H. J. PODLESÁK.

LOW TENSION SPARKING MECHANISM FOR GAS ENGINES.

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1,022,642. Patented Apr. 9, 1912.

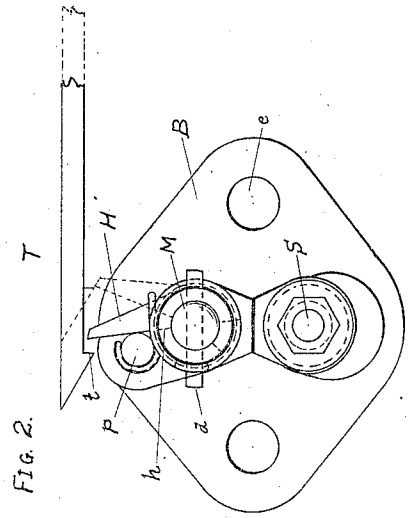

FIG. 2.

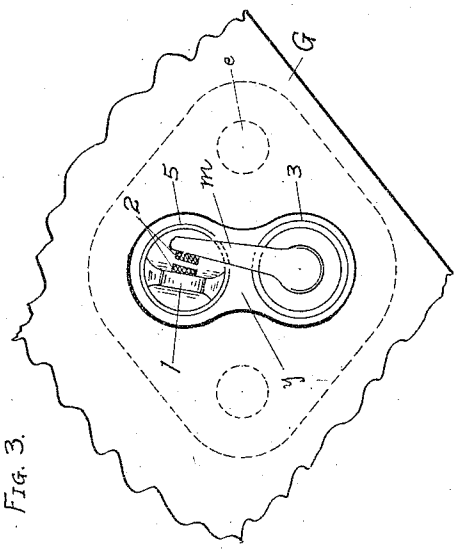

FIG. 3.

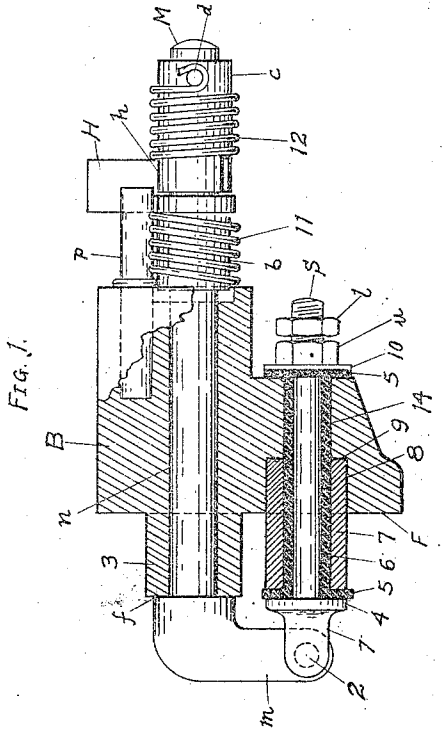

FIG. 1.

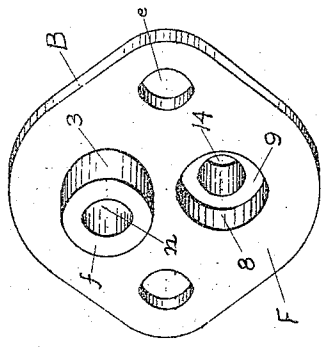

FIG. 4.

WITNESSES

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LOW-TENSION SPARKING MECHANISM FOR GAS-ENGINES.

1,022,642. Specification of Letters Patent. Patented Apr. 9, 1912.

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To all whom it may concern:

Be it known that I, HENRY J. PODLEŠÁK, a citizen of the United States, residing in Chicago, county of Cook, and State of Illinois, have invented new and useful Improvements in Low-Tension Sparking Mechanism for Gas-Engines, of which the following is a clear, full, and exact description.

The object of the present invention, broadly speaking, is to provide an improved construction of said sparking mechanism, possessing maximum mechanical efficiency, requiring small space and a small port through which the electrodes are introduced into the combustion chamber, and so designed as to reduce the cost of manufacture to a minimum.

Other objects and advantages of this invention will appear in the following specification and the accompanying drawings, in which:

Figure 1 is an elevation, partly sectional; Fig. 2 is a side elevation, showing the electrode actuating mechanism; Fig. 3 is another side elevation, showing the sparking or contact members and the port through which the electrodes are introduced into the combustion chamber; Fig. 4 is a perspective, showing the packing face of the body or frame.

