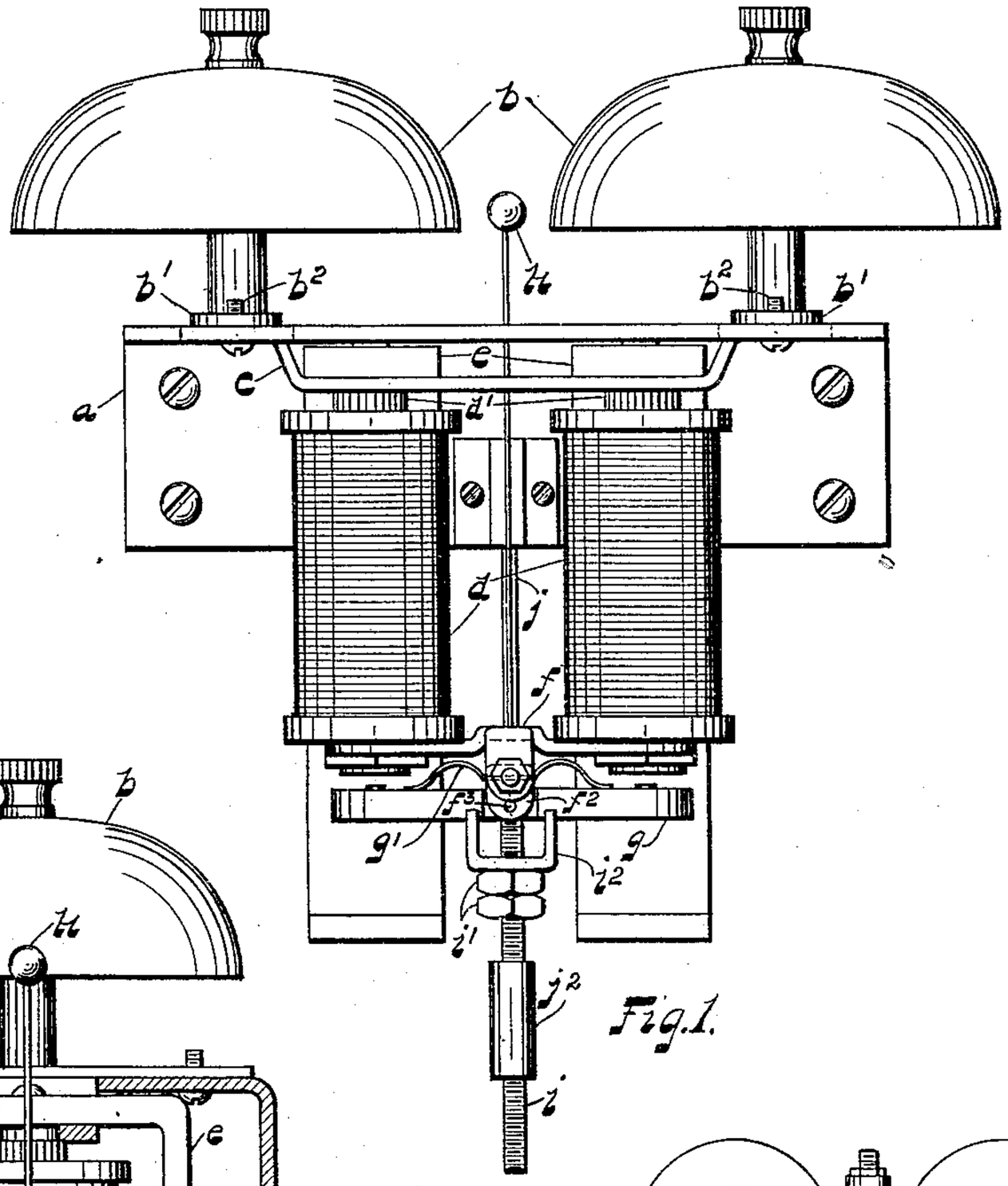

Fig. 1.

