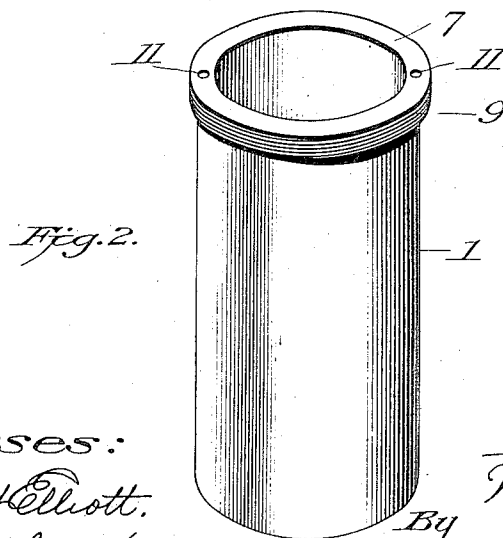
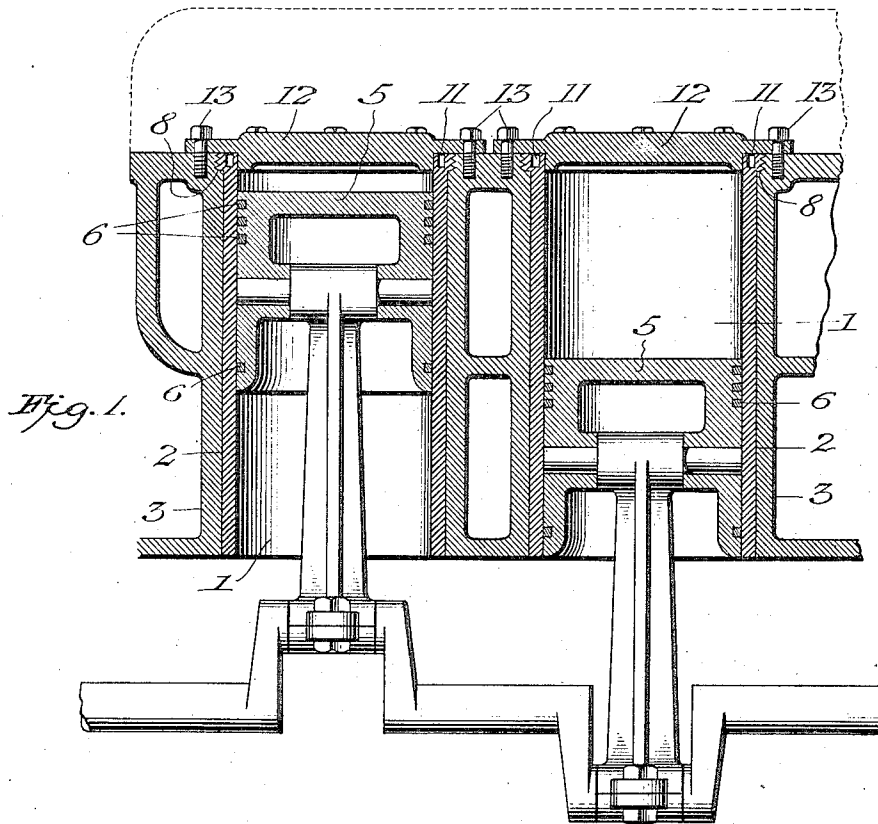


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 REMOVABLE CYLINDER LINING FOR EXPLOSIVE AND OTHER ENGINES.
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1,127,783.

Patented Feb. 9, 1915.



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UNITED STATES PATENT OFFICE.

WALTER A. LEIMER, OF DENVER, COLORADO.

REMOVABLE CYLINDER-LINING FOR EXPLOSIVE AND OTHER ENGINES.

1,127,783.

Specification of Letters Patent.

Patented Feb. 9, 1915.

Application filed June 27, 1914. Serial No. 847,783.

To all whom it may concern:

Be it known that I, WALTER A. LEIMER, a citizen of the United States of America, residing at the city and county of Denver and State of Colorado, have invented a new and useful Removable Cylinder-Lining for Explosive and other Engines, of which the following is a specification.

My invention relates to a removable and renewable cylinder lining for the cylinders of explosive mixture and expansive fluid automobiles and marine and other engines; and the objects of my invention are: First, to provide a cylindrical lining member that is adapted to be placed in the casings of engines by the manufacturers thereof at the time of their manufacture, and that can be quickly removed from a cylinder and a new one inserted in its place by the driver of an automobile when a cylinder or cylinders of the engine become roughened and cut up from running dry. And second, to provide an easy and quickly removable and replaceable cylinder lining for the explosive engines of automobiles, that can be removed and new ones replaced by the owners and drivers of automobiles at any time and place when such a change is required. I attain these objects by the mechanism illustrated in the accompanying drawings, in which:

Figure 1, is a sectional view of a portion of an automobile engine, showing the application of the improved cylinder lining. And Fig. 2, is a perspective view of one of the improved linings.

Similar letters of reference refer to similar parts throughout the several views.