B is a body or frame, carrying the various parts; F is a machined face between which and a similar face on the combustion chamber packing is placed to secure an air tight joint; 3 is a round lug secured to B, preferably made integral with it, and extending laterally from the face F, forms an extension of the bearing *n*, for the movable electrode M, which is shouldered at *f*, a seat face on extremity of lug 3; *m* is an arm integral with the electrode M, disposed at right angles thereto and carrying a contact member, or point, 2, which is arranged suitably to make contact with a similar contact member on the head 1 of the stationary, insulated electrode, or bolt, S.

8 is a round counterbore, extending from face F into the body B and terminates in a seat face 9; 14 is a round perforation through the body B, coaxial with the counterbore 8; 7 is a sleeve inserted into the counterbore 8, seating on seat 9 thereof, and extending laterally from the face F. The perforation in this sleeve 7 is coaxial with the perforation 14 and preferably of same size, so as to readily receive a bushing 6, which should be made of some non-combustible insulating material.

Insulating washers 5, are placed at each end of the insulating tube 6, thus affording complete insulation of the bolt S from the body B.

u is a nut by means of which the bolt S, the sleeve 7, tube 6, and washers 5, are all secured together and to the frame B; 10 is a metal washer protecting the washer 5, beneath it, from the nut *u;* the nut *l* is for securing the circuit wire to S.

The sleeve 7 may be secured into frame by threading it into the counterbore 8. However, the construction shown is obviously the least expensive, in manufacture. By using some non-combustible packing, such as asbestos, between the seat 9 and the sleeve 7, the seat faces on these need not be ground in to secure an air tight joint thereat.

The sleeve *b* is loosely mounted on M and is provided with a striker arm H, which normally engages a projection *h* of a sleeve *c*, this latter being pinned fast to electrode M by pin *d;* the torsion spring 11, coiled around sleeve *b*, has one of its ends engaged on pin *p* and the other on the striker arm H, the spring acting to normally hold said striker arm H bearing on the pin *p*, which pin serves as a stop for the striker arm H; the torsion spring 12, coiled around sleeve *c*, has one of its ends engaged on the striker arm H and the other end on a pin *d*, the spring acting to normally hold the projection *h*, of sleeve *c*, in contact with the striker arm H. The movable electrode M is pinned to the sleeve *c* in such relation that the contact points 2 are separated about one-sixteenth of an inch when the striker arm H and the sleeve *c* are in normal position, that is, arm H bearing against pin *p* and the projection *h* in contact with arm H.

The trip rod, or bar, T is so connected to some moving part of the engine that a reciprocating movement is imparted to it, in operation, at such period that the lip *t*, of this trip rod T, will actuate the striker arm H so that the contact points are brought together and then separated at the proper period for ignition. It will be apparent that as the trip rod T is moved to the right, Fig. 2, the lip *t* will engage the striker arm H, moving it to the right, turning the sleeve *b* clockwise; the movable electrode M, re-

siliently connected to the arm H, will be rotated clockwise until the two contact points 2 come together, then, as the arm H is moved farther, this arm H will be disengaged from the projection *h* of the sleeve *c* which is pinned fast to the electrode M. When the arm H has been moved to some such position as shown by the dotted lines, the lip *t* will trip off, or disengage the arm H, when this will be impelled back by the two springs 11 and 12, and strike a hammer-like blow to the projection *h*, thus making a practically instantaneous break in the current that may be flowing through the contact points 2, the spark resulting from this quick break being a most efficient one for igniting the combustible charges compressed in the combustion chamber of a gas engine.

It is well known that in the manufacture of igniter mechanism, of the class herein described, much difficulty is experienced in machining the frame or body so as to secure efficient packing surfaces, seat surfaces for the movable electrode, etc., it being necessary, in the constructions now in use, to resort to numerous and expensive machining operations to obtain good results. This is especially true in such cases where the port through which these parts of the body, or frame, carrying the electrodes, and the electrodes themselves are introduced into the combustion chamber, must be made small, because of the small combustion chamber necessary to obtain the proper compression in small engines and further the high compression necessary in all sizes of engines when alcohol is to be employed as the fuel. The igniter mechanism can, in such cases, be made smaller in size, but then its component parts become too small to be durable, are easily broken, hence expensive in maintenance, and expensive to make. By employing my construction, it is possible to utilize electrodes, and hence other parts as well, of a substantial size, and yet have the port through which the electrodes are inserted into the combustion chamber of relatively small size.

