(No Model.)

W. ORR.

FIREPROOF CONSTRUCTION.

No. 504,537. Patented Sept. 5, 1893.

Fig. 1.

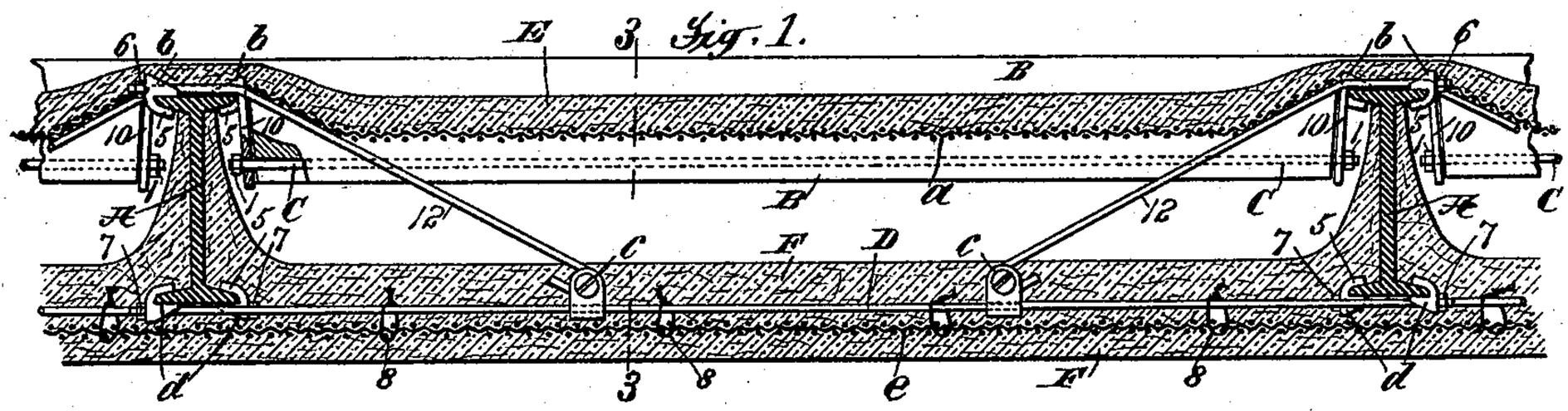


Fig. 2.

