

No. 633,146.

Patented Sept. 19, 1899.

J. G. NOLEN.

COMBINED GENERATOR AND RINGER FOR TELEPHONES.

(Application filed June 30, 1898.)

(No Model.)

Fig. 1.

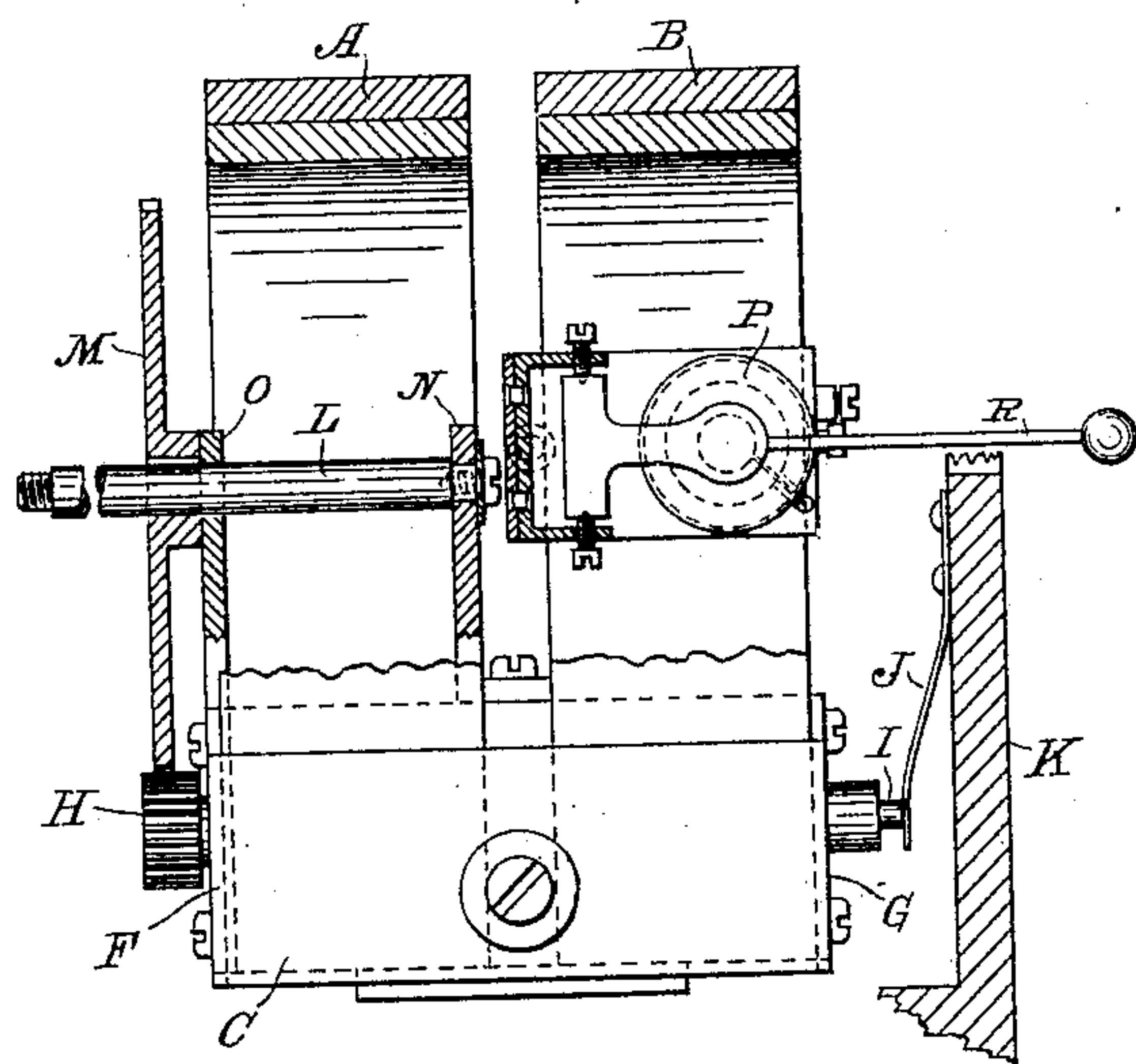


Fig. 2.

