July 29, 1930. D. DAL LAGO 1,771,776

STARTING DEVICE FOR ENGINES OF THE DIESEL AND SEMI-DIESEL TYPE

Filed March 30, 1929

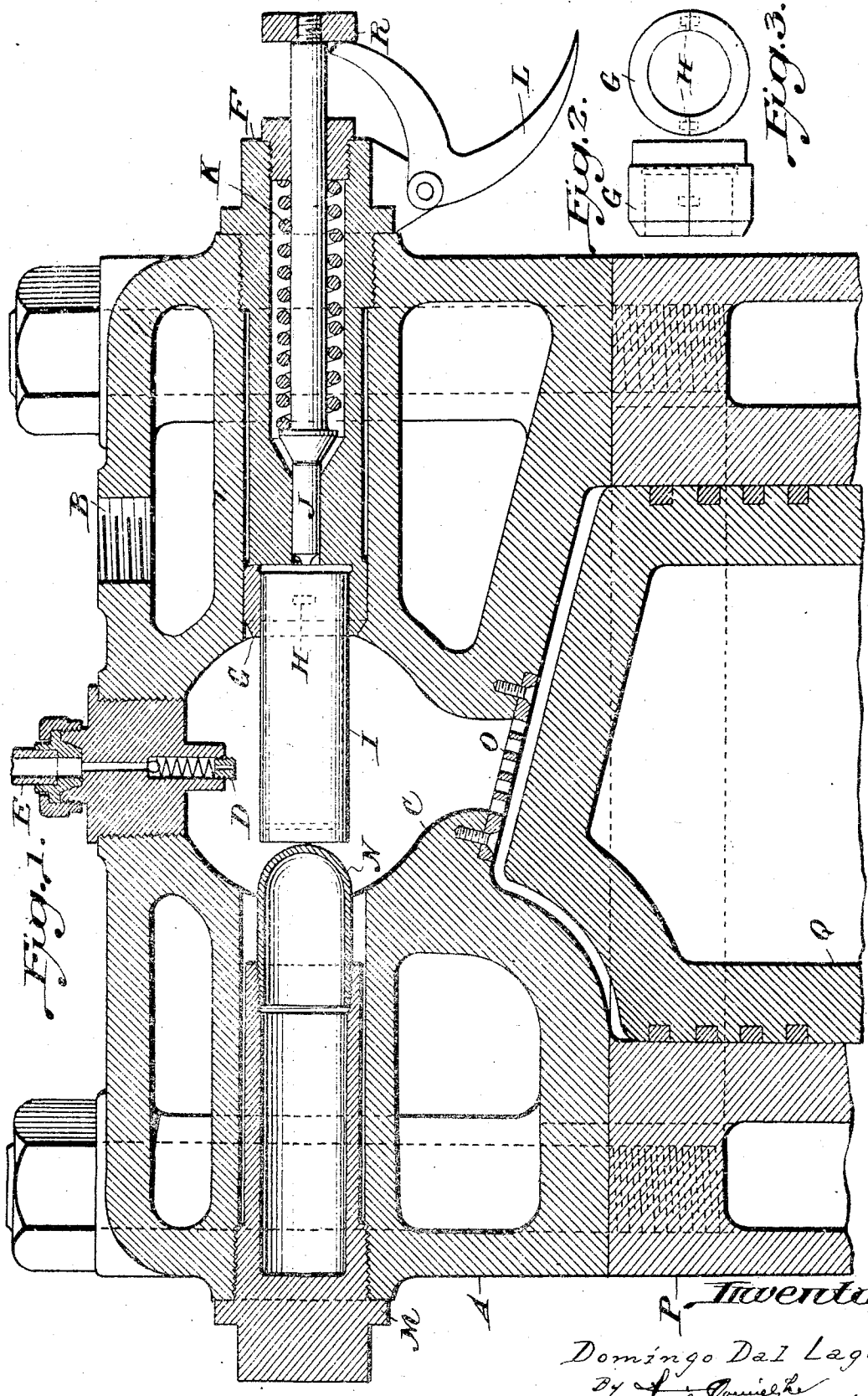


Fig. 1.

Fig. 2.

Fig. 3.

Inventor;
Domingo Dal Lago
By Luis Danieli
Atty.

By

Patented July 29, 1930 1,771,776

UNITED STATES PATENT OFFICE

DOMINGO DAL LAGO, OF ROSARIO DE SANTE FE, ARGENTINA

STARTING DEVICE FOR ENGINES OF THE DIESEL AND SEMI-DIESEL TYPE

Application filed March 30, 1929, Serial No. 351,226, and in Argentina November 21, 1928.

The present invention relates to a system for starting the operation, by means of an explosive, of engines which heretofore needed auxiliary means to that end, such as is the case with the "Diesel" and "Semi-Diesel" engines, for the starting of which there must be employed compressed air, or the fly-wheel must be turned by hand and the combustion chamber must be previously heated, all such operations being troublesome and same constituting up to the present the weak point of engines of this nature.

