

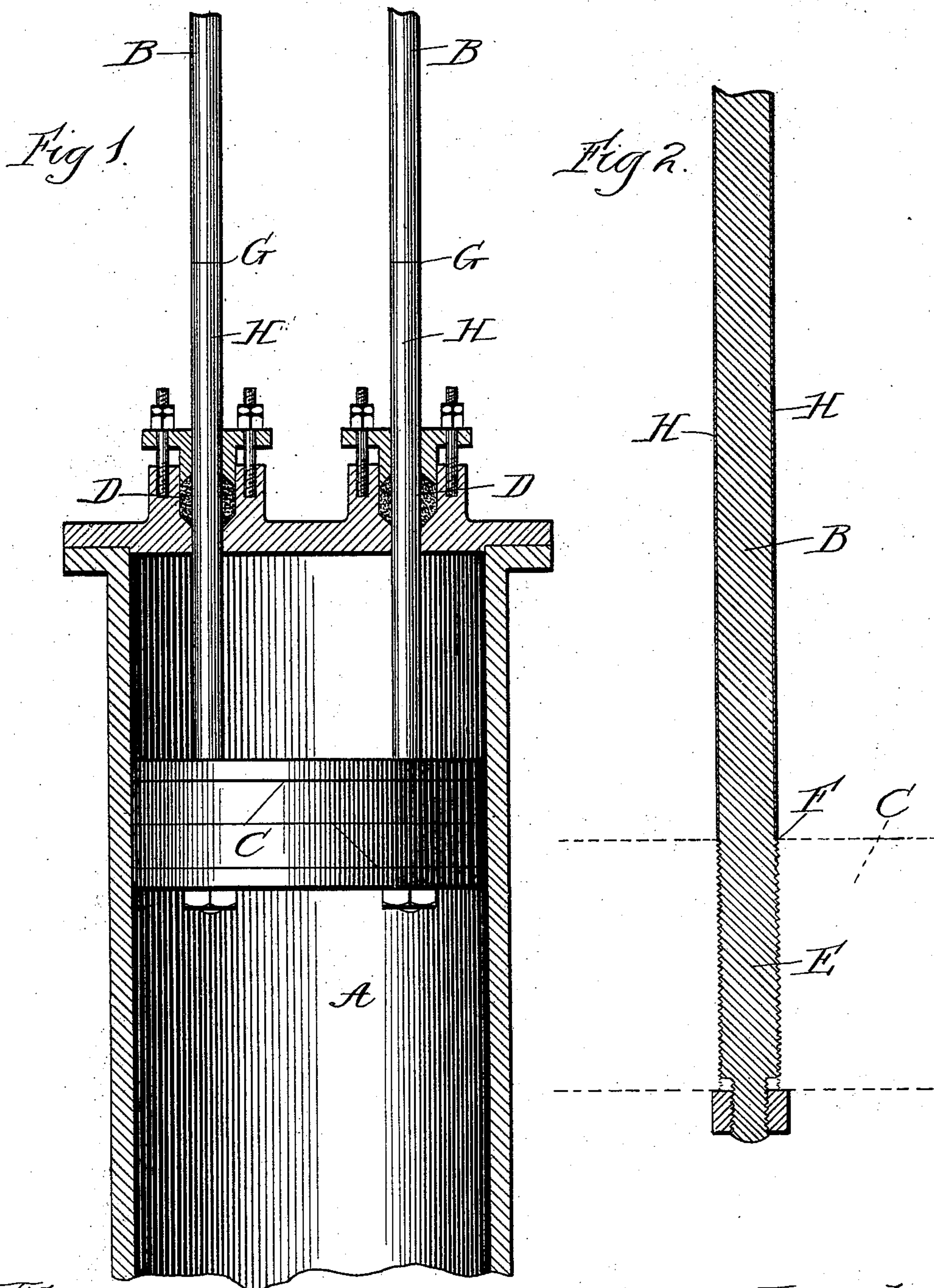
(No Model.)

W. E. CARR.

PISTON ROD AND METHOD OF PROTECTING SAME.

No. 532,529.

Patented Jan. 15, 1895.



Witnesses
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UNITED STATES PATENT OFFICE.

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PISTON-ROD AND METHOD OF PROTECTING SAME.

SPECIFICATION forming part of Letters Patent No. 532,529, dated January 15, 1895.

Application filed September 1, 1894. Serial No. 521,906. (No model.)

To all whom it may concern:

Be it known that I, WALTER E. CARR, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Piston-Rod and Method of Protecting the Same, of which the following is a specification.

This invention relates to piston rods for steam, hydraulic or other fluid cylinders, and the method of making the same.

The object of the invention is to protect the piston rod from the injurious action of the steam or fluid with which it comes in contact.

The invention consists substantially in the method and construction hereinafter more fully set forth, as indicated in the accompanying drawings and finally pointed out in the appended claims.