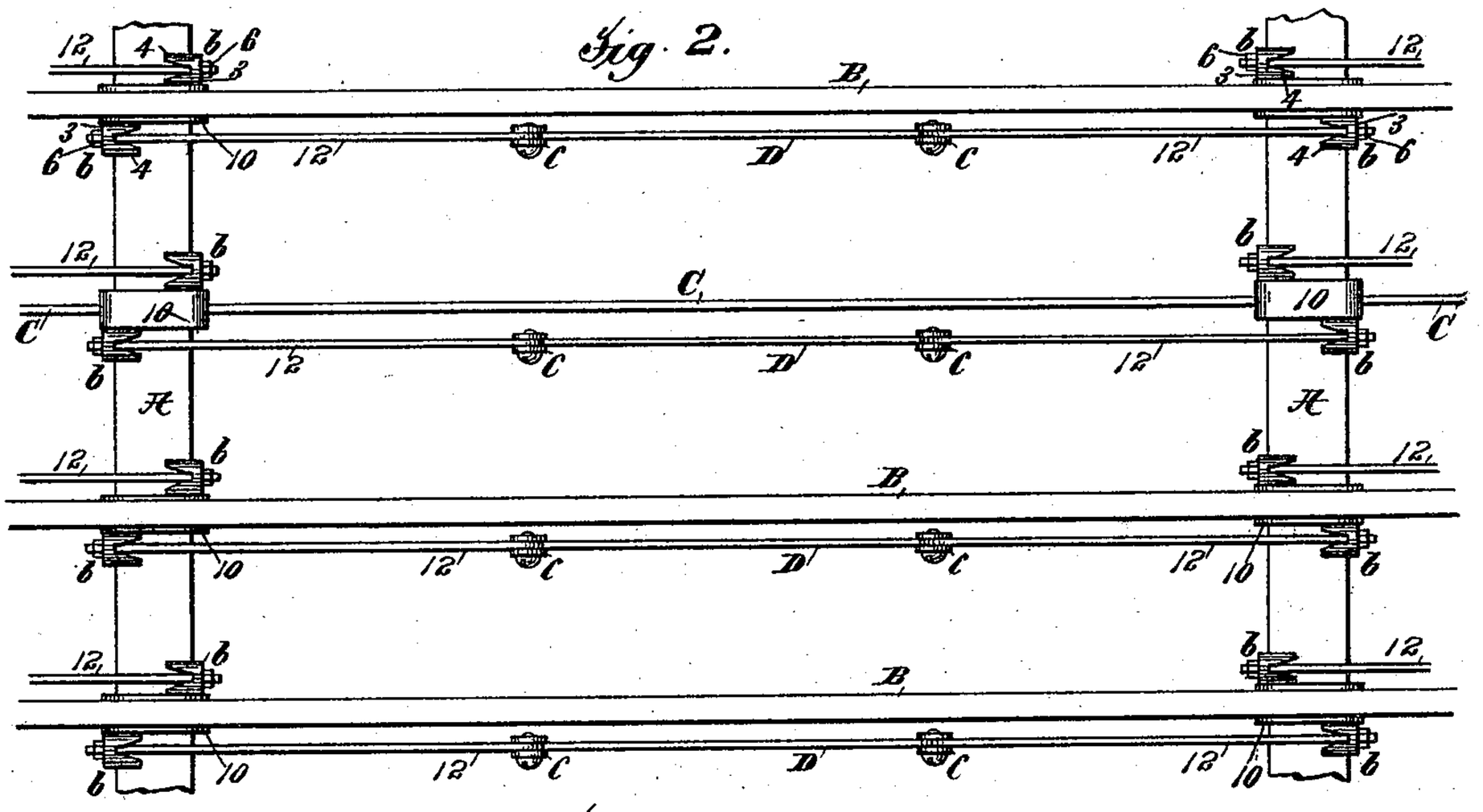


Fig. 3.

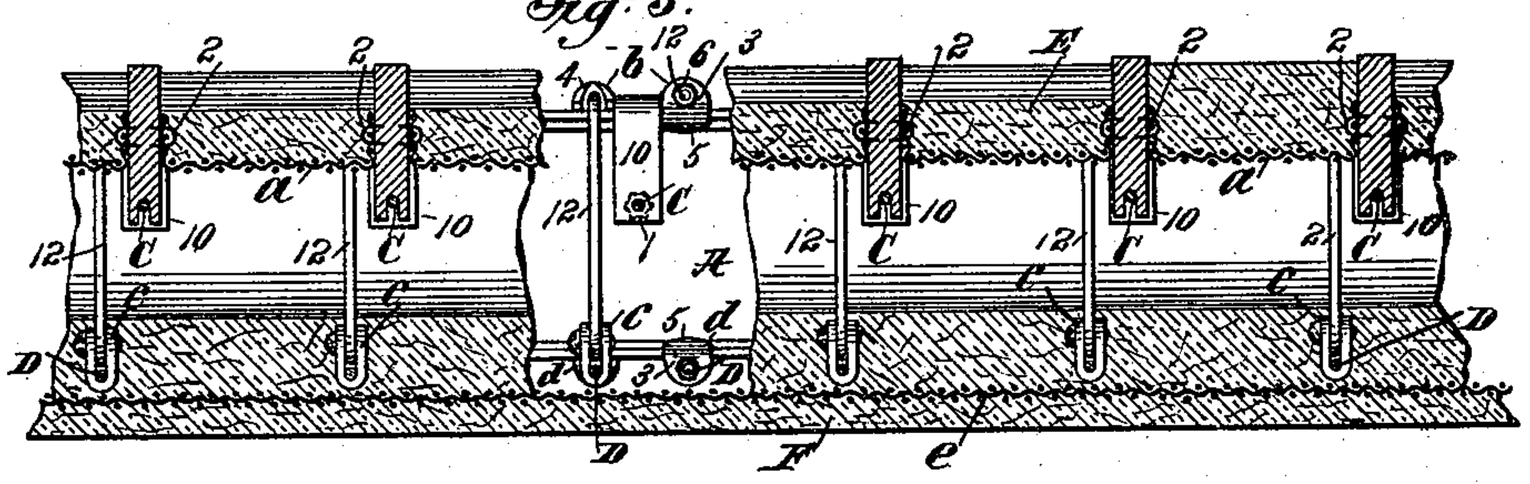
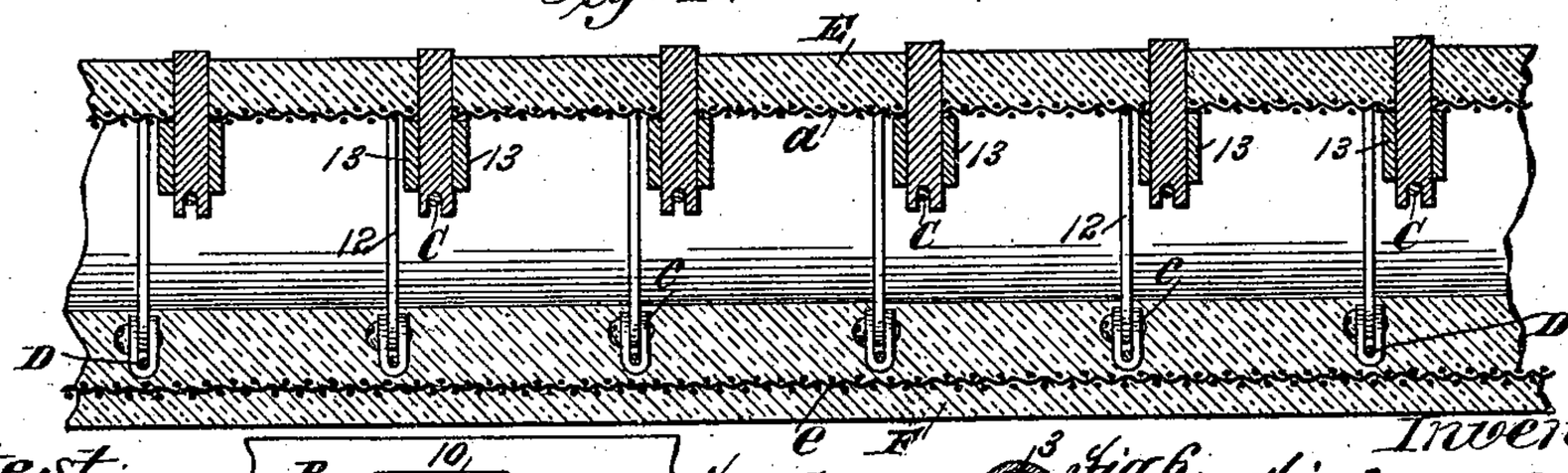