The device according to the invention may be easily applied to engines already in use regardless of size, with an absolutely favourable result, so that its use will assure the positive starting of the engine and with the same force as produced by the fuel when operating or running under normal load.

With these and other objects in view, the invention consists of certain novel features of constructon and arrangement of parts, as hereinafter described and as specified in the appended claims.

For the better understanding of the nature of my invention, same has been illustrated in the accompanying drawing on which corresponding or similar parts are designated by like characters of reference.

Fig. 1 is a sectional view showing the head of the cylinder of a two stroke engine provided with the device according to the invention which is secured to the upper part of the cylinder "P".

Fig. 2 is a side view of the guide-plug F which supports the explosive load I, showing the separable cap G serving for placing the cartridge within the groove.

Fig. 3 is an end view of the guide plug.

The present starting device comprises a head A provided with the usual refrigerating jacket, the outlet B for the refrigeration water, the combustion chamber C, the atomizer D and the fuel inlet E, as usual in these engines. Besides, the head is moulded so as to receive the guide-plug F with the upper cap G secured by means of two small pins H (see Fig. 2) this arrangement permitting of the cap being raised for insertion of the cartridge I which is fired by means of the striker J under the action of spring K and lever L.

At the opposite end of the head there is screwed the retainer-plug M provided with a tubular priming element formed with a semi-spherical end N and, finally, the grid O. The lower part P of Fig. 1 represents the engine cylinder with its piston Q which remains unaltered.

The engine is started in the following manner:—

The fly-wheel is turned to a position approximately 10° ahead of the dead point in the direction of run, same as is the case where compressed air is employed. After unscrewing the guide-plug F the cap G is raised, the cartridge I is placed inside the plug F, separating slightly the striker J, until it rests within the groove. Then, the cap G is placed again in position and the guide plug F is again brought to its original position, when the engine is ready for starting with its maximum power (as adjusted according to the quantity and quality of the explosive contained within the cartridge).

In order to start the engine downward pressure is applied to the lever L which presses on the head R of the striker J outwardly until the upper portion of the striker escapes the head R when, through the action of the spring K, the striker strikes the detonator of cartridge I thus producing the explosion and, therewith, the power necessary for starting the engine.

In the case of multi-cylinder engines each cylinder is provided with a device according to the invention, the cartridges of the various devices being fired by means of a mechanically controlled device.

The residue of the explosive cartridge is maintained burning owing to its being impregnated with an inflammable matter, which provides for the ignition of the engine fuel during several strokes until the engine is running at normal speed.

In order to provide for a concentration of heat at one point of the combustion chamber C, in the case of engines of the "semi-Diesel" type, the retainer-plug M is provided with a blind tube N having thin walls which per-

mits of its temperature being rapidly increased and maintained so as to produce constant ignition after the explosive has worked, or when the compression has not been sufficient to provoke the combustion.

The function of the grid O is to maintain the heat focus within the combustion chamber C and to provoke ignition until the residue of the cartridge becomes completely burned out.

Having thus fully described my said invention, what I claim is:—

1. In a starting device for combustion engines, the combination with a cylinder having a communicating combustion chamber and a piston reciprocally mounted in the the cylinder; of an explosive cartridge extending into the combustion chamber, and means for exploding the cartridge; a priming element adapted to be heated in the explosive charge of the cartridge and means communicating with the combustion chamber to hold said element in operative relation to said cartridge.

2. In a starting device for combustion engines, the combination with a cylinder having a communicating combustion chamber and piston reciprocally mounted in the cylinder, of an explosive cartridge extending into the combustion chamber, and means for exploding the cartridge; a tubular priming element; a retainer-plug communicating with the combustion chamber and adapted to hold said element in operative relation to said cartridge, said priming element being adapted to receive and retain heat from the explosive charge of the cartridge to maintain constant ignition after the initial explosion.

3. In a starting device for combustion engines, the combination with a cylinder having a communicating combustion chamber and a piston reciprocally mounted in the cylinder; of an explosive cartridge extending into the combustion chamber, and actuating mechanism for exploding the cartridge; a retainer-plug communicating with the combustion chamber and a tubular priming cap held in said plug in operative relation to the cartridge; said cap being responsive to the explosive charge of the cartridge and adapted to maintain the ignition temperature after the initial explosion of the cartridge.

4. In a starting device for combustion engines, the combination with a cylinder, having a communicating combustion chamber, a piston reciprocally mounted in the cylinder; of a grid plate interposed between the cylinder and chamber; an explosive cartridge extending into the combustion chamber, and means for exploding the cartridge; a priming element adapted to be heated by the explosive charge of the cartridge and means communicating with the combustion chamber to hold said element in operative relation to said cartridge.

5. In a starting device for combustion engines, the combination with a cylinder, having a communicating combustion chamber, and a piston reciprocally mounted in the cylinder; of a slow-burning explosive cartridge extending into the combustion chamber, including means for exploding the cartridge; and a grid plate interposed between the cylinder and chamber to maintain and confine the heat focus within said chamber.

In testimony whereof I affix my signature.

DOMINGO DAL LAGO.