No. 852,916. PATENTED MAY 7, 1907.

F. F. VANDEVORT.

TUNNEL SEGMENT.

APPLICATION FILED MAY 22, 1906.

Fig. 1.

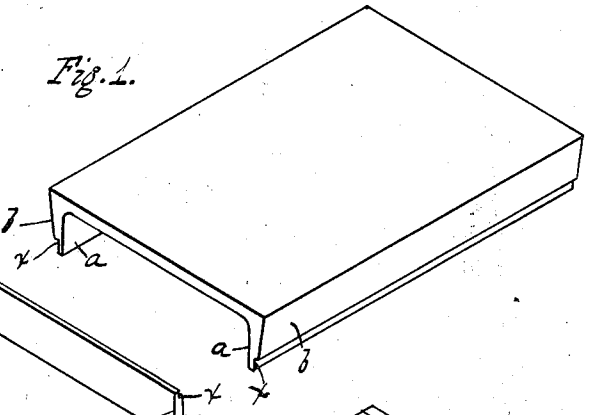


Fig. 4.

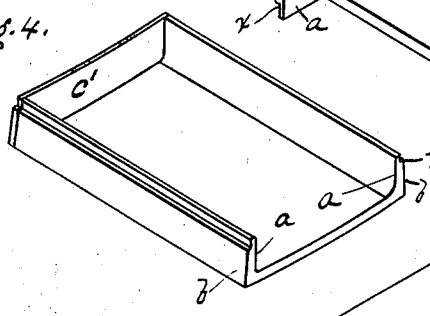


Fig. 2.

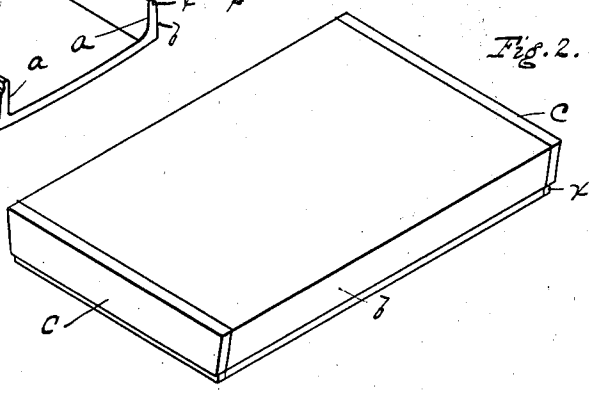
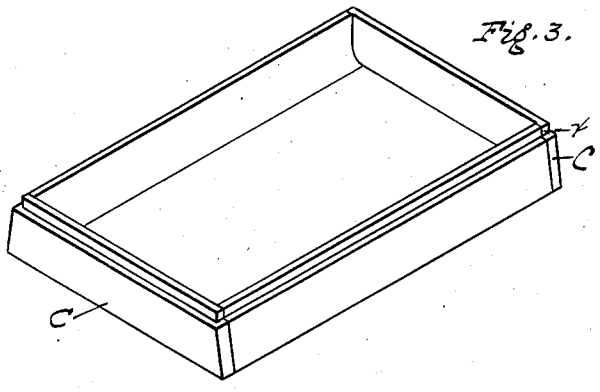


Fig. 3.



WITNESSES

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UNITED STATES PATENT OFFICE.

FRANK F. VANDEVORT, OF GERMANTOWN, PENNSYLVANIA, ASSIGNOR OF ONE-FOURTH TO HENRY JAPP, OF NEW YORK, N. Y., ONE-FOURTH TO JAMES FORGIE, OF RICHMOND HILL, NEW YORK, AND ONE-FOURTH TO ERNEST W. MOIR, OF LONDON, ENGLAND.

TUNNEL-SEGMENT.

No. 852,916. Specification of Letters Patent. Patented May 7, 1907.

Application filed May 22, 1906. Serial No. 318,242.

To all whom it may concern:

Be it known that I, FRANK F. VANDEVORT, a citizen of the United States of America, residing in Germantown, in the county of Philadelphia, in the State of Pennsylvania, have invented certain new and useful Improvements in the Manufacture of Tunnel-Segments, of which the following is a specification.

My invention relates to improvements in the manufacture of wrought iron or steel segments for lining tubular tunnels, which form the subject of Letters Patent No. 806,673, granted to Henry Japp, December 5th, 1905.

The object of my invention is to produce an economical and efficient wrought iron or steel segment for the purpose in question.

In the accompanying drawings Figure 1 is a perspective view showing the first step in the production of the article; Fig. 2 is a similar view showing a next step in the process; and Fig. 3 is a perspective view of the segment looked at from the other side; and Fig. 4 is a perspective view showing a modified form of segment partially completed.

In carrying out my invention, I first roll a channel of about the section illustrated in Fig. 1, and of a width equal to either the length or breadth of the desired segment. The channel may be rolled of a sufficient length to cut two or three or more segment blanks from it. The inner faces *a*, *a*, of the channel are rolled to be parallel with each other, while the outer faces *b*, *b*, are inclined toward each other from the web side of the channel toward the edges of the flanges. The inclination is such that when adjacent segments are fitted together, those faces will lie in planes radiating from the axis of the tunnel.

I prefer to roll the channel with edge grooves *x* on the flanges (Fig. 1), for the usual calking strips along the flanges of the segments. The web of the channel may be rolled flat, as in Figs. 1, 2 and 3, or curved as in Fig. 4.

I prefer to roll the channel of such size that its width shall constitute the width or length of the segment measured circumferentially of the tunnel when the finished segments are in place. The channel having been cut or rolled to the proper length, I then provide end pieces C, C, of the proper size and by electrical means or otherwise I weld these end plates to the opposite ends of the web and flanges of the channel bars to make the tunnel segment with flanged ends as well as flanged sides. These end pieces may have straight edges, as in Figs. 1, 2 and 3, or curved as at C^1 in Fig. 4, according as the web of the channel or bottom segment is flat or curved.

By the described method of operation I am enabled to produce economically wrought iron or steel flanged tunnel segments with sharp corners, calculated to successfully stand the strain, stresses, and pressures to which tunnel segments may be subjected in use.

I claim as my invention

1. The herein described tunnel segment, consisting of a channel bar with plates welded to the ends of the web and flanges of the channel.

2. The herein described tunnel segment, consisting of a channel bar with the inner faces of the flanges parallel to each other, and the outer faces inclined and with plates welded to the ends of the web and flanges of the channel.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses.

FRANK F. VANDEVORT.

Witnesses:

EDNA W. COLLINS,

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