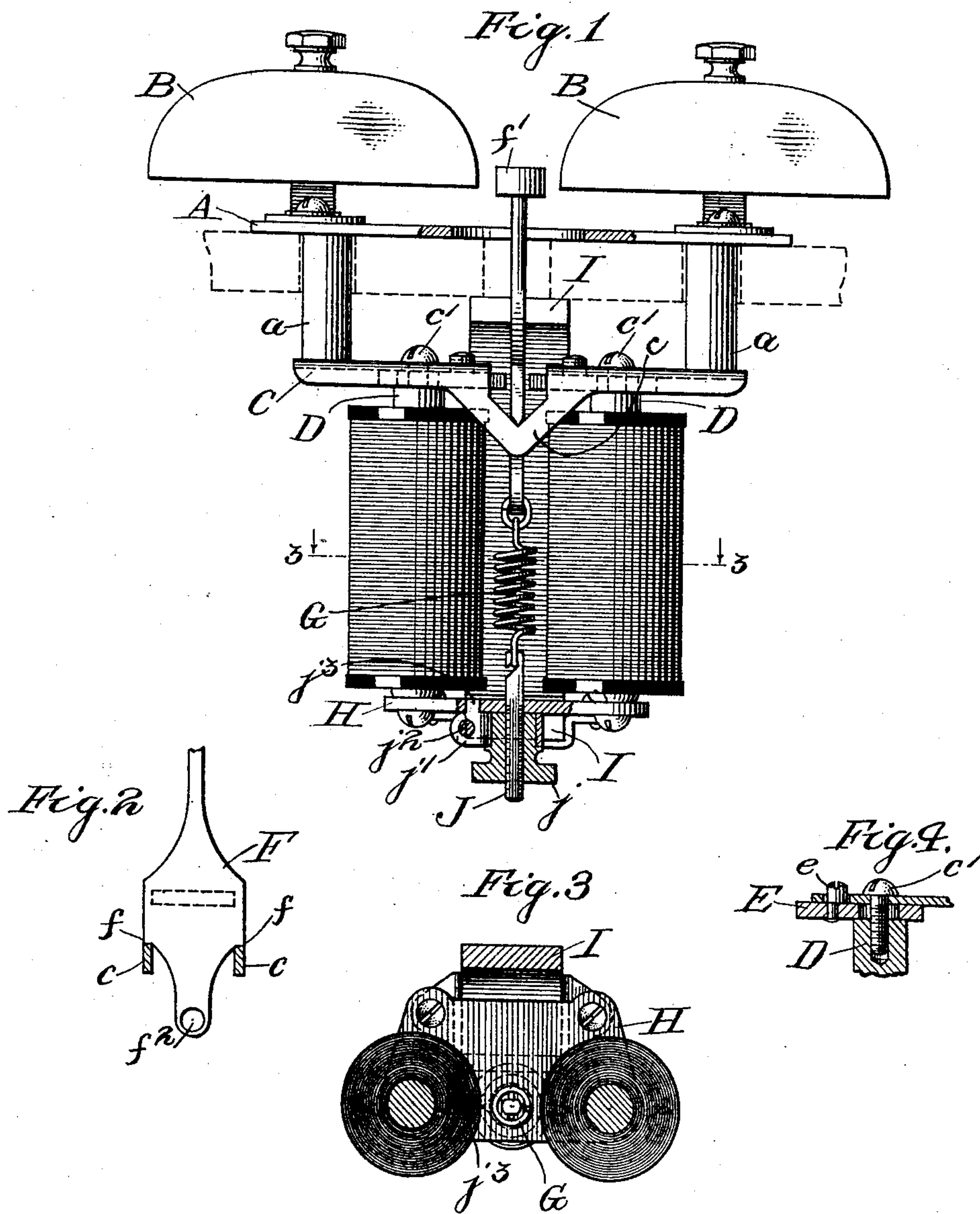


J. ERICKSON.
HARMONIC RINGER.
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1,118,925.

Patented Dec. 1, 1914.



Witnesses:
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UNITED STATES PATENT OFFICE.

JOHN ERICKSON, OF CHICAGO, ILLINOIS, ASSIGNOR TO AUTOMATIC ELECTRIC COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

HARMONIC RINGER.

1,118,925.

Specification of Letters Patent.

Patented Dec. 1, 1914.

Application filed November 30, 1908. Serial No. 465,021.

To all whom it may concern:

Be it known that I, JOHN ERICKSON, a citizen of the United States of America, and resident of Chicago, Cook county, Illinois, have invented a certain new and useful Improvement in Harmonic Ringers, of which the following is a specification.

My invention relates to polarized ringers of the kind used more especially for selective or harmonic ringing on party-lines in telephone systems.

Objects of my invention are the provision of improved means for mounting the vibratory armature and striker; the provision of improved means for holding the said striker under spring tension; the provision of improved means for adjusting the vibratory period of said striker—that is to say, for tuning the same to respond to a certain frequency of current; the provision of an improved arrangement whereby flat springs and certain other features heretofore employed are not necessary; the provision of improved means for adjusting the pole-pieces of the ringer; and the provision of certain details and features of improvement and combinations tending to increase the efficiency of a ringer of this particular character.