Referring to the drawings, the numeral 1 designates a substantially instantaneously applied removable and renewable cylinder lining for automobiles and other engines. In the present state of the art, the cylinders of automobile, marine, and other engines are made of solid castings that are bored out to receive directly in running contact with their inner peripheral walls the piston heads and piston rings of the reciprocating pistons of the cylinders of the engines. This construction is eminently satisfactory in stationary engines that are constantly under the watchful care of professional licensed engineers. But the control, care, manipulation, and the driving of automobiles and other engines by a great many thousand of automobile owners or members of their families, and even by chauffeurs that have not been properly and thoroughly

instructed in the care, operation, and running of explosive mixtures and expansive fluid operated automobiles and other engines, makes this construction extremely unsatisfactory, inasmuch as through forgetfulness, neglect, carelessness, or ignorance, these drivers of cars fail to properly lubricate the cylinders and pistons of their engines, and suddenly when running their cars the engine stops and investigation shows that the cylinder and piston head and rings have run dry and have roughed up and cut the inner peripheral walls of the cylinder. To remove the piston head and rings and replace them by new similar parts is a matter of but a short period of time, but the roughed and cut cylinder or cylinders must be rebored out larger and a new piston head and rings fitting the new bore will have to be made. This work necessitates the removal of the engines from their frames, and their shipment to a shop properly equipped to rebore them, and as these stoppages of the engine are apt to occur when away from home, there is generally the discomfort and delay in returning, while the automobile is apt to be out of use for about two weeks to one or two months.

My present invention contemplates a cylindrical lining member comprising a cylindrical sleeve or shell of any predetermined thickness of metal, that can be fitted into the casings of the engines when and at the time they are made by the manufacturers, that will make it possible in stoppages and shut-downs of one or more cylinders of an engine, to quickly remove the roughened and cut up lining of the cylinder and replace it by a new one, as well as replace the roughened up piston head and rings by a new one, it being understood that the driver of a car will carry a set of cylinder linings and pistons in his car, if on long trips.

With these objects in view, my invention consists of a cylinder 1, of any suitable metal, but preferably of cast iron machine finished on its outside peripheral surface, and fitted closely but removably within the cylindrical bore 2, formed in the engine casting 3, to receive it. The bore in the engine casting is made especially to receive my cylinder lining, which is made with an axial bore of a size to receive reciprocally and operatively the piston head 5, with its rings 6, to allow the piston head to travel throughout the full length of its reciprocal

stroke in an operative manner and as illustrated. The cylindrical casing of the engine's casting and my cylinder lining are made of the same length. As the lining in a cylinder would be subject to severe strains from the constant explosions and the jarring and vibratory movement of the automobile while running, it is necessary that some means be employed to firmly secure the lining to the casing against accidental displacement, and yet enable it to be easily and quickly removed therefrom and a new one as easily and quickly inserted in its place.

My invention contemplates in this respect any and all means for securing the lining to the cylinder. I preferably, however, carry out this feature of my invention in the following manner: At the top of the cylinder lining, I form a circular flange portion 7, which is of enough larger diameter than the outside diameter of the cylinder lining to project over into a counter-bored recess 8, that is formed in the top edge of the engine's cylinder casing. The peripheral edge of this flange 7 is provided with a screw thread 9, and the counter-bored recess is also provided with an internal thread. This threaded counterbored recess is formed by the manufacturer of the engine at the time the engine is constructed, and my cylinder lining is inserted into the engine's casing and is threadedly secured to it.

In order to quickly screw the cylinder in place after it has been placed in the cylinder casing, I provide the top surface of the cylinder lining with two oppositely positioned apertures 11, in which the ends of a spanner wrench, which I do not illustrate, are adapted to fit, and by which it may be rotated to be screwed either into or out of the cylinder bore of the engine's casing that is formed to receive the piston head's engaging lining.

As illustrated, my cylinder lining is fitted to a water jacketed explosive engine, and is shown as being inserted into the upper end of the cylinder, and after it has been inserted and screwed into place the cylinder head 12 is placed on the casing over it and is secured to the casing by cap screws 13. When my new cylinder lining is applied to single cylinder engines, it can be inserted into the opposite end of the casing if desired. It should, however, be placed in the end that is most accessible to its removal and replacement by another one.

While I have stated that my improved lining is especially adapted to be made and inserted in engines while in course of construction, yet it is possible on cars that have cylinders that need reboring, and such cars if their engine casings are thick enough can

be rebored large enough to receive one of my cylinder linings, which in turn would be axially bored to receive the regular standard size piston head of that particular car, and the car would then be in shape to receive a new cylinder at any time the condition of the ones in the engine casing required it.

While I have not illustrated any ports through the lining, nevertheless it is understood that where my linings are fitted to engines having ports leading into the piston head cylinder, such ports would extend through the shell of the lining, it being understood that my cylinder linings are to be made an operative part of the engine to which they are applied.

My invention provides a cylinder lining for the cylinders of automobile, marine, and other explosive mixtures and for expansive fluid operated engines, that can be easily and quickly removed and a new one inserted in its place by owners and drivers of cars and motor boats who have not had much if any mechanical training in the care of and who are not expert in the constructive assembling and the disconnecting and connecting of the various intricate parts of such engines.

Having described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. A cylinder lining for the cylinders of explosive engines of automobiles, the combination with the casing of an engine provided with a cylindrical bore containing an enlarged threaded counter-bore, of a cylindrical sleeve or lining provided with a projecting flange at its upper end, the peripheral surface of which is provided with a screw thread.

2. A lining for engine cylinders as specified, consisting of a cylindrical sleeve having a threaded flange at one end.

3. A lining for engine cylinders as specified, comprising a cylindrical sleeve having an externally threaded flange at one end, and vertical wrench-receiving apertures in said flange.

4. The combination with a cylinder casing having a cylinder bore provided with a threaded counter-bore at its upper end, of a sleeve which fits tightly in said cylinder bore, the upper end of which has a threaded flange which enters said threaded counter-bore, said flange being provided with wrench-receiving apertures.

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

WALTER A. LEIMER.

Witnesses:

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ELIZABETH SMITH.