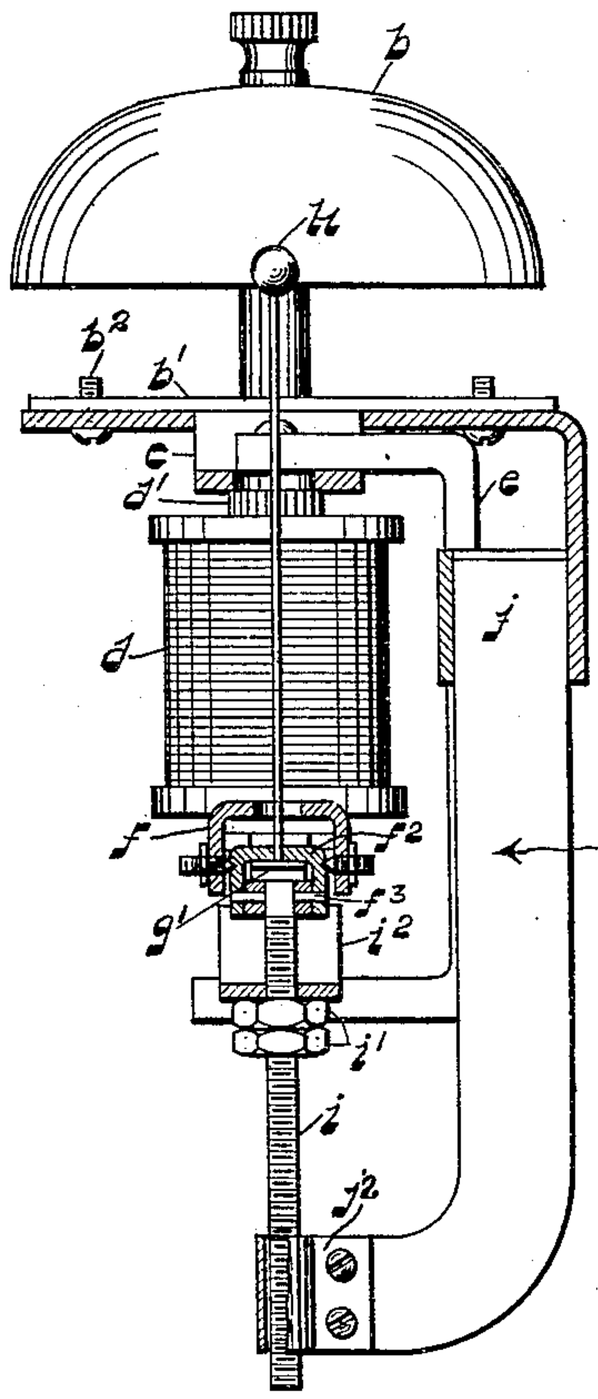

Fig. 2.

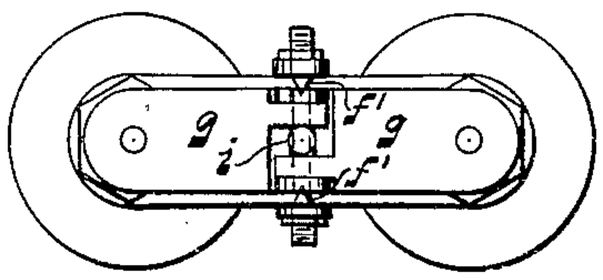

Fig. 3.

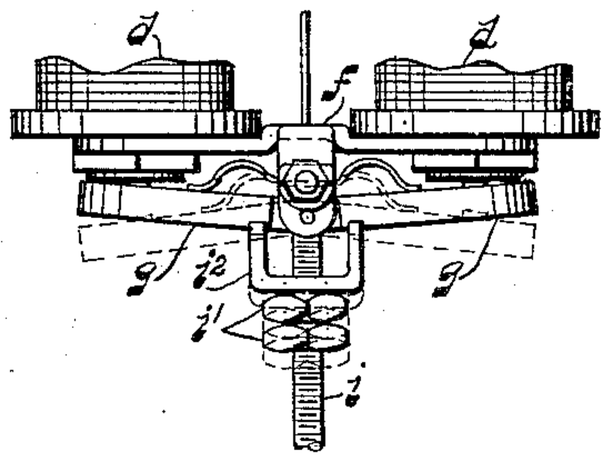

Fig. 4.