To the foregoing and other useful ends, my invention consists in matters hereinafter set forth and claimed.

In the accompanying drawings Figure 1 is a front elevation of an electric ringer embodying the principles of my invention. Fig. 2 is a detail view illustrating the method of mounting the armature of the ringer. Fig. 3 is a horizontal section on line 3—3 in Fig. 1. Fig. 4 is a detail sectional view illustrating the method of adjustably mounting the pole-pieces of the ringer.

As thus illustrated, my invention comprises an upper bracket-plate A upon which are mounted the gongs B, the said plate being adapted to be secured upon the box or casing of a telephone, or upon any other support. Posts *a* are secured to the said bracket-plate, and to the lower ends of these posts there is secured an armature mounting C which is preferably of brass or other diamagnetic material. The said mounting

C is provided at front and rear with depending portions *c*, and its upper flat portions are secured by screws *c'* to the upper ends of the magnet cores D. Between the said mounting C and the upper ends of the magnet cores there are clamped the pole-pieces E, the same being held in place by the said screws, and also by means of the rotatable cams or eccentric pins *e*, as shown more clearly in Fig. 4. When the screws *c'* are loosened, then these cams or eccentrics *e*, which have their larger diameters adapted to rotate in round openings in the mounting C, may be rotated to cause the two pole-pieces E to move toward or away from each other, it being observed that this gives a very delicate and nice adjustment. The opening in the pole-piece E which is engaged by the smaller diameter of the cam *e* is in the form of a transverse slot, so as to allow this pin to have a lateral motion with respect to the pole-piece. The pole-pieces E are prevented from moving sidewise by the overturned edges of the mounting C. The armature F is provided with knife edges *f* which rest in V-shaped notches in the portions *c*, and the upper end of said armature is provided with a striker *f'*, which latter is disposed between the two gongs. The lower end of said armature is provided with an eye *f*² to which is attached the upper end of a coil spring G, as illustrated.

The lower ends of the magnet coils are connected together by a yoke H of paramagnetic material, and to this yoke is attached the lower end of a permanent magnet I, whereby the upper pole-pieces of the magnet are polarized in the well-known manner. A screw J extends upwardly through the central portion of the yoke H, and has its upper end provided with a hook to which is fastened the lower end of the spring G, as shown more clearly in Fig. 1. A thumb-nut *j* is applied to the said screw and adapted to bear upon the under surface of the yoke H, whereby the tension of the spring G may be regulated at will, as by rotating the nut *j* one way or the other. A split collar *j'* surrounds the upper cylindric portion of the nut *j*, and is provided with a screw *j*² for clamping the same thereon, whereby the collar and the nut become solid

or rigidly connected. The said collar is also provided with an upwardly projecting lug j^3 adapted to engage a small opening in the yoke H, whereby when the collar is tightened upon the nut the latter cannot then be rotated—that is to say, it will remain in its adjusted position and thus maintain the desired tension on the spring, and the vibration of the ringer armature will not disturb such adjustment.

When an alternating current is passed through the two windings shown on the cores D, the armature F is vibrated in step with the rate of period of alternation of such current, the vibratory period of said armature and striker having been previously determined by proper adjustment of the tension of the spring, in the manner explained. As this is well understood it will not be necessary to explain the manner in which the polarized pole-pieces E are made operative by the alternating current to cause the vibration of the armature disposed between them.

With the foregoing construction and arrangement it will be seen that the ringer has a delicately mounted armature, and that the same is combined with a spring the tension of which can be easily and readily regulated for the purpose of tuning the ringer in accordance with the frequency to which it is desired the same shall respond. The armature and spring and adjusting means are centrally located and occupy but comparatively little space, and are fully protected by the coils at each side thereof, and by the permanent magnet positioned to the rear of the same. The adjustment of the

pole-pieces to produce the desired result is also easily accomplished.

What I claim as my invention is:—

1. In a ringer, a pair of electromagnets provided with polarized pole-pieces, a flat armature disposed between said pole-pieces, a knife-edge for said armature, a portion secured to said pole-pieces against which said knife-edge bears, a coil spring, means for securing one end of said spring to said armature to maintain the knife-edge thereof in place, and means secured to the other end of said spring for adjusting the tension thereof.

2. In a ringer, an armature and a striker carried thereby, said armature provided with a portion having a knife-edge, a stationary portion against which said knife-edge bears, and a coil spring secured to said armature and exerting a pull on the same to hold the knife-edge thereof in place, to keep the armature centered between the pole-pieces of the magnet.

3. In a ringer, an armature, a striker carried by the upper portion of said armature, a spring secured to the lower portion of said armature, and a pair of knife-edges on opposite sides of said armature and intermediate said striker and spring, a stationary part against which said knife-edges rest, said spring operating to hold the armature in place upon said stationary part.

Signed by me at Chicago, Cook county, Illinois, this 25th day of Nov., 1908.

JOHN ERICKSON.

Witnesses:

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EDWARD D. FALES.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."