Fig. 4.



Attest:
Geo. H. Potts.
W. H. Kennedy.

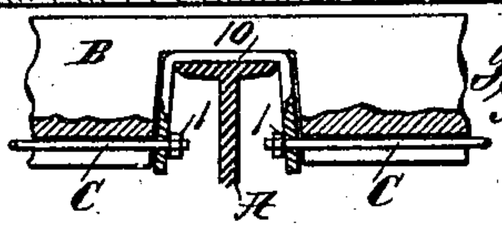


Fig. 5.

Fig. 6.

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UNITED STATES PATENT OFFICE.

WILLIAM ORR, OF TRENTON, NEW JERSEY.

FIREPROOF CONSTRUCTION.

SPECIFICATION forming part of Letters Patent No. 504,537, dated September 5, 1893.

Application filed May 13, 1893. Serial No. 474,063. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM ORR, a citizen of the United States, residing at Trenton, county of Mercer, and State of New Jersey, have invented certain new and useful Improvements in Fireproof Constructions, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

In my Patent No. 471,772, dated March 29, 1892, I have described and claimed a construction in which a series of suspenders extending from beam to beam are supported by the floor beams, and in turn support a fire proof floor and ceiling of cement or similar material.

The present invention relates to structures employing such suspenders, the special object being to decrease the weight and increase the fire proof qualities of such structures.

To this end the invention consists in various constructions and arrangements of parts, all of which will be fully described in the following specification, and particularly pointed out in the claims.

For a full understanding of the invention a detailed description of a construction embodying the same in its preferred form will now be given, reference being had to the accompanying drawings forming a part of this specification, in which—

Figure 1 is a section of a floor and ceiling construction, transverse to the beams, showing one form of the construction embodying the invention. Fig. 2 is a plan view with the cement material removed. Fig. 3 is a cross section on the line 3 of Fig. 1, broken away in part. Fig. 4 is a cross section similar to Fig. 3, showing a modification. Fig. 5 is a detail cross section showing the construction of the joist supporting hangers. Fig. 6 is a detail perspective of one of the clips for supporting the ceiling suspenders from the beams.

