

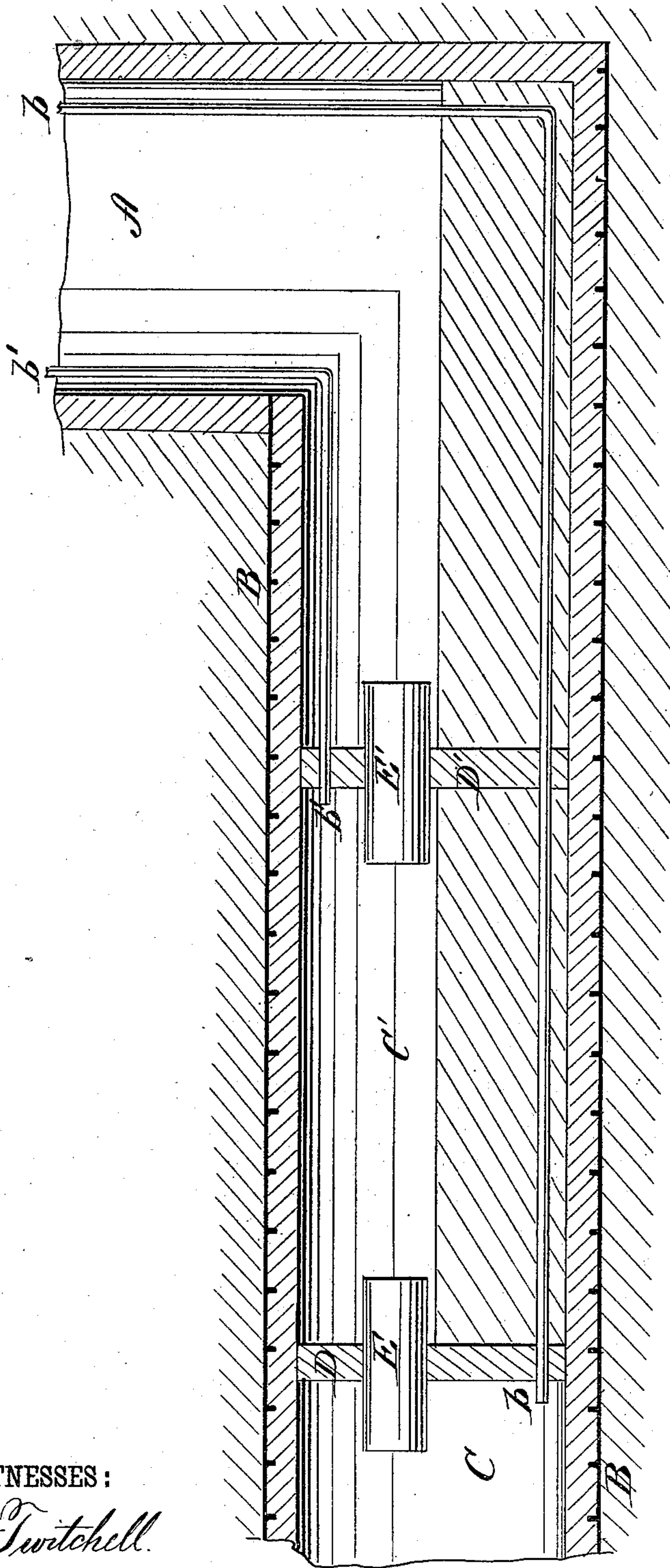
(No Model.)

DE WITT C. HASKIN.

CONSTRUCTION OF SUBMARINE TUNNELS.

No. 286,924.

Patented Oct. 16, 1883.



WITNESSES :

Donn Twitchell.

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DE WITT C. HASKIN, OF NEW YORK, N. Y.

CONSTRUCTION OF SUBMARINE TUNNELS.

SPECIFICATION forming part of Letters Patent No. 286,924, dated October 16, 1883.

Application filed January 31, 1883. (No model.)