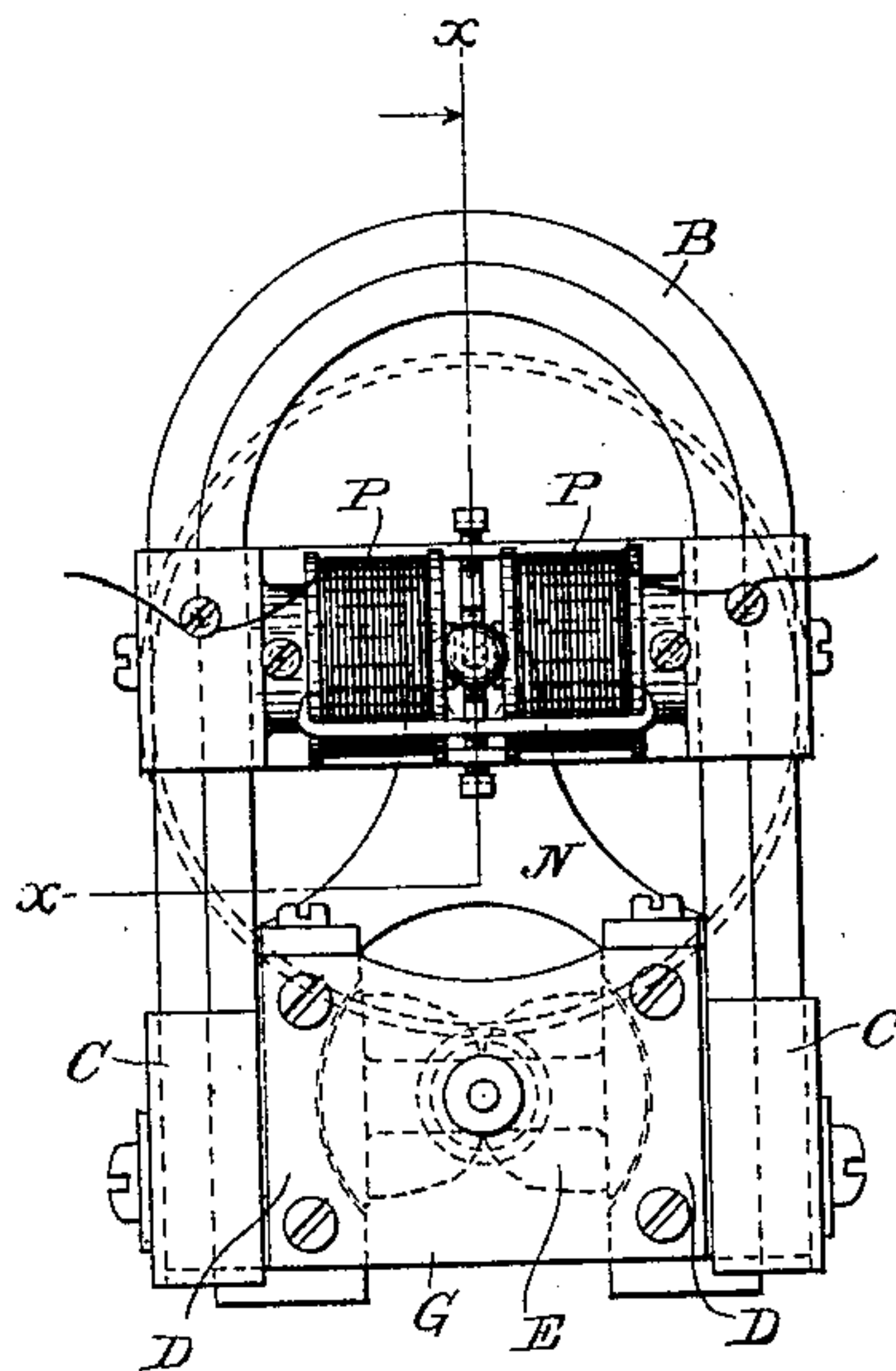


Fig. 4.