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UNITED STATES PATENT OFFICE.

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SELECTIVE-RINGING MAGNETO-BELL.

No. 929,995. Specification of Letters Patent. Patented Aug. 3, 1909.

Application filed September 8, 1905. Serial No. 277,519.

To all whom it may concern:

Be it known that I, BURTON W. SWEET, a citizen of the United States of America, and a resident of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Selective-Ringing Magneto-Bells, of which the following is a specification.

My invention relates to improvements in selective magneto bells especially adapted for use upon telephone party lines, the same being of such character as to permit of individual signaling from a central office or exchange, where two or more of such magneto bells are bridged across or otherwise associated with the telephone line conductors.

My invention has particularly to do with certain features of construction which I shall hereinafter explain, and which serve to simplify and render more effective a selective ringer, while departing from the standard ringer to an extent which will still permit of my improved bell to be used interchangeably therewith in instruments at present in use. This latter feature, however, is of practical, though somewhat incidental character, since I have adhered to the general type of standard magneto ringers in several particulars, because of the fact that experience has shown this type to be extremely efficient. My departures therefrom, I may briefly indicate below and in the accompanying claims. This ringer, it will be understood, preferably is provided with two exciting spools and pole pieces, before which the armature oscillates under the influence of alternating current. The magnetic system of my ringer, however, is altered to the extent that separate polarizing magnets are provided for each pole piece or core, thus rendering it more effective. Again, the air gap between the pole pieces and oscillating armature is variable by means of a screw-adjustment associated with the armature. The length of the spools and cores may be varied, if desired, to improve the selective function; to which end, I also may alter the length, rigidity and weight of the bell-hammer and stem. It should be observed, however, that only a portion of my invention is limited in its application to selective-ringing apparatus.

Further features of my improvements will be more readily appreciated, and will be explained by making reference to the accompanying sheet of drawings, wherein:—

Figure 1, is a front elevation of a selective ringer constructed in accordance with my improvements. Fig. 2, is a central vertical section through a bell of similar construction, but of different selective characteristics. Fig. 3, is an under-side view of the magnet spools and sectional armature; and, Fig. 4, is a detail serving well to illustrate the construction whereby the adjustment of the armature is obtained.

In all of these figures the same character of reference is employed to indicate similar parts.

The angular metal frame-plate *a* serves as a mounting for the several parts of the bell-structure. Each of the bells or gongs *b*, is mounted upon a strap *b'*, which is adjustable by means of a screw b^2, extending through a slot cut in the frame-plate. Strap *c*, stamped integrally from said frame-plate, serves as a mounting for the bell magnets and associated parts.

The cores *d'* of the electromagnet spools *d* are magnetically united by the strap *c*; while above each is disposed the permanent magnet *e*, serving to polarize the structure. Carried at the opposite ends of the pole pieces or cores *d'*, and within the magnetic fields, is the yoke *f*. Pivot-points *f'* extending therethrough laterally engage the housing f^2 which carries the pivot mounting f^3 of the armature *g*, the bell-hammer *h*, and the adjusting-screw *i*. Said armature is made in two sections *g*, *g*, as best shown in Figs. 3 and 4, and all of the parts are mounted to oscillate on the pivot points *f'* under the influence of proper selective alternating current. The stiff ox-bow spring *g'* opposes the action of the nuts *i'* and adjusting-bridge i^2 mounted upon the threaded stem *i*; said bridge preferably being of iron or steel, and assists in magnetically uniting the armature sections. At the rear of the structure, a retarding-member or spring *j* is

rigidly secured centrally to the frame-plate *a*, the same carrying at its lower end a sleeve j^2, which closely embraces the stem *i*, and tends to check or prevent its vibration, and the vibration of the bell-tapper and armature, and normally holding the parts in a central or median position, as shown in Fig. 1.

