

R. V. SAGE.
CONSTRUCTION OF METAL SILLS.

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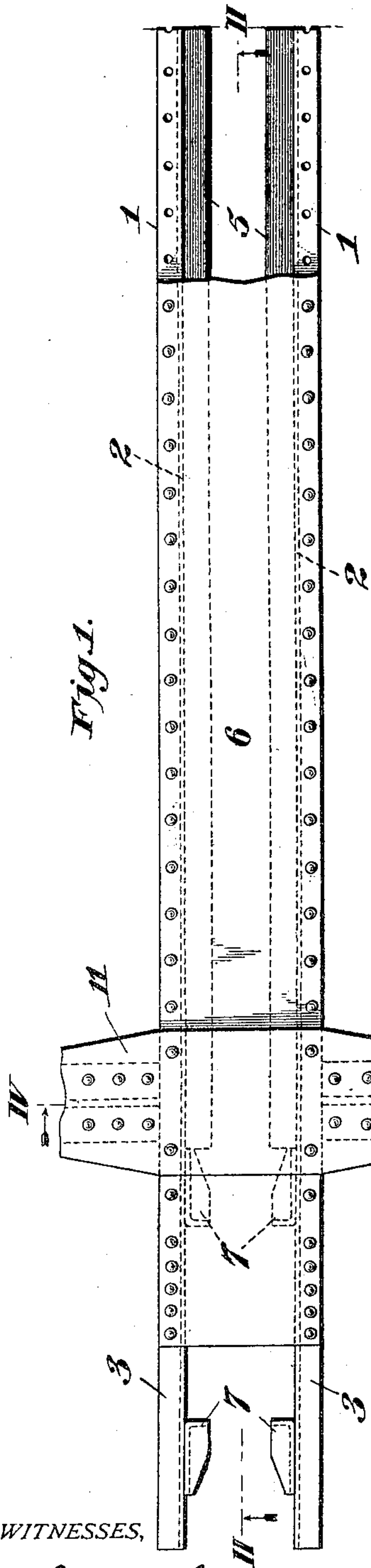


Fig. 1.

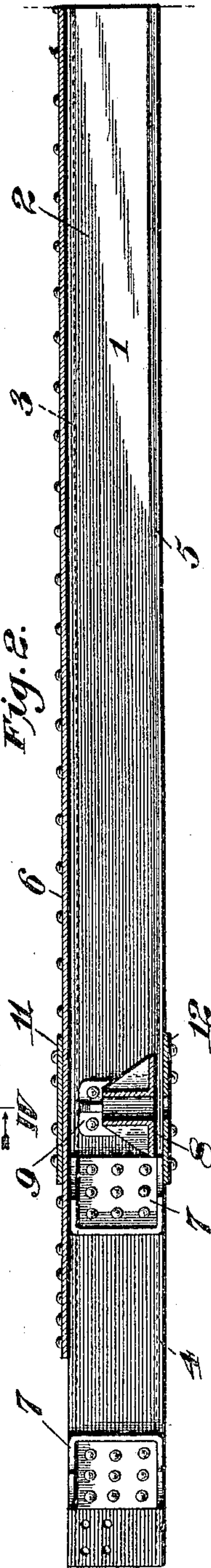


Fig. 2.