Referring to said drawings, A are the floor beams of the usual **I** form, B the joists which preferably extend above the tops of the beams, as shown, and are cut away opposite the beams, so as to extend below the tops of the beams between the latter. C are suspenders by which the joists and floor construction are supported, and D suspenders by which the ceiling construction is supported. The suspenders C are supported from the tops of the beams by hangers 10, which consist in the form shown of angular pieces of metal extending from the tops of the beams, and provided with depending arms on each side of the beam in which the suspenders C are supported by being passed through holes in the arms and secured by nuts 1, so that the suspenders may be secured firmly in position therein. The suspenders C preferably consist of small metal rods upon which the joists B rest, the joists preferably being provided with longitudinal grooves, as shown, in which the rods lie so as to assure their proper position.

The fire proof floor construction is provided by means of sheets of metallic lathing *a*, which may be common wire lathing, as shown, or of any form, this metallic lathing being supported between the joists and preferably as shown in Figs. 1 to 3, the sheets of lathing extending from beam to beam and being attached to the joists in any suitable manner, conveniently by staples or nails 2, as shown, when wooden joists are used. By this means the lathing is properly supported at the desired distance above the lower side of the joists. Upon this wire lathing and between the joists B is the fire proof filling E, consisting of the usual body of cement or similar plastic material, this material preferably extending only part way to the tops of the joists, so as to leave an air space between it and the floor.

The suspenders D are supported from the tops of the beams by supporting rods 12 and clips *b*, which clips are preferably of the form shown in Fig. 6, being provided with a body 3 through which the opening is made for the end of the supporting rod, with arms 4 extending over the top of the beams, and an arm 5 extending underneath the suspender, so as to hold the clip firmly in position. The supporting rods 12 are secured in the clips so as to be drawn tight by nuts 6, and at the other end support the suspenders D by clips *c*, which in the form shown consist of **U** shaped pieces of metal in which the suspenders D lie, and to which the supporting rods 12 are hooked by screws passing through the **U** arms above the suspenders. The ends of the suspenders D are supported from the lower flanges of the beams by clips *d* embracing the lower flanges, and in which the ends of the

suspenders are secured adjustably by nuts 7, so that the suspenders and clips may thus be held tight.

Upon the suspenders D is supported the metallic lathing *e* shown as common wire lathing, although metallic lathing of any form may be used, this lathing being supported from the suspenders in any suitable manner, being shown as supported by wire lacing 8. By the metallic lathing *e* and suspenders D is supported the body of cement or other plastic material F which extends below the lathing to form the ceiling, and above the lathing sufficiently for strength and fire proof qualities, this plastic material also being filled in about the webs of the beams A, and preferably to the top of the web, as shown, so that the top flanges are fire proofed on top by the plastic material E, and wholly or partially underneath the flanges by the material F.

In Fig. 4 is shown a modification in which the construction is the same, except that the sheets of metallic lathing *a* are supported by projections on the sides of the joists, these projections being preferably formed by narrow pieces of board 13 nailed to the joists. In this construction the plastic material is shown as filled to the tops of the joists, so that the floor rests upon the joists and material. It is preferable, when an air space is left above the plastic material E, as shown in Figs. 1 to 3, that an occasional space between the joists be filled to the top, so as to break this air space and prevent draft. This is shown at the right hand of Fig. 3.

In laying the construction shown, the suspenders D are first placed in position with the lathing *e* and the body of plastic material E applied from the top. The hangers 11 and the suspenders D are then placed in position the joists laid on so as to be supported by the suspenders and beams, as shown, the lathing *a* secured to the joists and the body of plastic material E applied, completing the construction ready for the floor. It will be found that this construction provides a very light and efficient fire proof floor and ceiling construction.

It is obvious that modifications may be made in the construction and arrangement of the parts by which the support for the plastic material is provided, without departing from the invention. While it is preferable to use the entire construction shown providing for a light and efficient double fire proof construction, it will be understood that the upper part of the construction providing a fire proof flooring forms in itself a part of the invention, and may be used with other constructions for fire proofing the lower part of the beams and supporting the ceiling, and that certain specific features of the construction, also, form in themselves parts of the invention.

What I claim is—

1. The combination with floor beams and joists supported by said beams and lying partly below the tops of the beams, of a series of joist supporting suspenders supported by the beams and extending from beam to beam, and a body of fire proof material between said joists, substantially as described.

2. The combination with floor beams and joists extending below the tops of the beams, of a series of joist supporting suspenders supported by the beams and extending from beam to beam, and a body of plastic material extending between the joists, substantially as described.

3. The combination with floor beams and joists extending below and above the tops of the beams, of a series of joist supporting suspenders supported by the beams and extending from beam to beam, and a body of plastic material extending over the tops of the beams and between the joists, substantially as described.