By referring to Fig. 4, it will be seen that the armature sections *g* have a very wide range of adjustment toward and from the cores *d'*, although the bell-tapper is securely held in a permanent mounting upon said cores or pole pieces, and in permanent relation to the bells. Each of the armature sections *g* is movable against the tension spring *g'* toward and away from the magnet cores, depending upon the position of the magnetic adjusting bridge i^2, and its nuts *i'* threading upon the stem *i*. Thus in Fig. 4, the full line position of these parts shows the armature-sections practically in engagement with the pole-pieces, while the dotted line position thereof illustrates the armature-sections angularly positioned to insure considerable separation from the cores. This adjustment serves materially to regulate the selective characteristics of any particular bell; the wider air gap corresponding to currents of successively lower frequencies.

Comparing the structures of Figs. 1 and 2, it will be seen that in the former, longer magnet spools and cores are provided, thus securing a longer stem for the bell-hammer, and moreover, the duplicated polarizing members *e*, are relatively longer and farther removed from the armature than in the structure of Fig. 2. Again, the retarding-member or spring engages the threaded stem a little closer to the pivot mounting in the structure of Fig. 1, than in the high frequency ringer. The shorter bell-tapper of Fig. 2 is made of steel wire, somewhat stiffer than that of Fig. 1, and the weight of its hammer is a trifle greater. Accordingly, it will be appreciated that the structure of Fig. 1 is designed for selective actuation by currents of relatively much lower frequency, than is the bell of Fig. 2. Each of these selective ringers, however, is capable of material adjustment within itself, as by varying the air gap between the armature and pole pieces, and the stiffness and weight of the bell-tapper and stem, so that the said ringers may be individually adjusted for response to selective currents of different frequencies. Preferably, the retarding-spring *j* is securely held upon the frame-plate, but its point of engagement with the stem *i* may be altered, if desired, by releasing its fastenings and moving the spring up or down within its loop or clamp upon the frame-plate. For example, upon a four-party line, I preferably employ the bell of Fig. 1 for the lower frequency current, and three bells of the type of Fig. 2 for selection by current of succeeding high frequencies. For such a line, I may employ alternating selective currents of 20, 40, 60 and 80 cycles. If a six-party line were desired, I should employ two adjustable bells of the type of Fig. 1, and four adjustable bells of the type of Fig. 2; although I wish it to be understood that the latter type is well adapted for use alone upon four-party lines; providing, as it does, a wide range of adjustment.

In operation, I have found that the bell of my invention is extremely efficient and free from the defect of giving false signals. The non-selective bells show some slight vibration of the armatures, but the retarding-springs, the air gap, and the varying length or stiffness of the bell-tappers combine to prevent the vibration of the bell-hammers for sounding the bells. Starting from a state of rest, however, under the influence of proper current, an adjusted bell-hammer will almost immediately attain its selective vibration and give the appropriate signal.

Having now described structures embodying my improvements, I consider that the important and novel features thereof are those set forth in the appended claims. Accordingly, I claim, and desire to secure by Letters Patent, the following;—

1. In an electromagnetic device, the combination with the exciting electro-magnet, of a sectional armature mounted before the poles of the electromagnet, and means for adjusting the armature sections with respect to each other and to the poles, whereby the air-gap is regulated, substantially as set forth.

2. In a selective magneto bell, the combination with the electro-magnet thereof, of a sectional armature mounted to oscillate in a fixed position before its poles, a bell-tapper actuated thereby, and a screw-adjustment associated with the armature adapted to adjust the air gap between the sections of the armature and the magnet poles, substantially as set forth.

3. In a selective magneto bell, the combination with the electro-magnet thereof, of an armature mounted to oscillate in a fixed position before its poles, a bell-tapper actuated thereby, a screw-adjustment associated with the armature adapted to adjust air-gap between the armature and the magnet poles, and a retarding-member associated with the armature and bell-tapper, adapted normally to withhold the same from vibration, substantially as set forth.

4. In a magneto electric bell, the combination with the electro-magnet thereof adapted to be traversed by exciting alternating currents, of a sectional armature pivoted

to be oscillated before the poles thereof, means for normally polarizing the electro-magnet and armature, and a screw adjustment and opposing spring associated with said sectional armature, whereby the air gap may be varied without altering the pivotal mounting of the armature, substantially as set forth.

