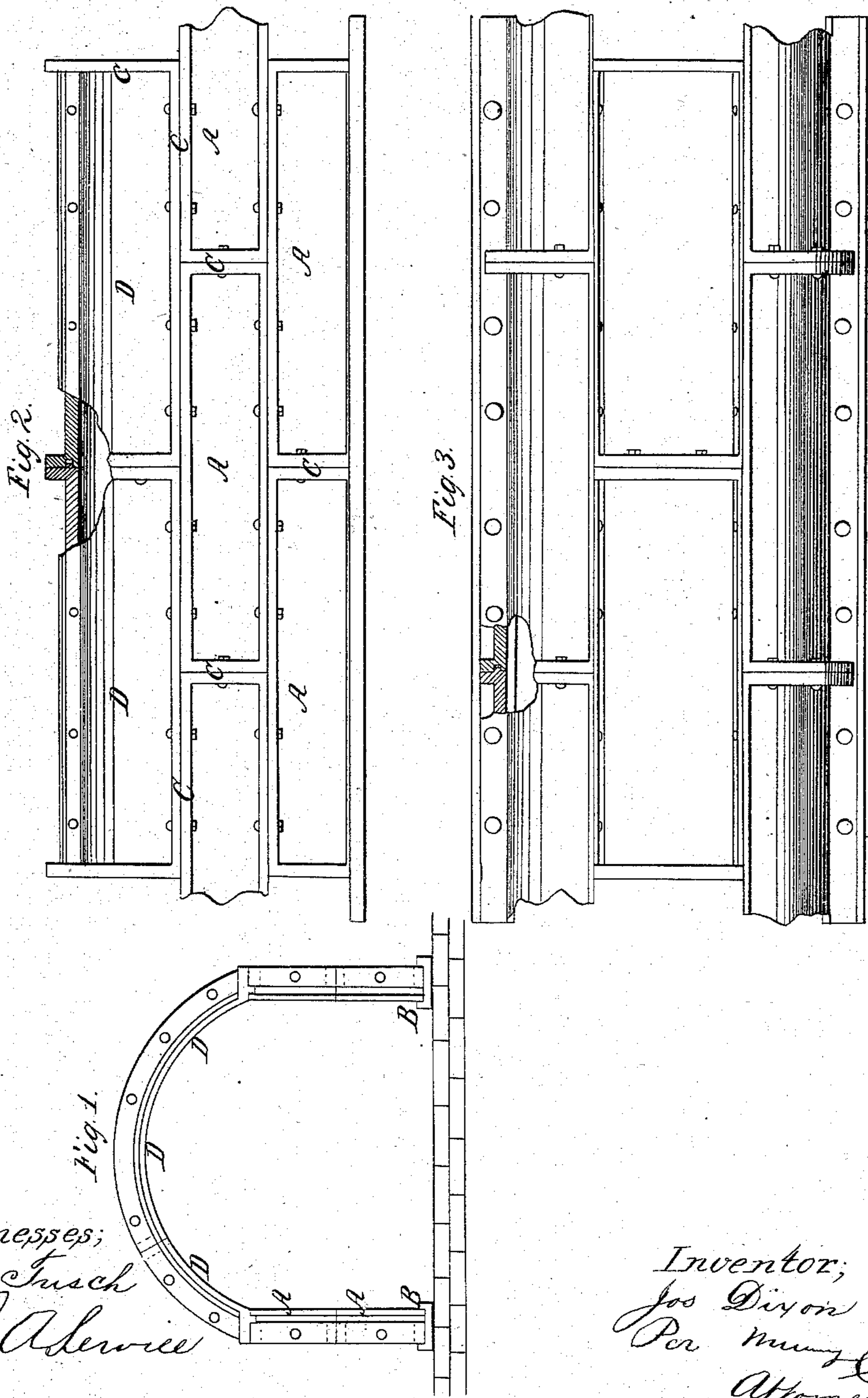


J. Dixon.

Constructing Tunnels.

N^o 67,849.

Patented Aug. 20, 1867.



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JOSEPH DIXON, OF NEW YORK, N. Y.

Letters Patent No. 67,849, dated August 20, 1867.