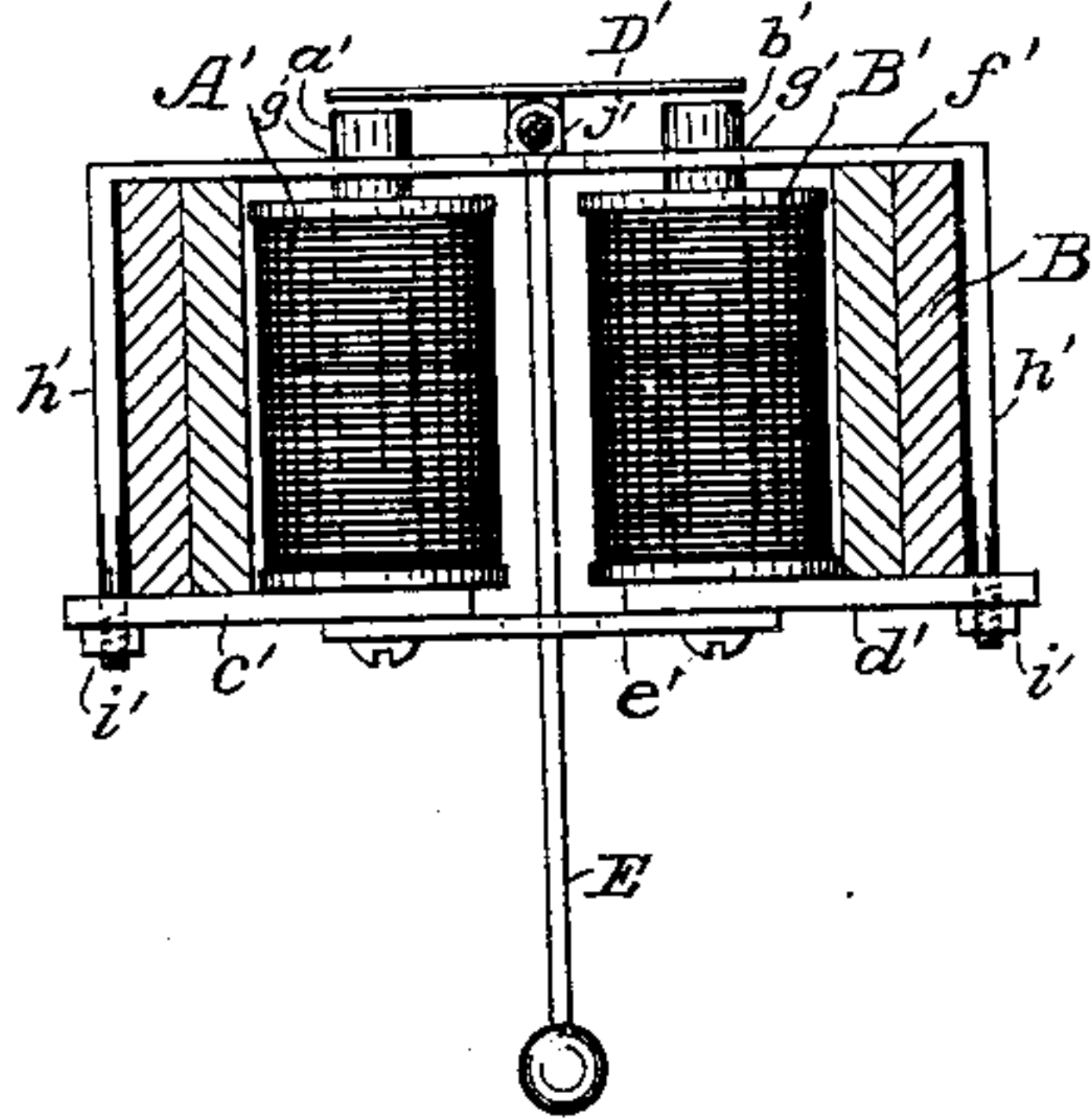


Fig. 3.

