

J. W. DOUGLAS.  
Lining Pump-Cylinders.

No. 158,786.

Patented Jan. 19, 1875.

Fig. 1

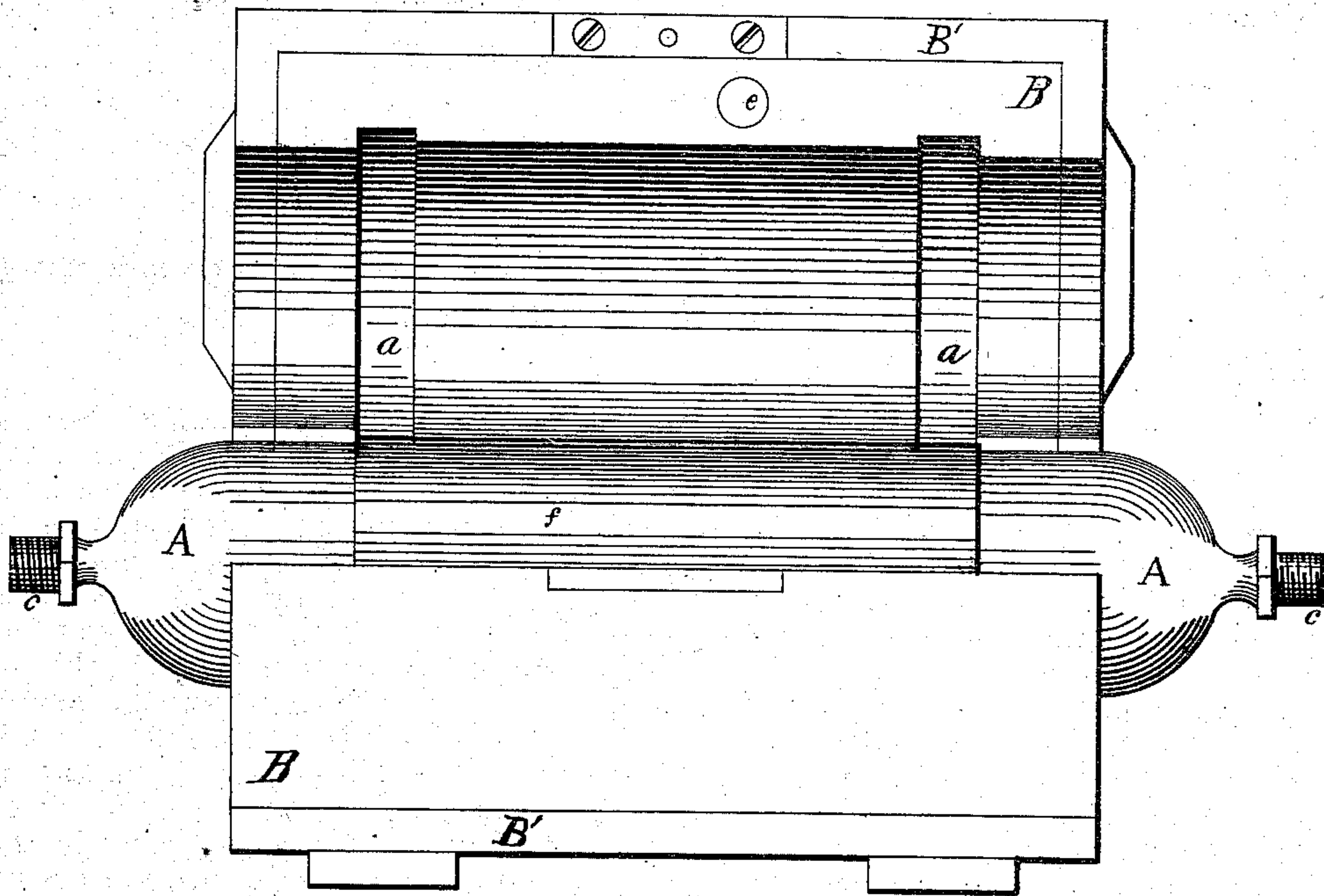
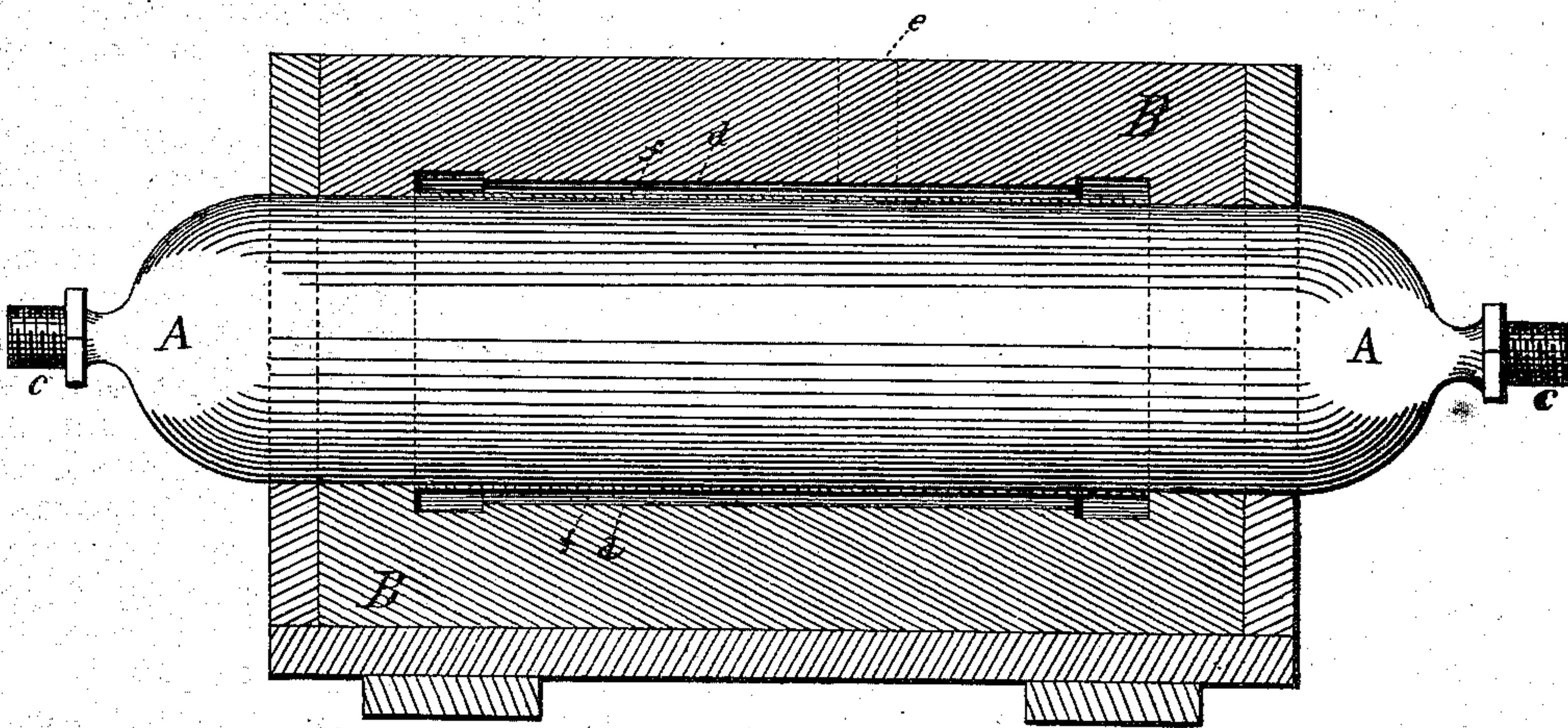