IMPROVEMENT IN TUNNELS.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, JOSEPH DIXON, of the city, county, and State of New York, have invented a new and useful Mode of Constructing Cast-Iron Tunnels for underground railroads; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is an end elevation of my improved mode of constructing tunnels for underground railroads, &c.

Figure 2 is a side elevation of the same.

Figure 3 is a plan view of the same.

Similar letters denote like parts.

The nature of this invention consists in an improved mode of constructing tunnels for underground railroads, sewers, vaults, &c., of any required size, by means of a series of cast-iron plates or slabs, as shown in the accompanying drawing, around each of whose edges is a strong rim or flange, by which these plates are securely bolted together, as more fully described hereinafter, the sides resting in a groove on a foundation of masonry.

In figs. 1 and 2, A A represent the side plates or slabs of the tunnel, which may rest on any suitably prepared foundation. The plates or slabs A A are cast with a strong rim or flange, C, around each of them, and are tongued and grooved, as shown in parts broken away in figs. 2 and 3. Between all the joints I place a strip of rubber, felt, or other pliable substance in order to secure a perfectly tight joint when the bolts and nuts are screwed up tight. The roof-plates D of the tunnel are cast in curves or parts of a circle, so as to form an arch of the required radius to span the tunnel, the centre plate acting as the key of the circle.

In order to construct a tunnel according to my plan, some of the plates or slabs A are set up edgewise on the foundation, and their ends bolted together. I then place another series of plates or slabs A on top of each of the plates before set, and bolt the lower flanges thereof to the flanges of the plates before set, and I thus complete the sides of the tunnel. A movable frame, arched on the top like the tunnel, is then wheeled between the sides, and the arch plates or slabs placed on the top of the framework, one by one, and their flanges bolted together. This framework being made so as to be raised or lowered as may be required by means of a screw-jack, will be raised slightly above the sides while the flanges of the arch-plates are being bolted together, and when the arch is ready the framework is to be lowered till the arch rests in its place on the sides A. The arch and sides are now to be bolted securely together, and the framework wheeled out; the arch is then complete, the centre plate acting as the key, and the flanges of every joint acting as a powerful strengthening rib on the outside. The joints inside the tunnel thus formed will be flush with each other, and will have the appearance of being cast in one piece like a cylinder, so that nothing can lodge in the same if chosen to be used as a sewer, water pipe, or culvert. I break joint in the centre of each plate or slab, as shown in figs. 2 and 3. By thus varying the line of jointing I gain great additional strength to the whole structure. The means of ventilation will be through iron air-shafts from the tunnel to the surface of the street, rising in the form of an obelisk or column of open lattice-work.

By the means herein described a tunnel of unlimited dimensions can be made with great rapidity, and at a much less cost than mason-work. A tunnel constructed according to my plan, with iron plates one-half inch thick, and with rims or flanges three inches deep, would answer for eighteen inches of masonry, and consequently save a large amount of excavating; also the labor of hauling lime, sand, &c., and of the mixing of the same. The plates would be brought to the place of use with holes drilled for the bolts, and could be set up by ordinary unskilled laborers under the direction of an overseer.

I am aware that it has been proposed to make tunnels by the longitudinal bolting together of short tubes, but this I do not claim. It has been the study of engineers for a long time to find some simple, cheap, and water-tight arrangement for the purpose of constructing a tunnel for underground roads, and also for large sewer and water pipes. The difficulty of casting a cylinder of large dimensions is well known to all experienced engineers, owing to the thinness of metal required for such purposes, which is apt to chill in the moulds and produce flaws, even under the most favorable circumstances. By the use of my improvement I form the tunnels of separate plates, cast in such a manner and of such size and form that they can be easily handled, while good

sound castings can always be insured at a low cost. By my mode of constructing tunnels, I can also construct sewers or water pipes very cheaply, of any desired form or any required diameter.

I claim as new, and desire to secure by Letters Patent—

A subterranean or submarine tunnel, the walls and roof of which are constructed of rectangular metallic plates, each one of which has a lip or flange turned up around its four edges, the plates being bolted together through the flanges, arranged so as to break joints, and packed tightly at the seams, substantially in the manner and for the purpose specified.

JOSEPH DIXON.

Witnesses:

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