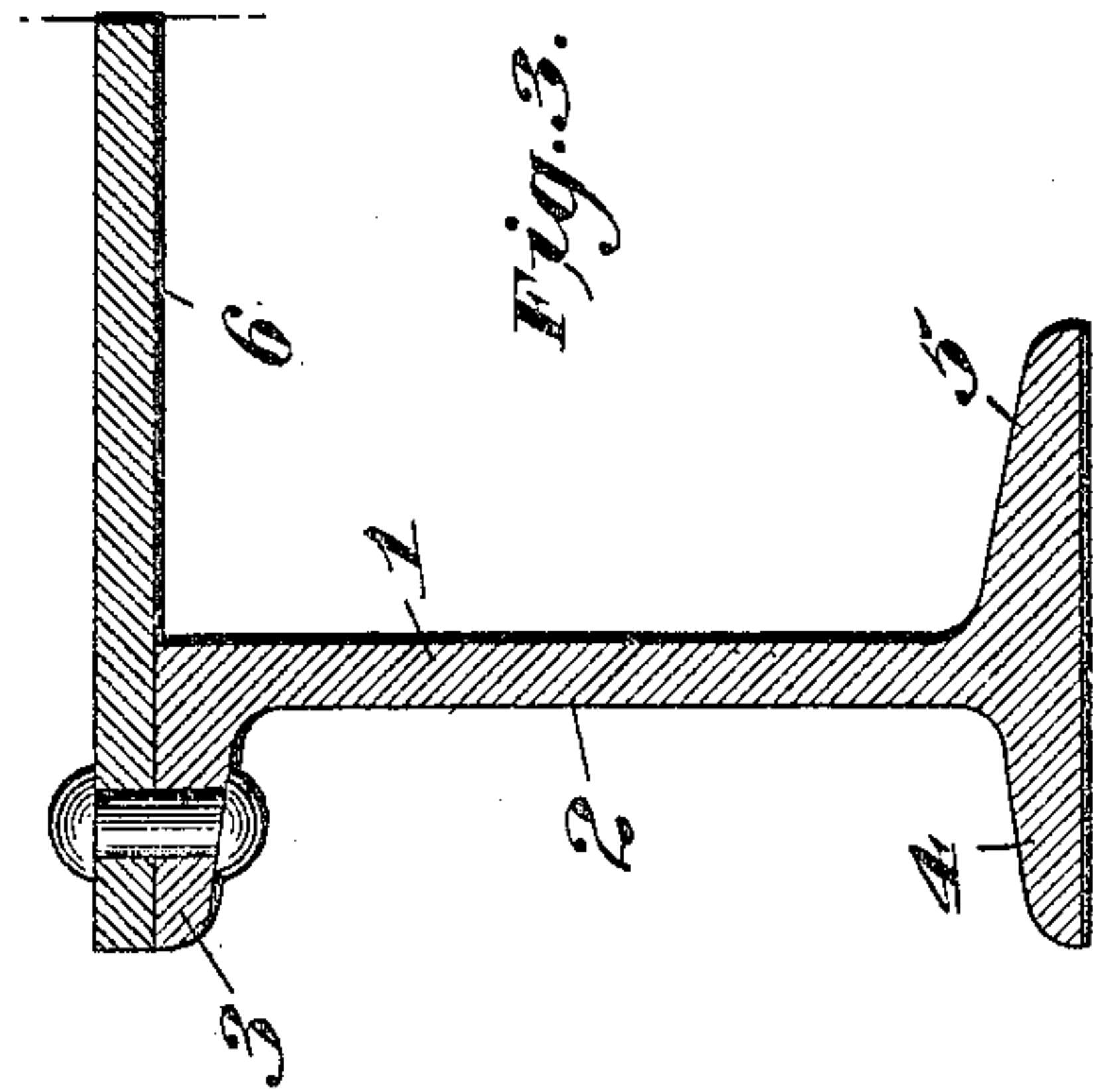


Fig. 3.

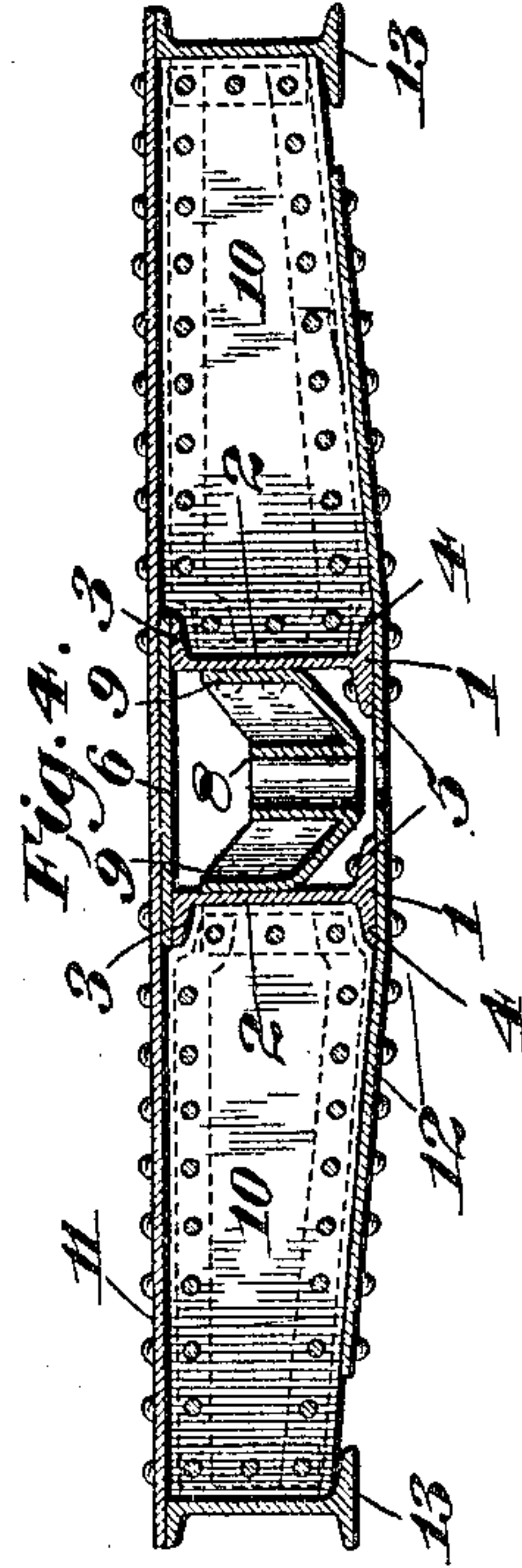


Fig. 4.

