Dec. 18, 1928. 1,695,708

E. BUGATTI

CONTACT DEVICE FOR MAGNETOS

Filed Jan. 8, 1925 3 Sheets-Sheet 1

Fig. 1

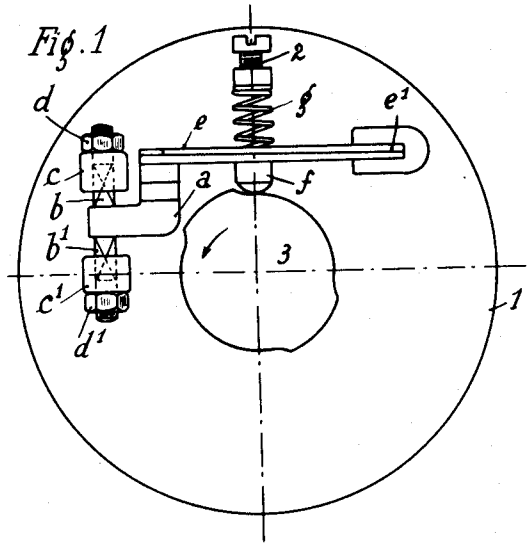


Fig. 2

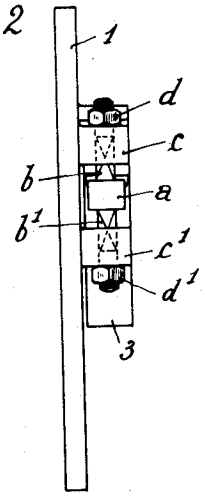


Fig. 7

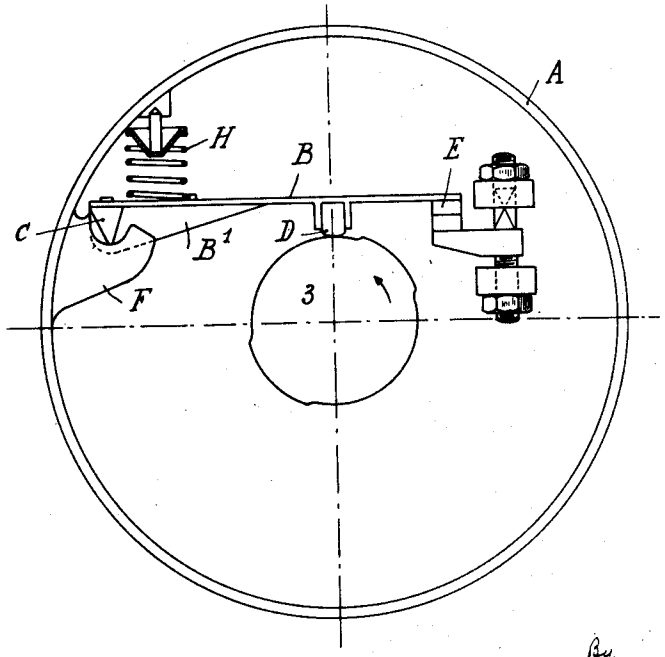
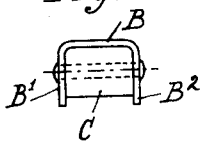