Fig. 2



WITNESSES

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# UNITED STATES PATENT OFFICE.

JOSEPH W. DOUGLAS, OF MIDDLETOWN, CONNECTICUT, ASSIGNOR TO W.  
AND B. DOUGLAS, OF SAME PLACE.

## IMPROVEMENT IN LINING PUMP-CYLINDERS.

Specification forming part of Letters Patent No. 158,786, dated January 19, 1875; application filed July 13, 1874.

*To all whom it may concern:*

Be it known that I, JOSEPH W. DOUGLAS, of Middletown, Connecticut, have invented a new and Improved Lining of an Iron Pump-Cylinder, of which the following is a full and sufficient description, reference being had to the drawings and reference letters and figures, making part of the description.

The use of iron pump-cylinders without linings exposes the iron to the action of air and water, which deteriorates both the water and the inner surface of the iron cylinder by rust and roughness, wearing away the piston-packing and the cylinder at the same time.

Lining iron pump-cylinders is not new, but the mode of doing it may be new and patentable.

The old method of lining iron pumps with copper or brass was to cast the iron part first, bore out the same, and force the lining into its place, a process expensive and difficult. The remedy proposed by Claxton in England in February, 1864, was to make the brass lining to a cannon of iron by making the lining first, putting it in a mold, and casting the iron around it. In the same year Messrs. Sewell and Cameron, in the United States, filed an application for casting and lining iron pump-cylinders, but were rejected. They used the devices described by Claxton. In 1867 G. W. Dismar used the same device in the manufacture of the journal-boxes of carriage-wheels, which was patented. This applicant took up the subject without knowing what had been done, and soon found that copper-lined iron, or brass-lined, could not be so lined unless the lining be very thin, and the thinner the lining the greater the danger of melting the lining in the act of pouring the molten iron around the lining-cylinder as it lies in the mold. To obviate this evil the applicant devised a thin sheet of tinned iron, covering the entire lining-cylinder, which may be copper, brass, or thin glass, which tinned-iron sleeve protects the lining from fusion, and thus preserves a successful manufacture.

To prepare for the operation of making and lining an iron pump-cylinder, the mold is

placed horizontally in the usual flask to receive the lining-cylinder, which, at one end, is fitted to a coupling-piece for connecting with a water-receiving pipe, while the other end of the lining-cylinder is connected, by a coupling, to the discharge water-pipe, by which the cooling water is carried away from the lining-cylinder. The mold is made for the outside of the lining-cylinder in a common flask in the usual way of iron-mold casting of sand-core points. The mold is closed, leaving a pouring-hole for charging the metal during the operation of casting. To prevent melting the lining-cylinder I cover its entire surface with a sheet of tinned iron, a sleeve protecting it from undergoing fusion from the heat of the iron while being poured, the sleeve conducting away and spreading the heat to every part of the cylinder, so that no one part would be hot enough to fuse.

In the accompanying drawings, Figure 1 represents a longitudinal elevation of the mold; B, its cover; B', its cover part thrown back, revealing the pouring-hole *e*, seen on the under side; also, the lining-cylinder A and its screw-couplings *c c*, connecting it with the discharge-pipe. Fig. 2 represents a longitudinal section through the mold, cover, and lining-cylinder A, the edges of which sleeves F, flange-spaces *a a*, ready to be filled with the cast-iron around the cylinder A, covered by its protecting sleeve, indicating sufficient space in the sides and flange-spaces for giving strength to the outer part of the cylinder.

Having shown the nature of the process of lining iron pump-cylinders with copper, brass, or glass, by pouring the molten iron around the lining previously covered with a metal sleeve, what I claim as my invention, and desire to secure by Letters Patent, is—

The combination of the metal sleeve F, the lining-cylinder A, and the iron cylinder, as described.

JOS. W. DOUGLAS.

Witnesses:

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