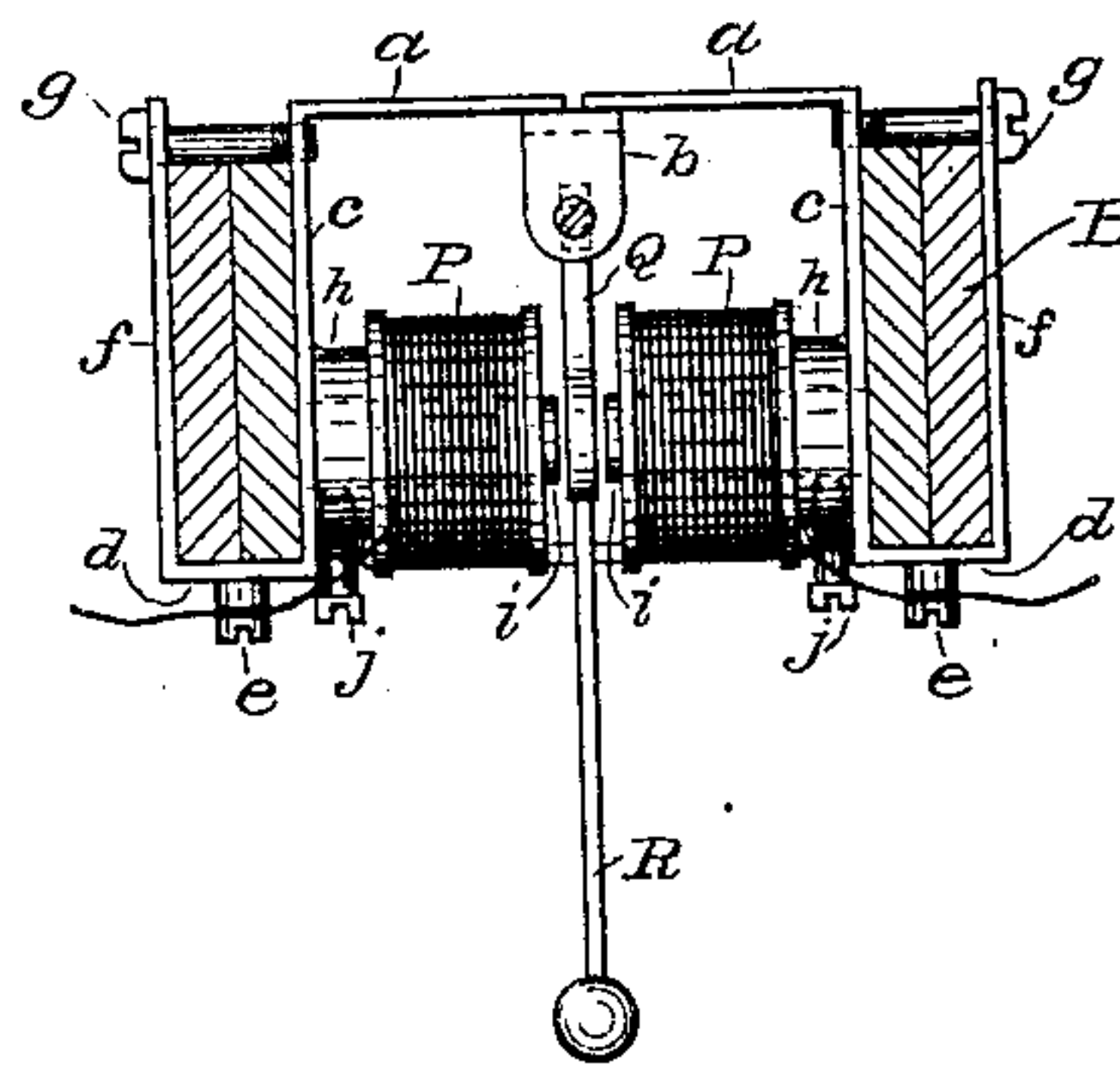
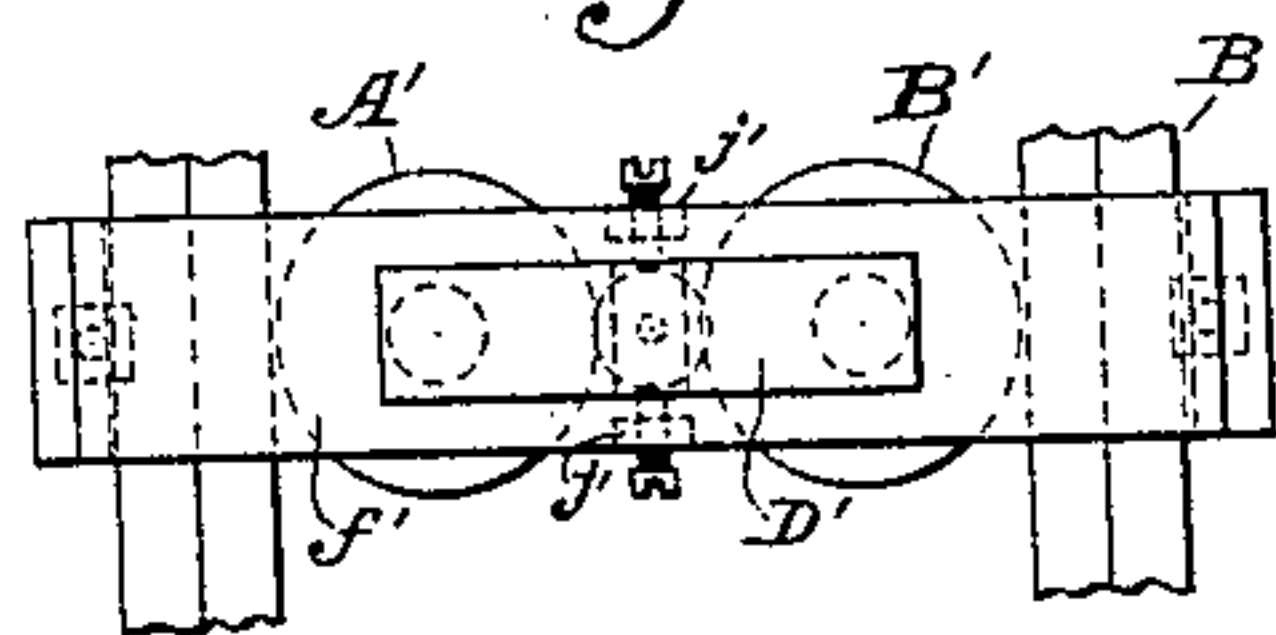