As will be apparent, the body B can be properly machined at very low cost by employing a chucking turret lathe, provided with a suitable chuck which will grasp the body, in the rough, so that the center line for bearing *n* coincides with center line of the lathe spindle; suitable tools are carried in the turret and in the cross slides to face the packing face F; the seat face *f*, to turn the lug 3, to bore and ream the bearing *n*, and to slightly groove or serrate the face F, all these operations in one setting. The remaining operations are simple and cheap.

I prefer not to thread the sleeve 7 into the body B, but to hold it in by the electrode, or bolt, S, as shown in Fig. 1, and using asbestos packing between the sleeve 7 and the seat 9; this not only makes an air tight joint, at low cost, but also affords a flexible or resilient joint upon which the expansion and contraction of the electrode S, due to heating and cooling, is taken up, instead of being taken up upon the washers 5, which are preferably of mica; the life of these washers is much prolonged and their efficiency is much increased by this, as they are kept tight at all times, whether the igniter is hot or cold. It is not necessary to insulate the sleeve 7, though this can be done.

I have described and shown the preferred form of the construction in my invention.

I claim:

1. In sparking mechanism for gas engines, the combination of a frame having a packing face and a lug extending laterally from said face and terminating in a seat face, a cylindrical perforation through the lug and the frame and substantially at right angles to the packing face, a shouldered rock shaft in said perforation, a counterbore in the frame at a distance from the lug and extending inwardly from the packing face, a second perforation through the frame co-axial with and of smaller diameter than the counterbore, a cylindrical sleeve inserted into the counterbore and extending beyond the packing face and having its perforation of substantially same size as and co-axial with the said second perforation, an insulating sleeve extending through the perforation of said sleeve and through said second perforation, insulating washers at either end of the insulating sleeve, a bolt passing through said washers and the insulating sleeve and rigidly clamping said washers and said sleeves to the frame, a contact member on the end of the bolt extending from the cylindrical sleeve, an arm secured to the end of the rock shaft extending from the seat face, and a second contact member secured to said arm and adapted to make contact with the first said contact member.

2. In sparking mechanism for gas engines, the combination of a frame having a packing face and a lug extending laterally from the packing face and terminating in a seat face, a cylindrical perforation through the lug and the frame, a counterbore at a distance from the lug and extending from the packing face into the frame, a second perforation through the frame co-axial with and of smaller size than the counterbore, a sleeve extending into the counterbore and relatively longer than the depth of the counterbore, a bolt passing through the sleeve and said co-axial perforation and insulatably secured to the body, a movable shouldered shaft in said cylindrical perforation, the shoulder of the shaft seating on the seat face on the lug, and an arm secured to the

shouldered end of the shaft extending laterally therefrom and adapted to make contact with the head of said bolt.

3. In sparking mechanism for gas engines, the combination of a frame having a packing face; a lug integral with said frame and extending laterally from and beyond the packing face and terminating in a seat face, a perforation through the lug and through the frame, a shouldered shaft passing through said perforation and extending beyond the frame, the shoulder seating on the seat face, a sleeve provided with an arm and loosely mounted on said shaft; a stop secured to the frame and adapted to engage the arm of said sleeve; a spring connected to said arm and the frame and adapted to normally hold said arm against said stop; a projection secured to said shaft and adapted to engage with said arm, a second spring adapted to normally hold the projection in engagement with said arm, means for actuating said arm, a second perforation through the frame at a distance from first said perforation, a counterbore extending from said packing face into the frame and co-axial with and of larger diameter than said second perforation, a cylindrical sleeve within and longer than the depth of the counterbore, a bolt passing through said sleeve and said second perforation and insulatably secured to the frame, and an arm rigidly secured to the shouldered end of said shaft and adapted to make contact with that end of the bolt projecting beyond said sleeve.

4. In sparking mechanism for gas engines, the combination of a frame having a packing face, a lug integral with the frame and extending laterally from said face and terminating in a seat face, a cylindrical perforation through the lug and the frame and at right angles to the seat face, a counterbore at a distance from the lug and extending from the packing face into the frame, a second perforation through the frame coaxial with and of relatively smaller size than the counterbore, and a perforated bushing extending and fitting into the counterbore and projecting beyond the packing face.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HENRY J. PODLEŠÁK.

Witnesses:

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