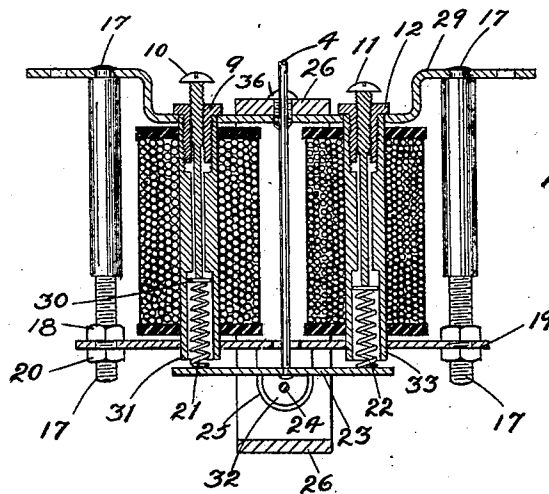
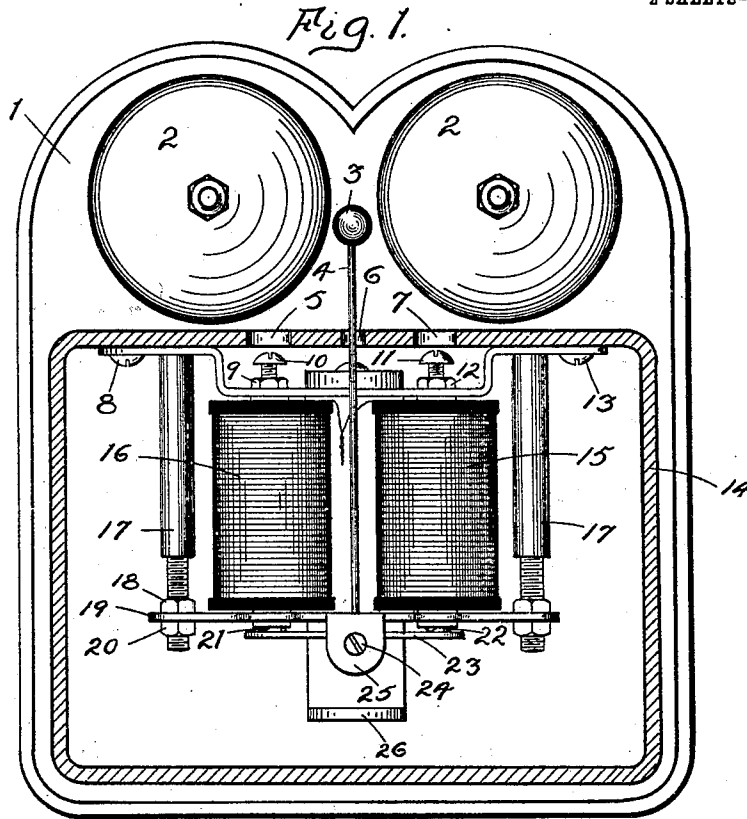


N. P. JENSEN.
TELEPHONE RINGER.
APPLICATION FILED JAN. 9, 1909.

935,792.

Patented Oct. 5, 1909.

