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W. OCHSENBEIN

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SNAP COUPLING PARTICULARLY FOR MULTIPOLE MAGNETOS

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Fig. 1.

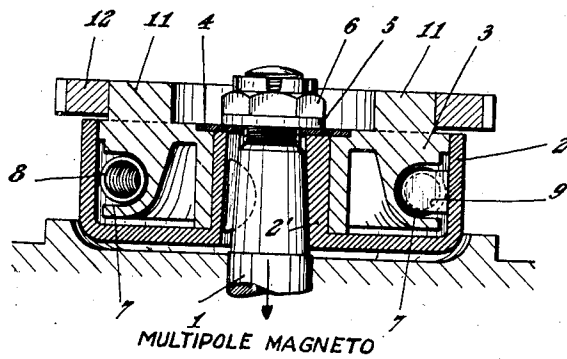
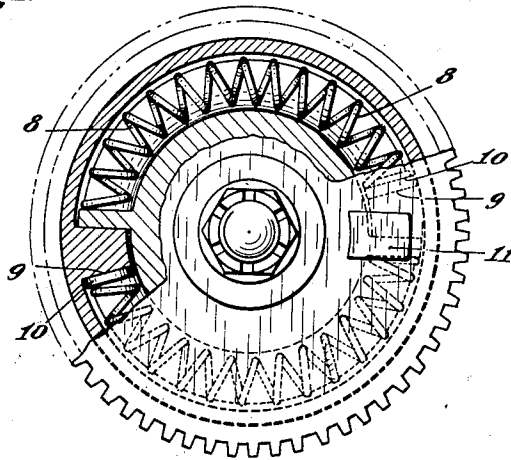


Fig. 2.



Walter Ochsenbein
INVENTOR

BY *W. H. Hunk*
his ATTORNEY.

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SNAP COUPLING, PARTICULARLY FOR
MULTIPOLE MAGNETOS

Walter Ochsenbein, Bern, Switzerland, assignor
to Hasler A.-G. Werke für Telephonie und
Präzisionsmechanik, Bern, Switzerland

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2 Claims. (Cl. 171-209)

The present invention relates to a snap coupling particularly for multipole magnetos in internal combustion engines. Heretofore known couplings of this kind needed pawls for the mutual locking between the rotor and stator of the magneto. When starting the combustion engine the rotor of the magneto was locked by pawls until a spring contained in the coupling was sufficiently tensioned whereupon the pawls were disengaged by a stop and the rotor of the magneto was rotated by the spring power sufficiently fast for generating the first spark which started the combustion engine. When the pawls were disengaged, very often hard shocks were occasioned by the striking of the coupling portion connected with the rotor of the magneto against the coupling portion connected with the starting device, whereby frequently disturbances arose rendering the starting very hard or even impossible.

According to the invention these disadvantages are avoided by a snap-coupling designed particularly for multipole magnetos and this by the fact that the coupling possesses two mutually rotatable portions, one of which is connected to the rotating armature of the magneto and the other to a shaft of the engine in such a manner that, when the last mentioned coupling portion is rotated, the first portion, after overcoming the resistance against rotation exerted by the magnetic field of the magneto on the rotor, disposed in a neutral position between two adjacent poles of the stator, will be rotated by the magnetic torque acting on the rotor at a sufficiently high speed to generate a sparking current. By the suppression of pawls the coupling is considerably simplified and a more reliable operation is obtained.

The annexed drawing represents as an example one embodiment of the invention.

Figure 1 is an axial section through the coupling and

Figure 2 is a partial top view and a partial horizontal section.

A cup-like coupling portion 2 is fastened with its hub 2' to the rotor shaft 1 of a multipole magneto not shown. A second coupling portion 3 is rotatably seated on the cylindrical outer surface of the hub 2'. By means of two washers 4 and 5 and of a nut 6 screwed onto the threaded end of the shaft 1 the coupling portions are kept in place. The coupling portion 3 is provided on its circumference with two substantially semi-circular grooves 7 each enclosing a helical spring 8. From the inside of the rim of the outer coupling portion 2, a projec-

tion 9 extends into each groove and rests with an intermediate elastic buffer 10 against one end of the respective spring 8. Coupling portion 3 has on its upper face two carrier cams 11 by means of which a gear wheel 12 may be coupled which wheel is to be geared to the motor shaft or cam shaft of the combustion engine.

When the engine is cranked up for starting, the coupling portion 3 is rotated at a relatively slow speed which does not suffice to generate a sparking current in the magneto. In multipole magnetos, as is well known, the magnetic field exerts a very strong resistance against the starting of the rotor. Therefore, the rotor and the coupling portion 2 are initially held against rotation by the magnetic field and the springs 8 will be compressed by the rotating portion 3. As soon as the tension of said springs has overcome the starting resistance, the magnetic field exerts a magnetic torque on the rotor the power of which is augmented by the power of the released springs. Thus, the rotary speed of the rotor is increased to such an extent that a sufficiently high tension is obtained for generating the first spark. In addition, the springs 8 have still another function. The torque between the rotor of the magneto and the driving element for the rotor decreases with increasing rotative speed. Therefore, as the speed increases, the springs 8 are less compressed the two coupling portions are less twisted relative to each other and the engine shaft has a smaller forward displacement relative to the rotor shaft in the direction of rotation, which fact can be utilized for an automatic timing of the ignition. By suitably selecting the strength of the springs 8, the ignition may be advanced to a predetermined maximum, as the speed of the engine increases.

On the other hand, the springs 8 may be entirely omitted, for it has been found that, if the resistance produced by the magnetic field is sufficiently strong the magnetic torque applied to the rotor when said resistance has been overcome, suffices to generate a sparking current. The use of springs in the coupling affords, however, a considerably increased security for a rapid starting of the motor.

Of course the described snap coupling could be employed also for two pole magnetos if the magnetic field is strong enough for bestowing on the rotor a sufficiently high initial speed.

What I claim is:

1. A magneto and impulsing device therefor comprising in combination a multipole magneto

having a rotor and a stator, the magnetic torque on the rotor being large enough to permit impulsing thereof, and a snap coupling consisting of a first coupling portion adapted to be driven by a rotary drive element, a second coupling portion secured to the rotor of said magneto, said coupling portions being rotatable with respect to each other, and means to limit the relative rotation of said portions, said limiting means being constructed and arranged to permit a rapid rotation of said second portion relative to said first portion, under the influence of the magnetic torque acting on the rotor of the magneto, from a first position corresponding to a minimum re-

luctance position of the rotor relative to the stator to a second position corresponding to a succeeding minimum reluctance position of the rotor relative to the stator, when said first portion, upon being rotated by said drive element, through said limiting means, displaces said second portion from said first position against the braking force exerted on the rotor by the magnetic field.

2. An arrangement, as claimed in claim 1, in which said limiting means include a shoulder on each of said coupling portions and a compression spring disposed between said shoulders.

WALTER OCHSENBEIN.