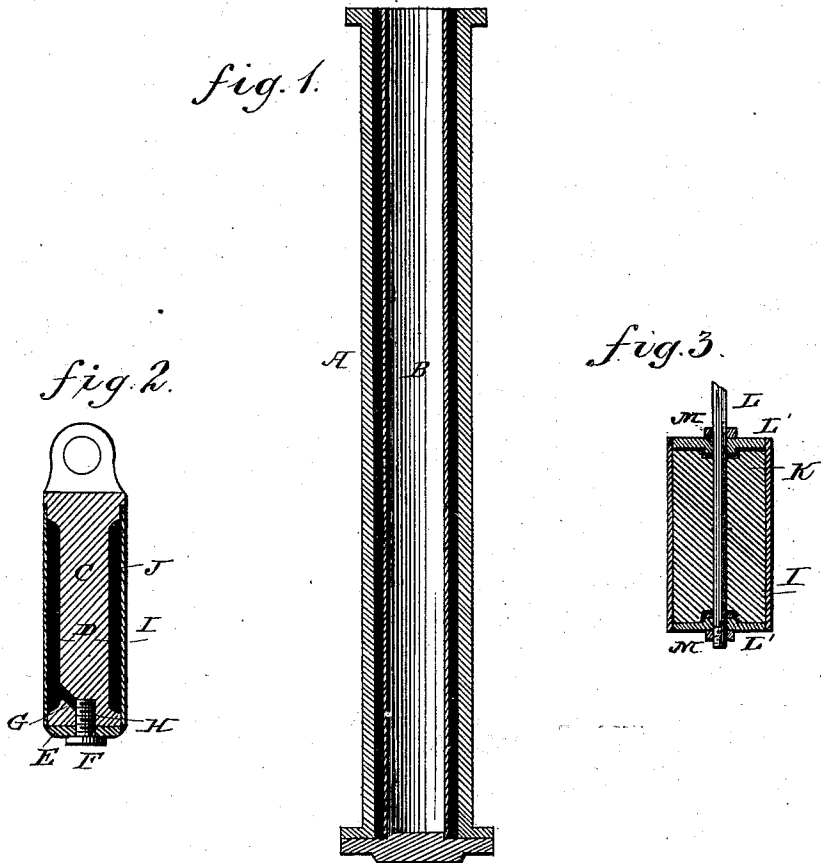


(No Model.)

H. M. L. CROUAN.
CYLINDER.

No. 316,749.

Patented Apr. 28, 1885.



WITNESSES:

Med. & Dutertch,
Wm. Bagger

Henri Marie Léon Crouan,

INVENTOR.

by *Louis Bagger & Co.*

ATTORNEYS.

UNITED STATES PATENT OFFICE.

HENRI MARIE LÉON CROUAN, OF PARIS, FRANCE.

CYLINDER.

SPECIFICATION forming part of Letters Patent No. 316,749, dated April 28, 1885.

Application filed August 29, 1884. (No model.) Patented in France October 11, 1883, No. 157,969.

To all whom it may concern:

Be it known that I, HENRI MARIE LÉON CROUAN, of the city of Paris, in the Republic of France, have invented certain new and useful Improvements in Cylinders; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification, and in which—

Figure 1 is a vertical sectional view of one of my improved interiorly-lined cylinders. Fig. 2 is a vertical sectional view of one of my improved cylinders having an exterior shell, and Fig. 3 is a vertical sectional view illustrating a modification of the latter.

The same letters refer to the same parts in all the figures.

This invention has relation to cylinders, either tubular or solid, adapted to be used as pump-cylinders, pistons, and for analogous purposes; and it has for its object to produce a cylinder which shall be inexpensive, durable, and efficient, and the surface of which, interior or exterior, as the case may be, shall be susceptible of receiving a great degree of smoothness and polish, which may be imparted thereto easily and at small expense. In other words, I propose by my invention to furnish a simple and efficient substitute for the drilled and polished iron cylinders usually employed for the purposes enumerated.

With these ends in view the invention consists in the improved construction and arrangement of parts, which will be hereinafter fully described, and particularly pointed out in the claim.

In the drawings hereto annexed, A designates an ordinary tubular iron cylinder, which may be cast or otherwise constructed in any suitable manner, and the inner surface of which is left rough or undrilled or polished.

B is a cylindrical tube of brass, copper, or other comparatively soft metal, the inner surface of which is smoothly polished in any suitable manner. The exterior diameter of the tube B is to be somewhat less than the interior diameter of the tube A, into which it is inserted, the intervening space being filled with rosin or with cement of any suitable

kind, by means of which the inner tube is retained securely in position. The nature of the filling used will be determined to a considerable extent by the use to which the cylinder is to be put. Thus, for a cold-water pump, a filling of rosin would usually answer, while for a hot-water pump or for a steam-cylinder, the filling would have to be of such a nature as not to be influenced by the higher temperature to which it would be subjected—as, for instance, cement.

It is obvious that a high degree of smoothness and polish may be imparted to the inner or lining cylinder more easily and at less expense than to an ordinary iron cylinder, owing to the softer material of which it is made; hence I am enabled to produce a cylinder of a given size at a less expense, while it is in every respect equally as efficient as the cylinders ordinarily made.

In Fig. 2 of the drawings I have shown the application of my invention to a solid cylinder or piston. In this case C designates the core of the cylinder, which is of iron, and provided with an annular groove, D, extending nearly from end to end of the same.

E is a disk or washer, secured at the lower end of the same by a screw, F, and a channel, G, extends from the screw-hole H to the annular groove or space D.

I is the outer shell, which is made, as in the former case, of brass or other comparatively soft metal, and J is the filling, which may, as before, be of rosin, cement, molten lead, or any other suitable material. I prefer to insert the filling in a molten state through the screw-hole H and channel G, after which the plate or washer is placed in position, serving to bind the parts firmly together.

In Fig. 3 I have shown a modification which consists of disposing the outer polished shell directly against a core, K, of wood or analogous material. Upon the piston-rod L, which extends longitudinally through the core, I place a pair of followers, L L, bearing against the ends of the core, and secured by means of jam-nuts M M. By this construction, the expense of production is greatly diminished, and a device is produced which for many purposes will be found equally as efficient as the more expensive forms.

I am aware that it is not broadly new to

place a lining of either harder or softer metal than the metal of a cylinder within the same, and to recess the inner sides of the said cylinder to enable it to receive a packing; and I
5 am likewise aware that split packing-rings of metal have been placed around pistons having means for expanding them from the inside, and I do not claim such constructions; but

I claim—

10 A piston consisting of an annularly-recessed core having a screw-hole in its end and a channel extending from said screw-hole to the annular recess, an exterior shell fitting over the

recess around the core, a plastic filling in the annular recess, and a screw-plug fitting in the screw-hole in the end of the core, as and for
15 the purpose shown and set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 15th day of February, 1884.

HENRI MARIE LÉON CROUAN.

Witnesses:

FREDERIC MATRAY,
ROBT. M. HOOPER.