Fig. 5.



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# UNITED STATES PATENT OFFICE.

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## COMBINED GENERATOR AND RINGER FOR TELEPHONES.

SPECIFICATION forming part of Letters Patent No. 633,146, dated September 19, 1899.

Application filed June 30, 1898. Serial No. 684,796. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES G. NOLEN, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in a Combined Generator and Ringer for Telephones, of which the following is a specification, reference being had therein to the accompanying drawings.

10 The invention has reference to new and useful improvements in telephones, and relates particularly to a novel combination of some of the telephone parts, whereby certain beneficial results hereinafter set forth are obtained.

15 One of the essential objects of my invention is to so arrange and combine the generator and ringer mechanisms in an instrument of the type referred to that the usual polarizing-magnet employed for the fields of the ringer mechanism will be entirely dispensed with, together with numerous contacts and connections that heretofore necessarily have been employed.

25 A further object of the invention is to provide means whereby the strength of the polarizing-magnet may be increased or diminished, as occasion may require.

30 With these objects in view my invention consists, broadly, in so combining the generator and ringer mechanisms as to permit of the utilization of the field magnet or magnets of the generator as the polarizing-magnet for the fields of the ringer, whereby a device is obtained the use of which dispenses with the necessity of the usual ringer-magnet and of numerous contacts and connections that have been a necessity in telephone construction.

40 The invention further consists in means for varying the location of the ringer mechanism with respect to the field-magnets of the generator, whereby the strength of the polarizing-magnet may be varied as desired.

45 The invention still further consists in various details of construction, as will be more fully hereinafter set forth and shown in the drawings, in which—

Figure 1 is a section through a telephone-generator, taken on line *x x*, Fig. 2, illustrating the ringer-coils as located between the parallel members or legs of one of the generator-magnets, which is the preferable arrangement. Fig. 2 is an end elevation of my combined generator and ringer. Fig. 3 is a plan view of the ringer mechanism with the top of the generator-magnet removed to more fully illustrate the method of arrangement of the coils. Fig. 4 is a modification of the parts shown in Fig. 3, illustrating the preferable method of securing the coils to the generator-magnet; and Fig. 5 is an end elevation of the mechanism shown in Fig. 4.

In Fig. 1, A and B represent the permanent field-magnets of the generator, the magnets being doubled and of the usual horseshoe type. They are clamped together by means of U-shaped plates C C upon either side of the magnets and carry the usual pole-blocks D D.

E is an armature of ordinary formation, the shaft of which has suitable bearings in the end plates F and G. At one end the armature-shaft carries the gear-wheel H and at the other end the contact-piece I, which is shown to abut against the usual spring J, attached to a portion of the telephone-casing K.

In my improved mechanism the shaft L, carrying the usual gear M, which meshes with the pinion H, extends but half-way through the generator, so as to permit of the location of the field-coils, hereinafter referred to, within one of the generator-magnets. An upright support N, secured to the blocks D D, supports the shaft L at one end, and a similar bracket O, formed, preferably, integral with the end plate F, forms a bearing for the shaft at the other end.

Within the field-magnet B of the generator and between the parallel members or legs thereof I preferably arrange the usual field-coils P of the ringer mechanism in such manner that the cores of the coils will be magnetized by the permanent magnet of the generator acting as a polarizing-magnet. The usual magnet of the type last referred to is thus entirely dispensed with. Means are also



provided whereby the ringer-magnets may be moved to or from the poles of the generator-magnet. The mechanism preferably employed comprises a supporting-bracket, in which the coils are adapted to be carried, so constructed and arranged as to be capable of a vertical adjustment between the legs of one of the generator-magnets. By moving the ringer-magnets in proximity to the magnet-poles of the generator the magnetization of the cores of the ringer-magnets is increased. This result is frequently desired, as permanent magnets in the course of time lose to some extent their magnetic strength.