Fig. 8



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Dec. 18, 1928. 1,695,708

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CONTACT DEVICE FOR MAGNETOS

Filed Jan. 8, 1925 3 Sheets-Sheet 2

Fig. 3

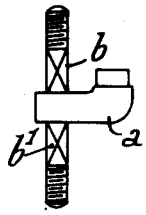


Fig. 4



Fig. 5

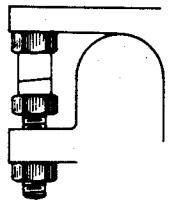


Fig. 6

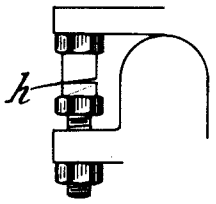
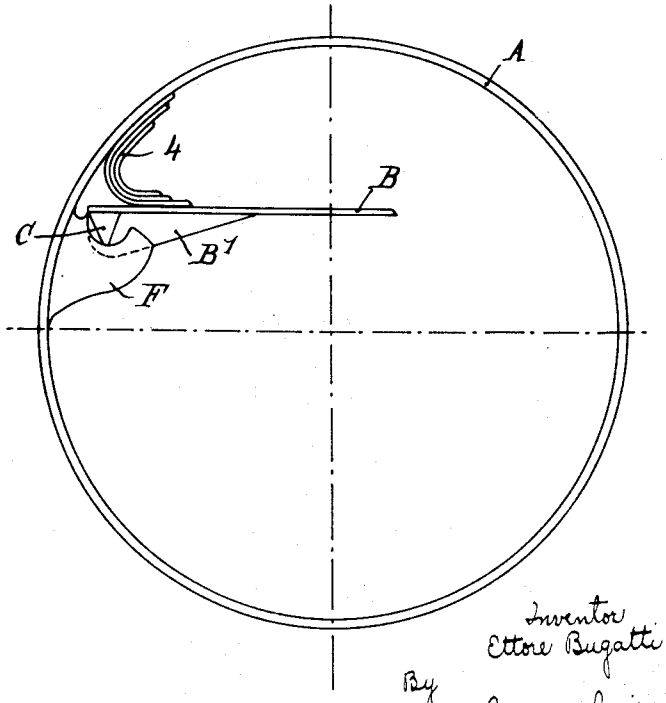


Fig. 9.



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Dec. 18, 1928. 1,695,708

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CONTACT DEVICE FOR MAGNETOS

Filed Jan. 8, 1925 3 Sheets-Sheet 3

Fig. 14

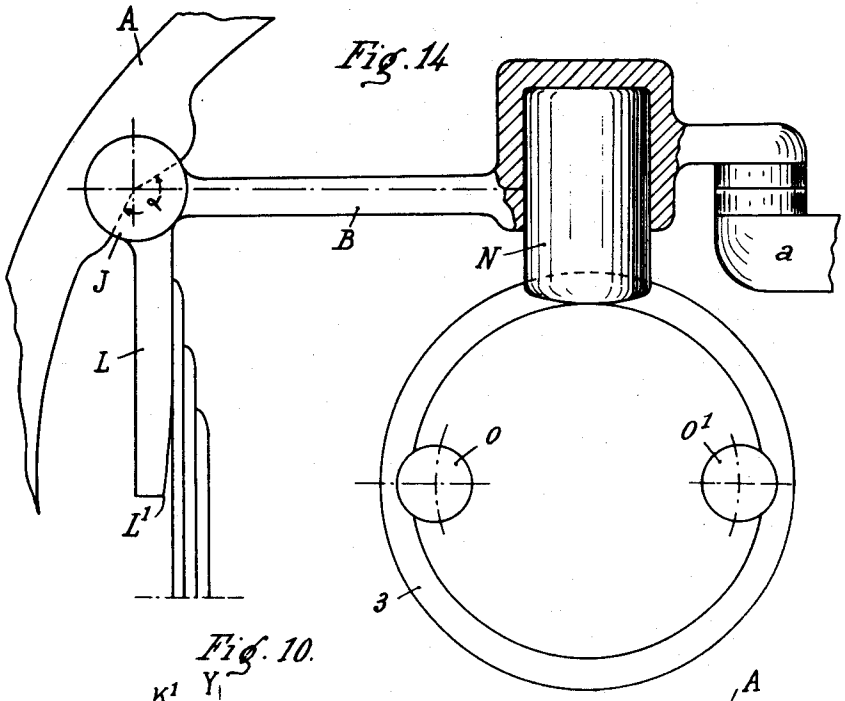


Fig. 10.

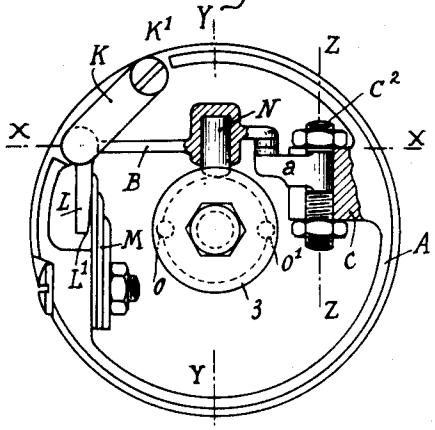


Fig. 12

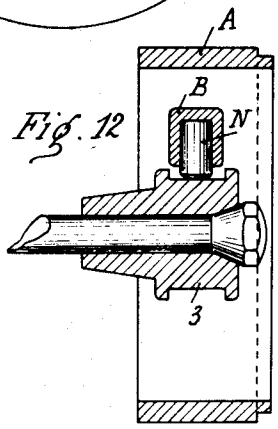


Fig. 11

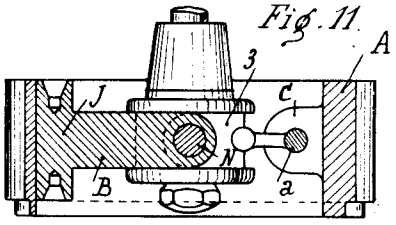
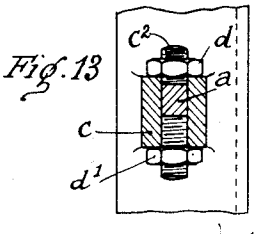


Fig. 13



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UNITED STATES PATENT OFFICE.

