

UNITED STATES PATENT OFFICE.

BUTLER AMES, OF LOWELL, MASSACHUSETTS.

ARMATURE-SPRING.

1,140,432.

Specification of Letters Patent.

Patented May 25, 1915.

Application filed May 21, 1913. Serial No. 769,043.

To all whom it may concern:

Be it known that I, BUTLER AMES, a citizen of the United States, residing at Lowell, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Armature-Springs, of which the following is a specification.

This invention relates to current interrupters used in connection with induction coils and especially with such as are known as spark coils.

It comprises an improved form of armature which combines the armature and armature spring. This I will call a spring armature.

Figure 1 is a plan view from the top of my device on a coil. Fig. 2 is a plan view from the bottom of the top nonconducting plate. Fig. 3 is an enlarged sectional side elevation. Fig. 4 is an end elevation from the bottom of Fig. 1. Fig. 5 is a plan view of my spring armature. Fig. 6 shows a modified form of spring armature.

A suitable case M incloses the usual core N, primary and secondary windings, condenser and proper electrical connections. Upon the top of the case M and insulated therefrom by a non-conducting plate B, is the top metal plate A to which the members of my device are attached. There is an opening 16 opposite core N in plate A.

C is a metallic bridge plate with a projecting wing 10 from which depends a contact tip 11 which is preferably a plug of platinum. The bridge plate is insulated by means of collars 12, 13 and is attached to the top plate by means of posts 14 and nuts 15.

The spring armature plate D is stamped from one piece of sheet metal preferably spring steel and has the ears 20 and 21 by which through the medium of screws 22, 23 it is attached to bosses 30 on the top metal plate A as shown. These ears 20 and 21 extend back from the middle or body portion 24 so that an elastic action is permitted and so that the plate instead of being held too rigidly between the bosses 30 and 30, and the heads of screws 22 and 23, will be held normally about parallel with top plate A but can be forced up or down if desired, the elastic ears giving way to superior pressure. A tail 25 which may be bent upward and back as shown in Fig. 3 or straight as shown in

Fig. 6 extends from between the ears and is bifurcated at the end so as to form arms 26 and 27. I prefer to cut a slot 28 in the adjusting or rising portion of this tail so as to reduce its stiffness and make it more flexible.

The other end, which I will call the front, of the body portion 24 of plate D which adjoins the contact plate C is split by means of slots 40 and 41 into three leaves 42, 43, 45. At its top, the middle leaf 43 preferably at some distance from its end carries a contact tip 44 which is preferably a plug of platinum and is so located as to engage the contact tip 11 on the wing 10 of bridge plate C. Plate D should be so located that the center of core N will be very close to the middle point between the inner ends of slots 40 and 41 which is also about the middle of the body portion 24. By splitting the plate D, there is a drag on the middle leaf which makes a longer make and a shorter break than where any other construction is used. The break comes suddenly like the snap of a whip which is very desirable.

It will be observed that my spring armature extends on one side of its pivot portion with a sufficient expanse of metal to serve the purpose of an armature and on the other side as a tail which I use for adjusting.

I prefer to use the type of adjusting post shown in the drawing and upon which I have applied for United States Letters Patent of even date herewith, filed May 21, 1913, Serial Number 769,045 entitled Adjusting post, but I may use any other adjusting means desired. The lock screw 61 is fixed in any desired manner to top plate A and carries an adjusting nut F which has a knurled rim 50 by which it may be turned and an annular slot 51 on each side of which extend the arms 26 and 27. By turning this adjusting nut up or down the tension on tail 25 may be varied and thereby the tension on the body 24 and the tip 44.

I am well aware that vibrators have been constructed with a block of metal attached to one end of a spring the other end of which is fastened to the top plate and that between these an adjusting nut has been located to increase or decrease the tension. My construction, however, is much more compact and durable and much less likely to get out of order or out of adjustment for

the reason that my spring armature lies flat and substantially parallel with the top plate and at a very short distance therefrom. The ears by which it is attached through the medium of screws through the top plate act as an elastic pivot while the body of the spring armature covers the entire end of the core and the opening therefor. By splitting the plate in the way shown, the middle leaf has a reduced tension and as the pull of the core is applied near the base thereof, the inertia of the parts causes the tip of this middle leaf to lag behind. Moreover the tension on the tail 25 causes tip 44 to press against tip 11, but of course it can not pass it, while the same tension causes side leaves 42 and 45 to rise above middle leaf 43. Therefore when attracted by the core, they have a longer distance to move down and back than the middle leaf. The middle leaf has a sort of pendulum action. The tail upon which the adjusting nut bears lies only a short distance above the top plate and engages the adjusting nut in such manner that the movements of the nut are transmitted in the manner of a see-saw to the middle of the body of the spring armature.

By the use of a spring armature instead of an armature spring with a block, the device is much more sensitive and much more responsive to the adjustment.

In adjusting, the pressure on tail 25 works

against the normal tension on the elastic ears and so on body 24 and middle leaf 43.

What I claim as my invention and desire to cover by Letters Patent, is:

1. A spring armature formed from one piece of sheet metal and which comprises a body portion, three leaves forming the front thereof, two ears at the back thereof, and a tail which extends backward between said ears.

2. The combination in a spark coil having a core and a top plate with an opening opposite the core, of a bridge with a wing and a contact tip, an adjusting nut, and a spring armature the body portion of which extends over the opening for the core between the adjusting nut and bridge said spring armature being formed of sheet metal and elastically attached behind its body portion to the top plate and having a tail at the back which engages the adjusting nut said body portion on the front being split into three leaves the middle leaf having a contact tip which engages the contact tip on the wing as described.

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

BUTLER AMES.

Witnesses:

JOHN C. McKENNA,
FRANCES G. KANE.