

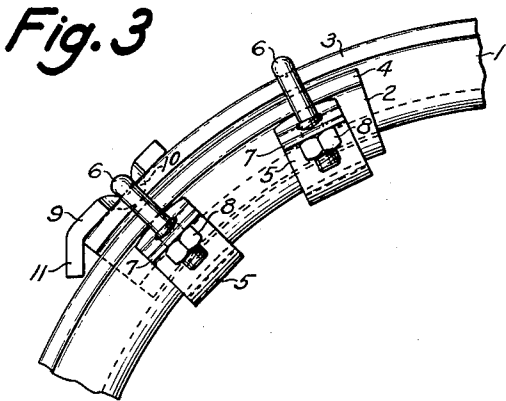
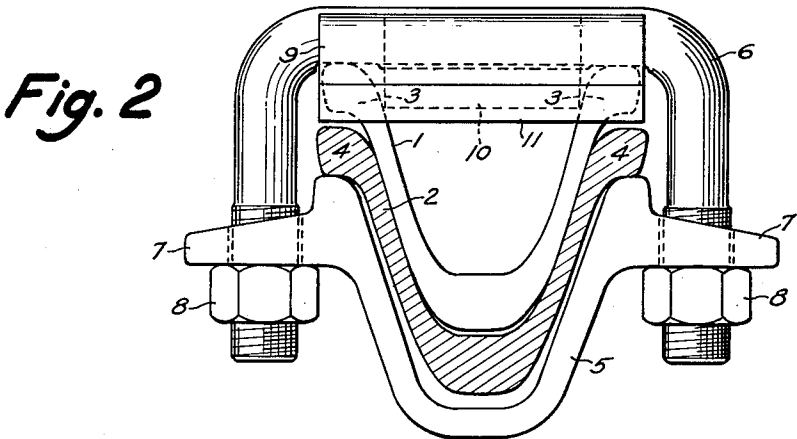
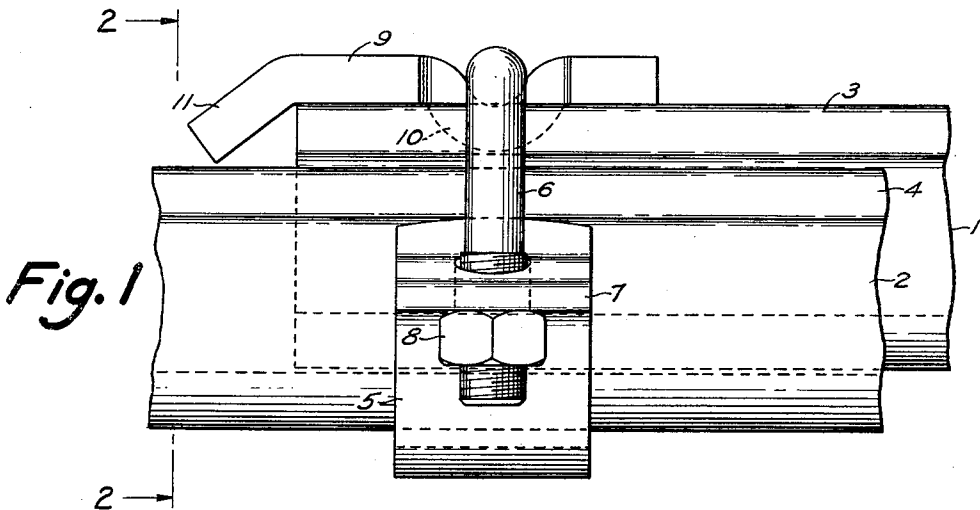
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CLAMPING ASSEMBLY

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CLAMPING ASSEMBLY

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4 Claims. (Cl. 287—103)

This invention relates to yieldable roof supports as used in mines and tunnels. It relates particularly to the clamping arrangement for such supports.

Yieldable roof supports are well known in the art and often consist of several overlapping channel-shaped metal members clamped together so that one member will move relative to the others when under pressure from the surrounding rock and earth. The channel-shaped members are usually curved so as to form a semi-circular or bell-shaped tunnel profile.

Prior clamping arrangements have had several disadvantages. One disadvantage was that when one of the channel-shaped members moved under pressure the clamping assembly tended to move away from the end of such member. This would leave the end unclamped and thus free to dig into the surrounding lagging and overburden. Further yielding would then become impossible and additional pressure from the overburden would either shear the clamping assembly or buckle the channel-shaped members.

Another disadvantage was that the previous clamping arrangements had the fastening bolt exposed and therefore also subject to catching on the lagging or overburden with similar undesirable results. Previous attempts to remedy this problem have involved cutting out or otherwise weakening the channel-shaped members.

Another disadvantage was that previous clamping arrangements required numerous and expensive parts, making the manufacture and installation thereof expensive.

It is therefore an object of my invention to provide a clamping arrangement that will remain a fixed distance from the end of one of the channel-shaped members.

It is a further object of my invention to provide a clamping arrangement that will protect the fastening bolt without weakening the channel-shaped members.

It is a still further object of my invention to provide a clamping assembly that is economical to manufacture and easy to assemble even under difficult underground conditions.