2 SHEETS—SHEET 1.



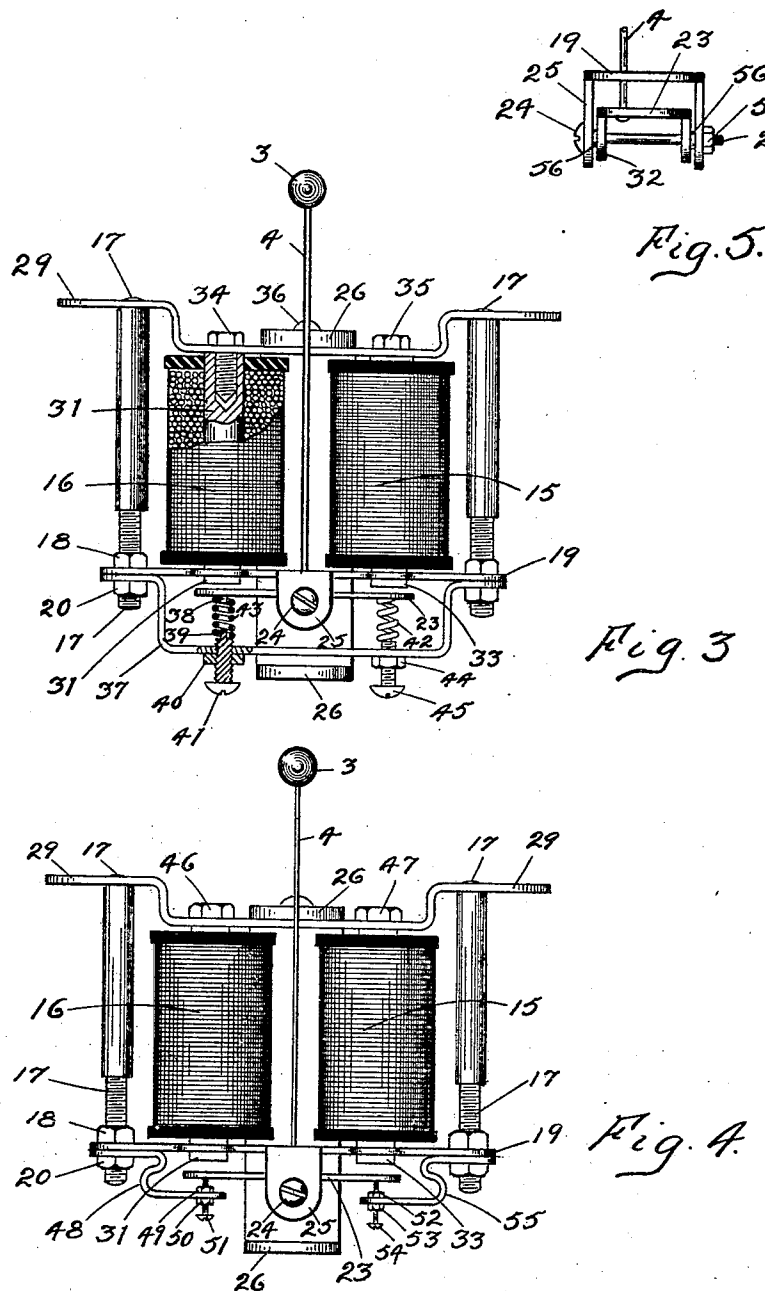
WITNESSES:
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Art. C. Jamieson

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UNITED STATES PATENT OFFICE.

NELS P. JENSEN, OF WATERLOO, IOWA.

TELEPHONE-RINGER.

935,792.

Specification of Letters Patent.

Patented Oct. 5, 1909.

Application filed January 9, 1909. Serial No. 471,392.

To all whom it may concern:

Be it known that I, NELS P. JENSEN, a citizen of the United States of America, and a resident of Waterloo, Blackhawk county, Iowa, have invented certain new and useful Improvements in Telephone-Ringers, of which the following is a specification.

My invention relates to improvements in telephone ringers, and the object of my invention is to provide adjustable resilient means for keeping the ends of the armature spaced a desired distance from the poles of an electro-magnet. This object I have accomplished by the means which are herein-after fully described and claimed, and which are illustrated in the accompanying drawings, in which:

Figure 1 is an upper plan view of a telephone ringer equipped with my improved adjustable resilient means for spacing the armature away a desired distance from the poles of the electro-magnet. Fig. 2 is a sectional view of the device shown in Fig. 1, taken horizontally through the axes of the coils of the electro-magnet. Fig. 3 is a plan view, partly broken away, of a slightly varied form of adjustable resilient means to effect the same purpose. Fig. 4 is a plan view of another slightly varied means for effecting the same purpose. Fig. 5 is a detail view, showing the manner of mounting and pivoting the said armature.

Similar numbers refer to similar parts throughout the several views.

The bells 2 are mounted on a backing 1 outside of the case 14, through a slot 6 of which the rod 4 of the hammer 3 extends and vibrates. The rod 4 projects from the vertical median line of the armature 23, the latter having rearwardly-extending lugs 32 orificed in line to receive pivotally a pivot-bolt 24. The pivot-bolt 24 is passed through aligned orifices in the rearwardly-extending lugs 25 which project from the transverse plate 19, and is secured by a nut 57, the lugs 32 and 25 being spaced apart by washers 56. An electro-magnet of the usual type is mounted in said case, and is composed of the coils 15 and 16 wound in opposite directions, connected, and adapted to receive the usual alternating-current. The ends of the cores 33 and 31 of said coils respectively are mounted in seats in the transverse plates 29 and 19. The ends of said plates are connected by the spacing-posts 17, the rear ends of which are threaded to receive the adjust-

ing-nuts 18, and 20. The transverse bar or yoke 19 is orificed to permit the passage therethrough and vibration of the rod 4.