5. In a magneto electric bell structure, the combination with the electro-magnet thereof, of a yoke mounted upon the pole-pieces of said magnet, an armature pivoted within the yoke, a bell-tapper actuated by the armature, and a spring and opposing screw adjustment associated with the armature, said armature being formed in sections, whereby its relative position with respect to the pole-pieces may be adjusted without altering its pivotal mounting, substantially as set forth.

6. In a magneto electric bell structure, the combination with the electro-magnet thereof, of a yoke mounted upon the pole-pieces of said magnet, an armature pivoted within the yoke, a bell-tapper actuated by the armature, a spring and opposing screw adjustment associated with the armature, said armature being formed in sections, whereby its relative position with respect to the pole-pieces may be adjusted without altering its pivotal mounting, means for polarizing the electro-magnet and armature, and a retarding-member adapted to oppose the vibration of said armature and associated parts, substantially as set forth.

7. In a selective telephone-call appliance, the combination with an electro-magnet designed to be traversed by selective currents, of a sectional armature pivotally mounted upon said magnet, a tuned bell-tapper mounted to be actuated by the armature, gongs or bells positioned to be sounded thereby, individual permanent magnets for polarizing the respective pole-pieces or cores of the electro-magnet and the armature, a screw-adjustment operating upon the sectional armature for regulating the air gap between it and the pole-pieces, substantially as set forth.

8. In a selective telephone-call appliance, the combination with an electro-magnet designed to be traversed by selective currents, of a sectional armature pivotally mounted upon said magnet, a tuned bell-tapper mounted to be actuated by the armature, gongs or bells positioned to be sounded thereby, individually permanent magnets for polarizing the respective pole-pieces or cores of the electro-magnet and the armature, and a retarding and centering member associated with the armature, adapted normally to check its vibration under the influence of non-selective currents, substantially as set forth.

9. An actuating movement for electric bells, comprising a pivoting yoke, an armature formed of two pivoted sections, a bell-tapper actuated thereby, a screw-threaded stem, and an opposing spring and screw-adjusting means acting upon said stem for varying the position of the armature sections, substantially as set forth.

10. A selective telephone-call actuating movement, comprising a pivoting yoke, an armature formed of two pivoted sections, a bell-tapper actuated thereby, a screw-threaded stem, an opposing spring and screw-adjusting means acting upon said stem for varying the position of the armature sections, and a retarding member engaging the stem beyond the screw adjustment, whereby the parts are restrained from vibration under the influence of non-selective currents, substantially as set forth.

11. The combination in a magneto call bell appliance, with the exciting windings and cores forming its electromagnet, of a sectional armature pivotally mounted in permanent relation with respect to said magnet, gongs or bells and a bell-tapper adapted to sound the same when actuated by the armature, a spring and opposing magnetic bridge-piece, and a screw-adjustment acting thereon to alter the relation of the armature sections, substantially as set forth.

12. In a selective magneto call-bell appliance, the combination with the exciting windings and cores forming its electro-magnet, of a sectional armature pivotally mounted in permanent relation with respect to said magnet, gongs or bells and a bell-tapper adapted to sound the same when actuated by the armature, a spring and opposing magnetic bridge-piece, a screw-adjustment acting thereon to alter the relation of the armature sections, and a retarding-member normally maintaining in median position the armature and associated parts and preventing their vibration, substantially as set forth.

13. In a magneto-electric signaling appliance, the combination with the electromagnet thereof, of a sectional armature mounted to oscillate before the electromagnet; the sections thereof being adjustable with respect to each other and to the electromagnet, a magnetic bridge piece, means associated therewith for securing the adjustment of the armature sections, and additional means for effecting a signal governed by the oscillation of the armature, substantially as set forth.

14. In a magneto-electric signaling appliance, the combination with the electro-magnet thereof, of a sectional armature mounted to oscillate before the electromagnet; the sections thereof being adjustable with respect to each other and to the electro-mag-

net, means associated therewith for securing the adjustment of the armature section, a relatively stiff retarding and centering spring associated with the armature, and additional means for effecting a signal governed by the oscillation of the armature, substantially as set forth.

Signed at Cleveland, this 6th day of September, 1905, in the presence of two subscribing witnesses.

BURTON W. SWEET.

Witnesses:

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