The invention described herein, if patented, may be manufactured and used by or for the Government for governmental purposes, without the payment to me of any royalty thereon.

This invention relates to sectional open-web beams, and particularly to beams for use in supporting canvas tent covers and the like.

In the Department of Defense it is of paramount importance that the structural elements to be used in supporting tent coverings be of light weight for handling and transportation purposes, and also that they be of such simple construction that they may be readily and quickly assembled and disassembled without the use of tools and by a single individual.

Accordingly, it is a primary object of the present invention to provide an open-web sectional beam of light-weight tubular material in which the sections are of such length and weight that they may be easily handled and manipulated and the connections for which are such that the sections may be quickly assembled or disassembled, all without the use of tools or excessive manpower.

Other objects and advantages of the invention will be apparent from the following description taken in connection with the attached drawings, in which,

Figure 1 is a plan view of one of the novel sectional open-web beams;

Figure 2 is a fragmentary side elevational view thereof on an enlarged scale;

Figure 3 is a sectional view through two of the adjacent sections about to be brought to interlocking relationship;

Figure 4 is a vertical section through the two sections after they are interlocked;

Figure 5 is an enlarged fragmentary detail view showing two adjacent beam sections about to be moved longitudinally into position for rotation into interlocking relationship;

Figure 6 is an enlarged fragmentary end view of the interlocking rail of one of the sections;

Figure 7 is a fragmentary plan view showing the connection between the adjacent ends of a pair of lower rails, and,

Figure 8 is a fragmentary side elevational view of a modified construction.

In the present illustration of the invention the open-web beam is shown as formed of four detachably connected sections A, B, C and D which are adapted to be rotatably interlocked and secured in position as a unitary structure.

Each section A, B, C and D are identical and a description of one of them will suffice. Each section is composed of an upper rail 1 and a lower rail 2, and in Figure 2 these rails which are arranged in parallel relationship, are connected and reinforced by the angularly arranged brace bars 3 which are welded at their respective ends to the spaced rails as indicated generally by the numeral 4.

The upper rail 1 is of hollow tubular construction and is reinforced at one end by means of an external metal ring 5 permanently secured to the external surface of the rail directly at one end thereof. Formed on this end of the tubular rail 1 and extending part way into the inner surface of the ring 5 is a longitudinal groove 6 which is carried beyond the ring into the exposed portion of the rail as indicated by the numeral 7 and terminates in an angular slot 8 forming in effect a bayonet slot for interconnection with a pin 9 mounted adjacent the opposite end of the rail 1. Received in this opposite end of the rail 1 and secured therein by rivets 10 is a plug or the like 11 which extends externally of the rail and carries the pin 9 just referred to. The diameter of the plug 11 corresponds approximately to the inner diameter of the rail 1, and the pin 9 is spaced from the end of the plug 11 a distance corresponding to the distance of the angular slot 8 from the adjacent end of the rail 1. Consequently, in interlocking adjacent sections of the beam the pin 9 and plug 11 are brought into alignment with the bayonet slots 6-7 by suitably rotating the adjacent sections and the sections are moved longitudinally so that the pin 9 passes into the bayonet slot 6-7, and then by relative rotation of the sections the pin 9 is projected into the angular slot 8 thereby rotatably securing these sections against relative longitudinal movement.

In order that the adjacent sections as thus connected may be releasably secured against accidental release, the lower rail 2 of each section is provided at one end with an aperture 12 and the opposite end with a laterally extending pin 13 having a diameter slightly less than the diameter of the aperture 12 and provided on its free end with a gravity latch 14 also of a diameter slightly less than the diameter of the aperture 12.

It will be understood of course that the dimension of the interlocking slot 8 of the bayonet joint which extends circumferentially of the rail 1 is such that when the pin 9 is rotated into its final position within the slot 8 the lower rails of adjacent sections are simultaneously brought into overlapping contact as indicated in Figures 3 and 4. Also, it will be understood that as the rail 2, which carries the gravity latch 14, approaches the aperture 12 the latch 14 will be held in substantial alignment with the pin 13 so that the latch may be threaded into the aperture 12. As the rails 2 are brought into final position the latch 14 will have passed entirely through the aperture 12 and will thus be free to fall by gravity into the interlocking position as shown in Figure 4, thereby locking the bayonet joint in closed position. It will also be understood that the term bayonet joint as used in the specification and claims is intended to include any type of coupling in which the sections can be firmly interlocked by a relatively slight rotary movement.

The modified construction of the open-web sectional beam shown in Figure 8 is substantially identical with that heretofore described except that the upper and lower rails are shown as connected and reinforced by a unitary curved brace member 15, the curved portion of which may be welded to the rails as indicated by the numerals 16.

From the foregoing description taken in connection with the accompanying drawings, it will be apparent that we have devised a lightweight sectional open-web beam in which the sections are such that they may be easily manipulated by a single individual, that they may be securely locked in their operative position by a slight relative rotation of the adjacent sections, and that they are automatically locked against inadvertent separation as they are rotated into such locking position.

In accordance with the patent statutes I have described the preferred forms of the invention, but it is obvious
that changes may be made in structural details without departing from the essence of the invention as described herein, and it is intended that such changes be included within the scope of the appended claims.

1. An open-web beam composed of a plurality of lightweight detachable sections, each section including upper and lower tubular rails, a reinforcing brace connecting said rails, one end of one of the rails being open-ended and provided with a bayonet slot, a reduced portion on the other end of said rail, a laterally extending pin on said reduced portion for cooperation with the bayonet slot on the juxtaposed section, and latching means on the ends of the other rail for fixedly securing the sections against relative rotation.

2. An open-web beam composed of a plurality of lightweight sections, each section comprising a first tubular rail and a second tubular rail arranged in parallel relation and spaced apart, a reinforcing brace connecting said rails, the first rail having an open end and an opposite end of reduced diameter corresponding approximately to the inner diameter of the open end, a bayonet joint connection between the open end and reduced end of adjacent sections, and latch means for securing the corresponding ends of the second rail of adjacent sections to prevent relative rotation between said sections, the relative positions of the bayonet joint and latch means being such that the bayonet joint is closed when the second tubular rails are secured by the latch means.

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