To all whom it may concern:

Be it known that I, DE WITT C. HASKIN, of the city, county, and State of New York, have invented certain new and useful Improvements
5 in the Construction of Submarine Tunnels and other Works, of which the following is a full, clear, and exact description.

This invention relates to the construction of submarine tunnels and other works or
10 structures in which the work under-progress is carried on within an advance chamber or section charged with compressed air, and which is separated from the finished or partly-completed work in the rear by a bulk-head fitted
15 with an air-lock constructed with opposite end doors to admit of the passage of men and materials from the one section to the other without impairing or destroying the higher pressure in the advance section under progress. Thus
20 tunneling or excavating subject to compressed air in the portion or section of the work under operation has the advantage of more effectually keeping out water from entering said section or portion being excavated and of
25 partially supporting the earth therein, also of facilitating the removal of much of the excavated material. An inconvenience, however, is experienced in the effect upon the health and comfort of the workmen by the too abrupt
30 transition from the one section or chamber to the other of the tunnel or other structure being made by reason of the difference of atmospheric pressure in the chambers or sections separated by the bulk-head and single air-lock.
35 My invention obviates this difficulty by using two or more air-locks arranged one in advance of the other, and chambers or divided sections which they connect, to correspond, together with means for supplying said chambers or sections with compressed air at different
40 pressures—that is, in the one chamber as compared to the other—whereby the workmen may first pass through one of the locks into a compressed-air chamber of less pressure than
45 is required where the work or excavation is being carried on, and afterward through another air-lock into a second or advance chamber of higher pressure, and which may be the working-chamber, or, in case of the same system being further extended, may be a preparatory chamber to the working one. By

thus graduating the pressure in the chambers, I moderate the effect which the sudden changes from normal atmospheric pressure to a much higher pressure produce upon the workmen. 55

Reference is to be had to the accompanying drawing, forming part of this specification, which is a vertical longitudinal section of a submarine tunnel, in part, with my improvement applied. 60

A in the drawing indicates the perpendicular shaft down and up, through which ingress and egress is had to and from the tunnel B, in course of construction. C represents an advance chamber, in which the work is being
65 carried on, and D D' are bulk-heads separating it from and forming a second or rear chamber, C'. These chambers communicate with each other and with the portion of the tunnel immediately in connection with the shaft A by independent air-locks E E', which may be of the
70 same construction for the passage of men and materials through them as the single air-locks at present in use in the construction of submarine tunnels. Each of the chambers C C' is
75 supplied with compressed air, but of different pressures. Thus the chamber C' is supplied with air at a higher pressure than the normal one of the atmosphere, but of less pressure than that in the advance or working chamber
80 C, where the highest pressure is required, so that the workmen in passing from the portion of the tunnel immediately in connection with the shaft A into the chamber C' will experience
85 little or no inconvenience from the denser state of the air in said chamber, and will be prepared for the still higher pressure in the advance or working chamber C when passing into it. The chambers C C' may be thus supplied with
90 compressed air at the required difference of pressures by means of independent pipes b b', connecting said chambers, respectively, either by passing through the bulk-heads or through the air-locks, with suitable compressors or compressed-air reservoirs outside of or above
95 the shaft, or the rear chamber, C', may be kept at the requisite intermediate pressure by a supply of waste air from the front chamber.

Having thus fully described my invention, I claim as new and desire to secure by Letters
100 Patent—

1. The improvement in the art of construct-

ing submarine tunnels and other works, which consists, substantially, in dividing the tunnel or structure under progress into two or more chambers—one in advance of the other—by
5 partitions closing the same, charging the said chambers with compressed air at different pressures, respectively, and providing means of passage from one of said chambers into the other, essentially as and for the purpose here-
10 in set forth.

2. In the construction of submarine tunnels and other works in which compressed air is

used as the medium to operate in, the combination of two or more chambers or sections of the work separated by partitions closing the same, air-locks connecting the same, and
15 means for supplying said chambers with compressed air at different pressures, respectively, substantially as specified.

DE WITT C. HASKIN.

Witnesses:

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