Secured to the bar 29 by a screw 36 is the permanent magnet 26 bent in the usual manner to act by induction to give the core-ends 31 and 33 opposite polarities. The plate 29 is secured to the case 14 by screws 8 and 13. The cores 31 and 33 are axially bored from their opposite ends for a portion of their length, the bore being relatively large, and the central portion of the cores is bored axially through to permit communication between the end bores, with a bore of a relatively small diameter. In the rear bores are seated coiled compression-springs 21 and 22 respectively which bear against the adjacent ends of the armature 23. The forward bores are interiorly threaded to receive the hollow screws 9 and 12 respectively, and adjusting-screws 10 and 11 work respectively through the interiorly-threaded axial hollows of the screws 9 and 12. The screws 10 and 11 have spindles which pass through the central bores of the cores and bear against movable disks 30 in contact with the forward ends of the springs 21 and 22. The springs 21 and 22 bear against the adjacent ends of the armature 23, to resiliently space them away from their adjacent pole-ends 31 and 33. In order to keep the tension of said springs equal, and in order to adjust the springs to vary their tension to act properly on the armature in the event that the frequency of alternations of the current is changed, the screws 10 and 11 may be moved either in or out a proper distance in their seats, orifices 5 and 7 being provided in the case 14 through which a screw-driver may be inserted. If a high frequency current is being used, the tension of the springs should be increased.

In Figs. 3 and 4 are shown plan views of ringers which embody the principle of my invention, in a slightly variant but equivalent form. In Fig. 3, an equivalent tension is produced on each end of the armature 23 by means of contacting spiral springs 42 and 43, the latter seated over studs 38 projecting from the armature. Adjusting-screws 45 and 41 are engaged with the springs 42 and 43 respectively, and work through the nuts 44 and 40 respectively and through the yoke 37, the ends of the latter being secured to the ends of the yoke 19 by the posts 17 and nuts 20.

In Fig. 4 is shown a ringer which has a flat spring on each side, at 48 and 55, instead of the coiled springs 38 and 42 shown in Fig. 3. The springs 48 and 55 are secured to the posts 17 in a similar way by the nuts 20, to the manner in which the ends of the yoke 37 are secured in the construction shown in Fig. 3. To adjust the tension of the flat springs 48 and 55, adjusting screws are movable through them, as shown at 51 and 54 respectively, said screws having locking-nuts 49 and 50, and 52 and 53 respectively. The ends of the screws 48 and 55 bear against the adjacent ends of the armature 23. In the ringers shown in Figs. 3 and 4, the cores 31 and 33 are secured to the yoke 29 by screws 34 and 35 respectively.

My invention, that of applying an adjustable tension to resilient means engaging each end of the pivoted armature, effectively allows of change when necessary, to overcome variations in the power of the said means, or to vary the tension as desired to act against currents of greater or less frequency of alternations.

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

1. The combination of a magnet, a rocking armature, magnetic mechanism including an electromagnet for actuating said ar-

mature, the cores of said electromagnet being hollow, and resilient means in the hollows of said cores adapted to independently engage the adjacent ends of said armature. 35

2. The combination of a magnet, a rocking armature, magnetic mechanism including an electromagnet for actuating said armature, the cores of said electromagnet being hollow, resilient means in the hollows of said cores adapted to independently engage the adjacent ends of said armature, and means for independently adjusting the tension of each of said independent resilient means. 40 45

3. The combination of a magnet, a rocking armature, magnetic mechanism including an electromagnet for actuating said armature, each of the cores of said electromagnet having an axial hollow, a compression-spring seated in the hollow of each core adapted to bear against the adjacent end of said armature, and an adjusting-screw seated in each core adapted to engage and vary the resilience of the adjacent compression-spring. 50 55

Signed at Waterloo, Iowa, this 21st day of Dec. 1908.

NELS P. JENSEN.

Witnesses:

O. D. YOUNG,
G. C. KENNEDY.