4. The combination with floor beams and joists extending below and above the tops of the beams, of a series of joist supporting suspenders supported by the beams and extending from beam to beam, and a body of cement or other plastic material extending over the tops of the beams and between the joists, and having its upper surface below the tops of the joists, substantially as described.

5. The combination with floor beams and joists extending below and above the tops of the beams, of a series of joist supporting suspenders supported by the beams and extending from beam to beam, metallic lathing supported between the joists, and a body of plastic material supported by said lathing, substantially as described.

6. The combination with floor beams and joists extending below and above the tops of the beams, of a series of joist supporting suspenders supported by the beams and extending from beam to beam, metallic lathing supported between the joists, and a body of plastic material extending over the tops of the beams and between the joists and supported by said lathing, substantially as described.

7. The combination with floor beams and joists extending above and below the tops of the beams, of metallic lathing between and supported by said joists, and a body of plastic material extending over the tops of the beams and between the joists and supported by said lathing, substantially as described.

8. The combination with floor beams and joists extending below the tops of the beams, of joist supporting suspenders supported by the beams and extending from beam to beam, a body of plastic material extending between the joists, and a ceiling of fire proof material below the body of plastic material and separated therefrom by an air space, substantially as described.

9. The combination with floor beams and joists extending below and above the tops of the beams, of joist supporting suspenders supported by the beams and extending from beam

to beam, a body of plastic material extending over the tops of the beams and between the joists, and a body of plastic material covering the webs of the beams and extending from beam to beam to form a fire proof ceiling with an air space between the two bodies of plastic material, substantially as described.

10. The combination with floor beams and joists extending below the tops of the beams, of joist supporting suspenders supported by the beams and extending from beam to beam, metallic lathing and plastic material between said joists, suspenders extending between the bottoms of the beams, and a ceiling of metallic lathing and plastic material supported by said suspenders with an air space between the two bodies of plastic material, substantially as described.

11. The combination with beams A and joists B, of joist supporting suspenders C supported by the tops of the beams and extending from beam to beam, metallic lathing *a* between the joists, and plastic material E supported by said metallic lathing, substantially as described.

12. The combination with beams A and joists B, extending above and below the tops of the beams, of joist supporting suspenders C supported by the tops of the beams and extending from beam to beam, metallic lathing *a* between the joists, and fire proof material E extending over the tops of the beams and supported by said metallic lathing, substantially as described.

13. The combination with beams A and joists B, of hangers 10 extending over the tops of the beams and provided with depending arms on opposite sides of the beams, joist supporting suspenders C supported in said hanger arms, metallic lathing *a* extending between and supported by the joists, and plastic material E supported by said lathing, substantially as described.

14. The combination with beams A and joists B, of joist supporting suspenders C supported by the tops of the beams and extending from beam to beam, metallic lathing *a* between the joists, plastic material E supported by said lathing, suspenders D supported at the bottom of the beams, and a ceiling of metallic lathing *e* and plastic material F supported by said suspenders D, substantially as described.

15. The combination with beams A and joists B, of joist supporting suspenders C supported by the tops of the beams and extending from beam to beam, metallic lathing *a* extending between the joists, suspenders D supported at their ends by the lower flanges of the beams, and suspender supporting rods 12 connected to the suspenders D between the beams and supported from the tops of the beams, substantially as described.

16. The combination with beams A and joists B, of joist supporting suspenders C supported by the tops of the beams and extending from beam to beam, metallic lathing *a* extending between the joists, suspenders D extending between the bottoms of the beams and supported from the lower flanges of the beams by clips *d*, and supporting rods 12 connected to the suspenders D between the beams and supported from the tops of the beams by clips hooked over the flanges of the beams, substantially as described.

17. The combination with beams A and suspenders D extending between the beams and supported at their ends by the lower flanges of the beams, of suspender supporting rods 12 connected to the suspenders between the beams and supported from the upper flanges of the beams G by clips *b* provided with arms 4, 5, respectively above and below the flanges, substantially as described.

18. The combination with beams A and suspenders D, of clips *d* engaging the lower flanges of the beams and supporting the suspenders at their ends, U shaped clips C embracing the suspenders D between the beams, suspender supporting rods 12 hooked to said clips, and clips *b* engaging the upper flanges of the beams and to which the suspender supporting rods are connected, substantially as described.

19. Clip *b* having the arms 4, 4, adapted to extend over the top of the beam flange, opening 3 between said arms, and arm 5 adapted to engage the under side of the flange, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

WILLIAM ORR.

Witnesses:
JAMES J. WILSON,
H. N. CORNING.