Referring to the accompanying drawings, Figure 1 is a view in central longitudinal section of a cylinder with a piston and a pair of piston rods embodying my invention shown in elevation. Fig. 2 is an enlarged detail view illustrating in central longitudinal section a piston rod constructed in accordance with my invention.

In the drawings reference sign A designates a steam, hydraulic or other fluid motor cylinder.

C designates a piston of usual construction; B, piston rods, and D the stuffing boxes therefor. The end of the piston rod is screw threaded in the usual manner as at E to secure the same to the piston C, as indicated in Fig. 2.

It has been found in practice that piston rods are injuriously affected by coming into contact with the steam, water or other fluid employed in the operation of the piston, on account of corrosion, eating away or pitting of the rod by the chemical or acid constituents thereof. This pitting or eating away of the piston rod has frequently progressed from prolonged use to the point of liability to breakage before the defect is discovered. Moreover, any loss of strength or rigidity in the rod is to be guarded against in order to avoid serious accidents in the many relations in which cylinders and pistons having piston rods are used.

It has been essayed to correct the evil

mentioned by inclosing the piston rod, a portion of its length, in a hollow sleeve or tube of copper or other suitable material not subject to the injurious action of the steam, water or other fluid. To this end it has been the practice to reduce the size of the piston rod a portion of the length thereof by turning the same down in a lathe and then slipping the sleeve or tube into place thereon, the amount of material removed from the piston rod corresponding to the thickness of the metal tube or sleeve in order to present a continuously smooth exterior. This method has proven objectionable for several reasons. In the first place, it has been necessary to reduce the size of the piston rod to its end in order to slip the tube or sleeve onto the rod, and hence the rod has been thereby weakened at the end where it is secured to the piston, and hence at the point where it is desirable that it be strongest. Again, the incasing of the piston rod in a sleeve or tube does not operate to supply strength and rigidity to the rod in place of the material removed therefrom to accommodate the sleeve or tube, and hence the rod is materially and undesirably weakened throughout the entire portion thereof which has been reduced in size. Again, the accurate turning of the rod in order to reduce the same to the necessary size to receive the tube or sleeve has necessitated the most skillful handling and adjustments in order to secure absolute accuracy. Moreover, the use of a tube or shell resulted in forming a seam or joint at the extremity thereof, which permitted the injurious action of the steam, water or other fluid to take place at that point. In carrying out my invention I avoid all these objections in the following manner:

Instead of reducing the rod to the extremity thereof, I reduce it only a portion of its length and end the reduced part at the point where the screw threads begin for securing the rod to the piston as indicated at F, Fig. 2, and hence retain the screw-threaded portion E of full size. By any suitable or convenient arrangement of apparatus I electrodeposit copper, brass, or any suitable metal not subject to the injurious action of the steam, water or other fluid upon that portion of the rod which has been reduced. During the process of the deposition the particles or

molecules of the metal are supplied to the rod in a condition to supply the loss of the material removed during the turning of the rod. Objectionable seams are avoided and
5 only ordinary skill and handling is required in positioning the rod in the lathe to be turned down. I indicate in Fig. 1 the outer point of the rod to which the deposited sheathing is carried by reference sign G, and the sheath-
10 ing applied in accordance with my invention I designate by reference sign H.

While I have shown my invention as applied to a piston having two piston rods it is evident and will be readily understood that
15 it is broadly adapted for use in connection with one or several rods to the same piston. It will also be evident that my invention may be applied to any piston used for any purpose.

20 Having now fully ascertained the nature of my invention and the manner of its practical application, what I claim as new, and desire to secure by Letters Patent of the United States, is—

25 1. The method of protecting piston rods, which consists in removing a portion of the material out of which the rod is made, and then electro-depositing a suitable protecting material thereon to take the place of the re-
30 moved portion; as and for the purpose set forth.

2. The method of protecting piston rods

from the action of steam, water or other fluid, which consists in removing a portion of the body of the rod intermediate its ends, and
35 then supplying the place of the removed part by other material in a seamless condition by electro-depositing, whereby the rod is not reduced in strength by reason of such removal; as and for the purpose set forth. 40

3. As an article of manufacture a piston rod, having a portion of the body thereof removed and a sheathing of protective material applied thereto in place of the removed por-
45 tion by electro-depositing suitable material thereon, whereby the strength of the rod is not reduced by such removal; as and for the purpose set forth.

4. The combination with a piston rod, having a portion of its material removed to a
50 point adjacent to its point of attachment to the piston, and a coating of protective material electro-deposited on said rod in place of the removed portion, whereby said rod is protected from the action of the steam, water
55 or other fluid, and is not weakened by said removal; as and for the purpose set forth.

In witness whereof I have hereunto set my hand this 29th day of August, 1894, in the presence of the subscribing witnesses.

WALTER E. CARR.

Witnesses:

S. E. DARBY,

M. I. CAVANAGH.