WITNESSES,

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UNITED STATES PATENT OFFICE.

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CONSTRUCTION OF METAL SILLS.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, RALPH V. SAGE, a citizen of the United States, residing in the borough of Westmont, in the county of Cambria and State of Pennsylvania, have invented certain new and useful Improvements in the Construction of Metal Sills; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates in general to the construction of metal sills, and more especially to such as are used in the construction of underframes for railway-cars and the like.

It has for its objects to provide a sill of the above-described class formed from a plurality of bars, each comprising a web and a single integral flange at one edge and oppositely-disposed integral flanges at the other edge, either with or without a cover-plate, which sill is open at the bottom and still has a neutral axis of its cross-section, substantially coincident with its geometric axis, whereby the weight, and hence the cost, of such a sill is reduced without decreasing its strength. Heretofore it has been the practice to form such sills by riveting up a number of plates and bars of various sections or by pressing the same into the desired form from plates, both of which processes are expensive, the former in consequence of the cost of the excessive amount of punching and riveting and the material involved and the latter in consequence of the expensive machinery and dies required and the cost of maintaining the same. The sill of the present invention contemplates no such expensive methods. It is formed simply of a plurality of rolled bars of above-described cross-section, which are punched and sheared in the desired manner and united by a cover-plate in the usual way. By such a construction the amount of material and the labor involved are reduced to a minimum and the sill at the same time increased in its efficiency.

An embodiment of the invention is shown in the accompanying drawings, in which like characters of reference designate like parts.

Referring to the drawings, Figure 1 is a plan view of a portion of the underframe of a car, showing the invention and the manner of applying the same. Fig. 2 is a longitudinal sectional elevation taken on a plane indicated by line II II of Fig. 1. Fig. 3 is a transverse sectional elevation of one-half of the sill,

on an enlarged scale, showing the bar of novel cross-section and the manner of combining the cover-plate therewith. Fig. 4 is a sectional elevation taken on a plane indicated by line IV IV of Fig. 1, showing the bolster and the center and side sills of the underframe and the manner in which they are assembled.

Referring now to Fig. 3, a bar 1 is provided, which consists of a web 2, an integral flange 3, located at one edge, and oppositely-disposed integral flanges 4 and 5, located at the other edge thereof. The flanges 3 and 4 on the same side of the web for convenience in rolling are preferably of the same cross-section, although not necessarily so. Either may be larger than the other, as the occasion demands. The flange on the opposite side of the web, however, is preferably larger in cross-section than either of the other two. The location of flanges 4 and 5 may be interchanged, if it is so desired, although the preferable construction is as shown. By using this special form of flanged bar I reduce the amount of work necessary in making a car-sill and also dispose the material in the best manner to resist the stresses, as the flanges are integral with the web, and thus the flange-section is at the greatest distance from the neutral axis, in all of which respects it is better than a built-up or riveted section, as will be understood by one skilled in this art.

In the construction of a central longitudinal sill for the underframe of railway-cars and the like a plurality of bars of the above-described cross-section are arranged with their webs vertical, and said bars are united in any desired manner, preferably by means of a cover-plate 6, which is secured to the single flanges 3 at the upper edges thereof by means of rivets. My center sill is usually formed of two such bars, which are so spaced apart that their inner flanges do not abut, thus leaving an opening at the bottom. In a gondola car having a hopper-bottom such a construction is especially desirable, since it permits the door-operating mechanism usually placed between these bars 1 of the center sill to be inspected, painted, and repaired and also avoids cutting the lower members to provide openings for the door-connecting means. It will readily be seen that the cross-section of such a sill is made more nearly symmetrical by the use of a bar of unsymmetrical cross-section, as above described, than if channels or other bars of symmetrical cross-section were used. By making a sill of bars having a single flange

at the top and two at the bottom, one of which is preferably larger than the other, the metal in the cover-plate located at the top is compensated for in such a manner that the neutral axis of the combined section is more nearly coincident with the geometric axis thereof, whereby the maximum strength is combined with the minimum material and a sill is produced in which the minimum amount of labor is involved.