The foregoing objects and the means whereby they are attained will be more fully understood from the following description and claims together with the drawings in which:

FIGURE 1 is a side elevation showing the overlapping portion of the flanged, channel-shaped support members secured by the clamping assembly.

FIGURE 2 is a cross section taken on line 2—2 of FIGURE 1.

FIGURE 3 shows a typical joint where the channel-shaped support members overlap.

FIGURE 1 shows at 1 the outer channel-shaped support member and 2 is the inner channel-shaped support member. The end portions of members 1 and 2 overlap each other and member 1 nests in the channel portion of member 2.

Both members would normally be substantially identical in cross-sectional shape. A preferred cross-sectional shape is of such proportions that a space remains between the flanges 3 and 4 of the channel-shaped members when they are assembled. This can be seen in FIGURE 2. However, the clamping assembly could be easily used with members having another cross-sectional shape.

The overlapping end portions are connected by a flanged channel-shaped strap member 5 bearing only on the inner

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face of flanges 4 of member 2. A U-bolt 6 passes over the members to be clamped and bears only on the outer faces of flanges 3 of member 1. The threaded portions of the U-bolt 6 go through holes in the flanges 7 of strap member 5 and are fastened thereto by nuts 8.

It can be seen by FIGURE 3 that a typical joint where the channel-shaped members 1 and 2 overlap each other is secured by two such clamping assemblies. A drag plate 9 is added to the assembly nearest the end of channel 1. The drag plate 9 lies underneath the U-bolt 6 and has a depressed center portion 10 that is cut out or notched so that this portion 10 is under but not clamped by the U-bolt 6. The drag plate lies on the outer face of flange 3 of member 1. Portion 11 of the drag plate is inclined so as to fit over the end of member 1.

This inclined portion serves a dual function. Not only does it protect the end of member 1 from catching in the lagging or overburden but it also serves to keep the clamping assembly in a fixed relation to the end of member 1.

The depressed center portion 10 accommodates the horizontal arm of the U-bolt, thus preventing the U-bolt from catching in the lagging since the top surface of the U-bolt is almost flush with the top surface of the drag plate. Such an arrangement avoids having to cut notches in or otherwise weaken the channel-shaped member at a point where the stress is likely to be quite great. Smoother yielding occurs by using the drag plate to hold the U-bolt in fixed relation to the end of member 1 instead of using locking devices as some of the prior art has done.

The relatively small number of parts permits easier installation under conditions that are often far from ideal. Likewise all the parts are either stock items or simple to manufacture.

As many possible embodiments may be made of the invention without departing from the scope thereof, it is to be understood that all matter set forth or shown in the accompanying drawing is to be interpreted as illustrative and not in a limiting sense.

I claim:

1. A clamping arrangement comprising, in combination, a pair of elongated, flanged, channel-shaped members in overlapping relationship, a clamp for said members comprising a flanged channel-shaped strap member engaging solely the inner flange faces of one of said channel-shaped members and a U-bolt engaging solely the outer flange faces of the other channel-shaped member and passing through holes in the flanges of the channel-shaped strap member and secured thereto, and a drag plate comprising a center portion depressed to lie between the sidewalls of said other channel-shaped member and underlying the U-bolt, portions immediately adjacent thereto and on either side thereof engaging the outer flange faces of said other channel-shaped member and an inclined portion overlying the end of said other channel-shaped member.

2. A clamping arrangement comprising, in combination, a pair of elongated, flanged, channel-shaped members in overlapping relationship, the proportions of said members being such that the flanges of one member are spaced from those of the other member, a clamp for said members comprising a flanged, channel-shaped strap member engaging solely the inner flange faces of one of said channel-shaped members and a U-bolt engaging solely the outer flange faces of the other channel-shaped member and passing through holes in the flanges of the channel-shaped strap member and secured thereto with nuts, and a drag plate comprising a center portion depressed to lie between the sidewalls of said other channel-shaped member and underlying the U-bolt, portions immediately

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adjacent thereto and on either side thereof engaging the outer flange faces of said other channel shaped member and an inclined portion overlying the end of said other channel-shaped member.

3. A clamping arrangement comprising, in combination, a pair of elongated, channel-shaped members in overlapping relationship, a clamp for said members comprising a channel-shaped strap member engaging one of said channel-shaped members and a U-bolt engaging the other channel-shaped member and passing through holes in said channel-shaped strap member and secured thereto, and a drag plate comprising a center portion depressed to lie between the sidewalls of said other channel-shaped member and underlying the U-bolt, portions immediately adjacent thereto and on either side thereof engaging the top of said other channel-shaped member and an inclined portion overlying the end of said other channel-shaped member.

4. A clamping arrangement comprising, in combination, a pair of elongated, flanged, channel-shaped members in overlapping relationship, a clamp for said members comprising a channel-shaped flanged strap member en-

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gaging one of said channel-shaped members and a U-bolt engaging the flanges of the other channel-shaped member and passing through holes in the flanges of the channel-shaped strap member and secured thereto, and a drag plate comprising a center portion depressed to lie between the sidewalls of said other channel-shaped member and underlying the U-bolt, portions on either side thereof engaging the outer flange faces of said other channel-shaped member and an inclined portion overlying the end of said other channel-shaped member.

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