ETTORE BUGATTI, OF MOLSHEIM, FRANCE.

CONTACT DEVICE FOR MAGNETOS.

Application filed January 8, 1925, Serial No. 1,259, and in France January 19, 1924.

The present invention relates to stationary contact device of the make-and-break type for magnetos.

The contact devices in current use are of the hammer type, and are either stationary or movable. In both cases, the hammer has a considerable weight and thus possesses a certain inertia, so that it is unable to follow the movement of the engine when at high speeds, and the latter is subjected to irregularities in operation by reason of the delay in the break of the primary circuit, so that the current produced in the secondary circuit, is far from attaining the maximum, and a small spark will be the result.

Another drawback is found in the adjustment. When the space between the platinum tipped contacts is to be regulated, the contact of the stationary portion is screwed or unscrewed, after releasing the lock nut. Should the contact take place upon a slightly inclined plane and the contact of the fixed portion be turned through half a revolution, the new contact will take place between two points, thus resulting in a rapid wear, and the operation will be irregular.

The present invention affords means for obviating the two inconveniences above mentioned, and it has for its object a contact device of the make-and-break type comprising a contact which is mounted upon the stationary portion and is movable in the parallel (i. e. transverse) direction during the adjustment, the contact of the movable portion being mounted upon a strip which can be raised by the projection of a cam in order to break the primary circuit; said strip is applied against the contact pertaining to the stationary portion by means of a suitable spring, and is fitted into an adequate member at the rear end, or it otherwise terminates in a knife edge forming a fulcrum and held in contact with a suitable support by means of the said spring.

In a modification, the support for the platinum tipped contact pertaining to the stationary portion is slidable without rotation in a slot provided in a suitable support. The platinum tipped contact pertaining to the movable portion is mounted upon a lever provided with an auxiliary arm upon which a plate spring is caused to bear, the face in contact with the said spring being so formed that according as the said contact becomes worn down, the lever on co-operating with the spring will become increased.

The following description with reference to the appended drawing which is given by way of example, sets forth the present invention.

Fig. 1 is a plan view of the stationary contact device according to the invention and

Fig. 2 a side elevation.

Figs. 3 and 4 are respectively elevational and plan views of the platinum tipped contact pertaining to the stationary portion.

Figs. 5 and 6 show the contacts of the platinum tipped screws in the known devices.

Fig. 7 is a modification of the contact device according to the invention.

Fig. 8 is an end view of the lever shown in Fig. 7.

Fig. 9 is a modification relative to the maintenance of the said lever in its recess.

Fig. 10 is a plan view of a modification of the magneto contact device.

Fig. 11 is a section on the line X—X.

Fig. 12 is a section on the line Y—Y, and

Fig. 13 is a section on the line Z—Z of Fig. 10.

Fig. 14 is a view on a larger scale of the arm carrying the movable platinum tipped contact.

The stationary contact, Fig. 3, consists of a member a secured to two symmetrically disposed arms b b^1 having a square section for a certain length and ending in a screwthreaded portion. The said arms are respectively slidable in the bosses c and c^1, Fig. 1, which are formed in one with the disc or frame of the contact device 1; the nuts d and d^1 serve to regulate the space between the contacts.

The movable contact, Figs. 1 and 2, is maintained by a very light double spring strip e to which is secured a stud f made of insulation such as fibre, gutta percha or the like which serves to separate the said contacts and thus to break the primary circuit when raised by the projections of the cam 3. The said spring is rigidly secured at the other end e^1 to the disc 1 of the said contact device.

A reaction spring g which is subject to compression abuts at one end upon the spring strip e supporting the said movable contact, and at the other end upon the adjustable stop screw 2 whose rotation in either direction pro-

vides for the increase or diminution of the force of the spring g, i. e. of the speed of the return of the movable contact, thus enabling the adjustment of the contact device for all speeds of the engine.

