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A. W. SULLIVAN & W. RENSHAW.

METAL BOX BEAM.

APPLICATION FILED DEC. 10, 1904.

Fig. 1.

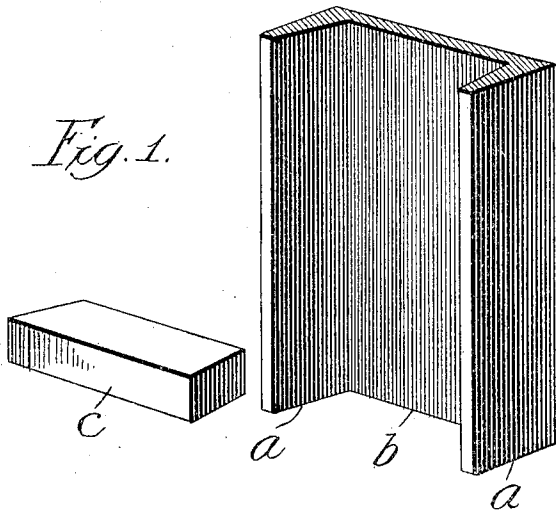


Fig. 2.

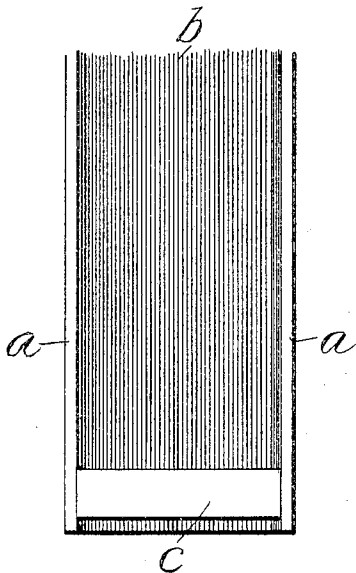
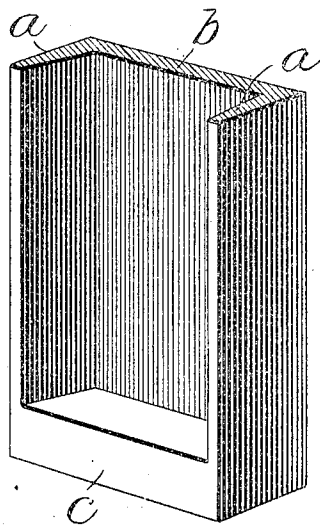


Fig. 3.



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UNITED STATES PATENT OFFICE.

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METAL BOX-BEAM.

No. 810,001.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that we, ALBERT W. SULLIVAN, residing in the city of St. Louis and State of Missouri, and WILLIAM RENSCHAW, residing in Chicago, county of Cook, and State of Illinois, citizens of the United States, have invented certain new and useful Improvements in Metal Box-Beams, of which the following is a specification.

This invention relates to that class of metal channel-beams, which may be termed "box-beams," as used in connection with structural work—such as railway-cars, steel ships, and the metal skeletons of modern office-buildings—and particularly to the construction of the ends of such beams, as will more fully hereinafter appear.

The principal object of the invention is to provide a new article of manufacture—viz., a wrought-metal box-beam with flanged ends welded into integral connection with the sides and web portions, so as to make the whole structure capable of withstanding the immense stress of modern conditions.

Other and further objects of the invention will appear from an inspection of the drawings and the following description and claim.

The invention consists principally in a new article of manufacture—viz., a wrought-metal box-beam provided with flanged ends, formed by the insertion of separate blocks between the web and side flanges and welding all of such parts together while in a heated condition.

The invention consists, further, in the features, combinations, and details of construction hereinafter described and claimed.

In the accompanying drawings, Figure 1 is a perspective view of a wrought-metal beam and separate block as both parts appear before the operations of forming the end flange; Fig. 2, a front elevation of one end of a wrought-metal channel-beam as it appears when the end block is inserted in position and before the welding operation has been performed, and Fig. 3 a perspective view of one end of a channel or box beam as it appears when the operations are completed.

In the art to which this invention relates it is well known that the production of a satisfactory metal post, particularly for railway-cars, has long been desired, one that could be secured to the underframe and car-roof in a satisfactory manner, so as to withstand the

stress and strains incident to the use thereof. The usual methods now in vogue have been to secure the posts in position by bending the flanges or web portion, or both, outwardly or inwardly and riveting or otherwise securing them in position or by upsetting all of such parts into one piece, so as to form a base or head. While these methods may meet some of the requirements, they are objectionable, in that the cross-sectional value of the beam is impaired at the point of securing it to the other parts, and, further, on account of the expense entailed in the making of these beams by either of such methods. Other methods have also been used, none of which seems to answer the modern requirements as to economy of manufacture and strength in use. The principal object, therefore, of this invention is to provide a box-beam that will be as strong, if not actually stronger, at its end flanges than at any other point, so that the point of attachment to other parts will equal, if not excel in strain-resisting functions, the rest of the structure, all of which will more fully hereinafter appear.

In constructing a wrought-metal box or channel beam in accordance with these improvements we take a wrought-metal channel-beam—that is, a structural metal beam having side flanges *a* joined together by an integral web portion *b*. To provide means by which this beam may be secured in position so that it can be efficiently used as a post in railway-cars, steel ships, and modern buildings end flanges *c* are provided, formed as hereinafter set forth. The means for forming the end flanges of these beams and making them substantially integral therewith consists in taking a separate block or blocks *c*, as shown in Fig. 1, and inserting one at each end of the channel-beam between the side flanges and web portion, as shown particularly in Fig. 2. The parts are then placed in a forge or furnace and raised to a welding heat, after which they are placed in a suitable swaging-machine, commonly called a "bulldozer." This type of machine is well known in the art and is provided with a die of the same contour as the finished beam. The plungers of the bulldozer are then operated to compress the parts together in what is generally termed a "swaging" operation—that is, they crowd or swage the ends of the side flanges and web and separate piece to-

gether, so that, in effect, when the parts are cool the point where the separate block, web, and side flanges are connected together will resist stress and strains to a greater extent
5 than any other portion of the beam or beams. Stated otherwise, we have found that by subjecting the end flange of the completed beam to repeated hammer actions it will resist the same, but that the side flanges will break
10 long before any sign of rupture occurs at the point where the parts are connected together.

The principal advantages incident to the use of these improvements are simplicity and economy of manufacture, and, further, that
15 the end flanges may be of any desired thickness without upsetting or disturbing any part or portion of the beam, which is the case in all other instances of which we have knowledge. Stated otherwise, it will be noticed
20 that no cutting, drawing, or upsetting of the channel-beam to any substantial amount is necessary to complete a box-beam in accordance with these improvements, all of which

will be understood and appreciated by those skilled in the art. 25

We claim—

As a new article of manufacture, a wrought-metal channel-beam having on one or each end a head or base portion composed of a separate block, inserted between the flanges 30 and web of the channel-beam, and with the same welded into an integral solid body, said block having its lower face in the plane of the end of the channel-beam and its outer side in the plane of the outer sides of the flanges of 35 the beam.

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