In one style of construction the supporting-bracket just referred to is in the form of an inverted U, comprising rear transverse portions *a a*, which are connected by a brass yoke *b*, side pieces *c c*, which are adapted to bear against the inner faces of the generator-magnet, front portions *d d*, in which are arranged binding-posts *e e*, and rearwardly-extending arms *f f*, which abut against the outer faces of the parallel members of the generator and are adapted to be clamped to the legs of the field-magnet by means of the screws *g g*. The side pieces *c c* carry at their forward ends hubs *h h*, which are bored, as shown by the dotted lines in Fig. 3, to receive the cores *i i*. The cores just referred to extend through the hubs and through apertures formed for the same in the side plates *c c*, as shown by the dotted lines, so as to form a contact with the inner portions of the generator-magnet. The cores are held in proper position by means of set-screws *j j* in the hubs. Upon the cores are arranged the field-coils *P* of the ringer mechanism, the coils being wound in the usual manner and the ends of said coils being secured to the binding-posts *e e*.

The letter *Q* designates the usual armature, pivotally supported in the yoke *b*, which extends between the coils and carries the striker *R*.

In Figs. 4 and 5 a modified type of securing mechanism for the field-coils of the ringer mechanism is shown, which type is on account of its simplicity preferable in use, as it can be readily attached to the field-magnet of the generator. In the modification the ringer-coils are arranged within the field-magnet of the generator in such manner that the cores of the coils are parallel with the legs of the magnet instead of being at right angles thereto, as in Fig. 3. By this arrangement longer coils may be employed and superior results obtained. The letters *A' B'* designate the modified form of ringer-coils arranged between the legs of the magnet *B*, the cores *a'* and *b'* of which are arranged parallel to the parallel members of said magnet. The front ends of the cores referred to are provided with transverse portions *c'* and *d'*, which are preferably integral with the cores and adapted to

be in contact with and to be clamped tightly against the legs of the generator-magnet. A brass cross-piece *e'* connects the transverse members. The rear portions of the coils referred to are supported by means of a transverse rod or strap *f'*, said strap being apertured at *g' g'* to permit the rear portions of the cores *a'* and *b'* to extend therethrough. The strap is further provided with forwardly-extending arms *h' h'*, which project beyond the legs of the magnet and extend through apertures formed for the same in the transverse portions *c' d'* of the cores. The arms just described are threaded at their free ends to receive clamping-nuts *i' i'*, by means of which the coils are tightly clamped in their proper position between the legs of the field-magnet of the generator. *D'* represents a transversely-arranged armature which is pivotally supported upon a lug *j'* upon the strap *f'*. Slots are formed in the strap referred to and in the brass connecting-bar *e'*, through which extends the clapper or striker *E*, which in turn is secured to the armature.

It is to be observed that while I have shown and described two methods of combining the generator and ringer mechanisms I do not desire to be limited to the exact construction shown, as other methods may be adopted without departing from the spirit of my invention, which consists in so combining the ringer mechanism of a telephone with the usual telephone-generator that the field-magnets of the latter will be utilized as the polarizing-magnet for the former, whereby, as before set forth, numerous parts which have heretofore been found necessary in the construction of telephones are entirely dispensed with and superior results are obtained. It will likewise be observed that by housing the ringer mechanism within the generator field-magnets an increase in the magnetic inertia or retardation of the ringer-coils will be obtained through the presence of the large quantity of iron and steel in the generator. This result is very desirable in high-wound and bridge work, as in working telephones in multiple or bridge it is important that besides a high resistance a high coefficient of self-induction should also be obtained in the coils to prevent the voice-currents from leaking through on the bridge-circuits.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. A combined generator and ringer for telephones, comprising a signal-current generator provided with one or more field-magnets, a supporting-frame adjustably secured to one of said magnets, a ringer mechanism, the field-magnets of which are arranged within the supporting-bracket, and connections between the ringer-magnets and the legs of one of the generator-magnets, substantially as described.

2. A combined generator and ringer for tele-  
phones, comprising a signal-current genera-  
tor, provided with one or more field-magnets,  
a supporting-frame arranged between the legs  
5 of one of said magnets and adjustably secured  
thereto, a ringer mechanism, the field-mag-  
nets of which are arranged between the sup-  
porting-bracket, and connections between the  
cores of the ringer-magnets and the legs of

one of the generator-magnets, substantially as  
described.

In testimony whereof I affix my signature  
in presence of two witnesses.

JAMES G. NOLEN.

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