In order to regulate the movement of the said platinum tipped contacts, if for instance the movement is to be diminished, the nut d^1 is slightly unscrewed, and the nut d is tightened by the same amount. This operation is continued until the proper degree of movement has been obtained. Since the movable contact can only be given a motion of translation, i. e., said contact can only be moved rectilinearly. After adjustment the contact surface will be in the same condition as before, this being impossible to obtain with the known types of movable platinum tipped screws. In fact, in the case of the latter screws, Figs. 5 and 6, if the lower screws are given half a turn in order to bring it from the position shown in Fig. 5 to the position shown in Fig. 6, it is observed that in the latter position the contact will take place only at the point h thus occasioning a rapid wear of the contact surfaces, and a continual adjustment must be made; such drawbacks are however obviated by the contact device according to the invention.

Fig. 7 shows a modification of the said device, wherein the lever B consists of a light sheet metal and has secured thereto the knife edge C, the fibre stud D and the platinum tipped contact E.

In order to maintain the said knife edge in its recess F, so as to afford a fulcrum for the lever B, a spiral spring H is disposed between the lever B and the casing or frame of the device; the spring may have any other suitable shape without departing from the invention. The stationary platinum tipped contact is mounted as above set forth. The said lever is laterally guided by the two cheeks B^1 B^2, Fig. 8, which oscillate at either side of the projection F.

In order to break the primary current circuit of the magneto armature, one, two, or a greater number of bosses are provided upon the cam 3, according to the construction of the magneto, said bosses acting during the rotation of the cam to effect the displacement of the movable platinum tipped contact and hence the rupture of the primary circuit.

Fig. 9 shows an arrangement for maintaining the knife edge of the lever in its recess, by means of a plate spring 4.

The advantage offered by the said contact device consists in the fact that the element in motion is of a very light construction and hence it possesses but a very small inertia, so that the armature can be rotated at high speed, the movable platinum pointed contact entering rapidly into contact with the fixed platinum pointed contact.

In the modification shown in Figs. 10 to 14, the stationary platinum tipped contact a, or rather the member carrying the same, is slidable in a slot provided in the support c, Fig. 13, and is integral with the screw c^2. The contact a is always displaced by a parallel or transverse movement, according to the feature set forth in the main patent.

The movable platinum tipped contact is mounted upon the lever B whose fulcrum consists of the cylinder J engaged in a corresponding recess in the casing A of the device. The said recess is open at an obtuse angle α and not upon a diametrical plane. In this manner when the cylinder J is inserted endwise into the said recess it will be unable to escape vertically when in position. It may further be maintained at the end by a covering plate K which is pivoted at K^1 to the said casing.

The lever B is integral with an arm L cooperating with the plate spring M, and the corresponding face of the said arm has the form of an inclined plane or of a cylinder of large radius, for example, as shown in Fig. 14, so that when the lever B is raised, the point on the said arm which co-operates with the spring will become farther removed from the pivoting axis of the lever B, and the lever arm of L will thus increase and the effect of the said spring will be progressively augmented, the point L^1 entering into contact with the spring only when the lever B is raised to the maximum. In the inverse direction, the effect of the spring will decrease progressively, and the said contacts will enter into contact with each other at a very slight pressure, thus obviating the rapid wear of said contacts.

The fibre cylinder or stud N is inserted endwise into a cylindrical recess in the lever B, and thus operates in the most favourable conditions, the piece being cut in the direction perpendicular to the fibres, so that the wear is a minimum. The cam 3 provided with the projections has also been modified, and consists of a cylindrical portion which is pierced with two, four or a greater number of apertures, according to the method of construction of the magneto, which are exactly parallel to the axis. Into the said apertures are inserted the steel cylinders O O^1 (rectified after tempering) whose periphery extends above the periphery of the cam cylinder 3 for a suitable length. The primary circuit is broken in virtue of the co-operation of the said cylinders with the stud N.

Obviously, the said arrangement is susceptible of detail modifications without departing from the principles of the said invention.

What I claim is:

A make-and-break device for magnetos comprising a main supporting frame, a stationary contact which is slidable without rotation in a slot in the said frame, a two-arm swinging lever whose fulcrum has a cylin-

drical shape and is engaged in a recess of like shape which is formed in the said main frame, a movable contact disposed at the end of said lever, a cylindrical recess formed in said lever and adapted to receive a fibre cylinder, a spring urging the other arm of the lever, in such manner as to bring the two contacts into contact with each other, and a cam provided with bosses and cooperating with the said fibre cylinder in order to raise the said swinging lever.

In testimony whereof I have signed this specification.

ETTORE BUGATTI.