Secured to the ends of the bars 1, forming the center sill, are the usual follower-plate lugs 7, which are located on the inside thereof. The lower inner flanges 5 are cut away, as shown, at that portion adjacent to the lugs 7 and extending from a point near the bolster to the end of the sill to permit the draft-rigging (not shown) to be put in and replaced as required. A strut 8 having integral lugs 9, by which it is secured to the bars 1, is located at each end of the sill in the usual place and provides a bearing for the king-pin and a reinforcement for the center bearing-plate, which latter is not shown for convenience of illustration. Located opposite the strut 8 and on each side of the sill are the bolster-webs 10, which are secured to the bars 1 and are provided with the cover-plates 11 and 12, thus forming the body-bolster of the car. The bolster-webs may be formed of plates properly shaped and having flanged bars secured thereto, as shown, or they may be pressed from plate metal or cast, as desired. Side sills 13 are secured to the body-bolsters in the usual manner and are preferably formed of bars of my novel cross-section above described.

In view of the above the advantages of my improved car-sill are apparent. A car-sill is provided which is formed of a plurality of bars having integral flanges, thereby reducing the cost of punching and riveting and the handling of a number of separate pieces and also the cost of the excessive amount of material required in a riveted structure. By means of my construction a central longitudinal car-sill is provided which is open at the bottom, permitting the interior walls thereof to be painted and inspected. In case the sill is used in cars having bottom doors a suitable housing for the door-operating mechanism is provided, which mechanism is readily accessible for inspection and repair. The bottom being open also avoids the necessity of weakening the sill by cutting openings for the door connections.

Although in the drawings and descriptions herein of my improved center sill I have shown a comparatively narrow cover-plate 6, I can in case metal floor-plates are employed dispense with the cover-plate 6 and rivet the floor-plates directly to the upper flanges of the sills, these floor-plates thus serving a double purpose—viz., to support the load directly and to form the top flange of the center sill. In case metal floor-plates are used I

can also secure them to the cover-plate and the upper flanges of my flanged bars, said floor-plates in this case being preferably riveted by their edges to the upper surface of the edges of the cover-plate and the upper flanges of the bars by rivets passing through these three thicknesses of material, or, again, I may secure the edges of the floor-plates between the cover-plate and the upper flanges of my flanged bars.

A variety of modifications of my invention will readily suggest themselves. Hence it is not the intention to limit this application to the precise form shown herein, but to have it construed as broadly as it merits.

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

1. In a car-sill, the combination of a plurality of metal bars, a plate securing the tops thereof together, each of said bars comprising a vertical web, top and bottom integral flanges extending outwardly, and a bottom integral flange extending inwardly, whereby the neutral axis of the combined section, parallel with the flanges of said bars, coincides approximately with the geometric axis thereof.

2. In a car-sill, the combination of a plurality of metal bars, each comprising a web having a single integral flange at one edge and oppositely-disposed integral flanges at the other edge, a plate uniting said bars at the edge having the single integral flange, whereby the neutral axis of the combined section, coincides approximately with the geometric axis thereof.

3. In a longitudinal car-sill, the combination of a plurality of metal bars and means for securing the same together, each of said bars comprising a web, top and bottom integral flanges of equal cross-section extending outwardly and a bottom integral flange of an unequal cross-section extending inwardly.

4. In a longitudinal car-sill, the combination of a plurality of metal bars and one or more cover-plates for uniting the same, each of said bars comprising a web, top and bottom integral flanges extending outwardly and a bottom flange of larger cross-section than said bottom flange extending inwardly.

5. In a longitudinal car-sill, the combination of two metal bars and one or more cover-plates and struts uniting the same, each of said bars comprising a web, top and bottom integral flanges of equal cross-section extending outwardly and a bottom integral flange of larger cross-section extending inwardly.

6. In a longitudinal car-sill, the combination of a plurality of metal bars each comprising a web, top and bottom integral flanges extending outwardly throughout its length and a bottom integral flange extending inwardly for a portion of its length.

7. In a longitudinal car-sill, the combination of two metal bars, with one or more cover-

plates and struts uniting the same, each of said bars comprising a web, top and bottom integral flanges extending outwardly throughout its length and a bottom integral flange extending inwardly for a part of its length at the central portion.

8. In a longitudinal car-sill, the combination of two metal bars, a cover-plate, a strut having a hole for the king-pin, and follower-plate lugs secured to said bars near the ends thereof, each of said bars comprising a web, top and bottom integral flanges extending

outwardly throughout its length, and a bottom integral flange extending a portion of its length and inwardly, the ends of said inwardly-extending flanges being cut away adjacent the follower-plate lugs.

In testimony whereof I hereto affix my signature in the presence of two witnesses.

RALPH V. SAGE.

Witnesses:

ELMER SEAVEY,

CHAS. N. CHAMBERS.