Dec. 26, 1967 G. BARTHULE 3,360,293

METAL WEB SLING

Filed March 16, 1966 2 Sheets-Sheet 1

Fig. 1

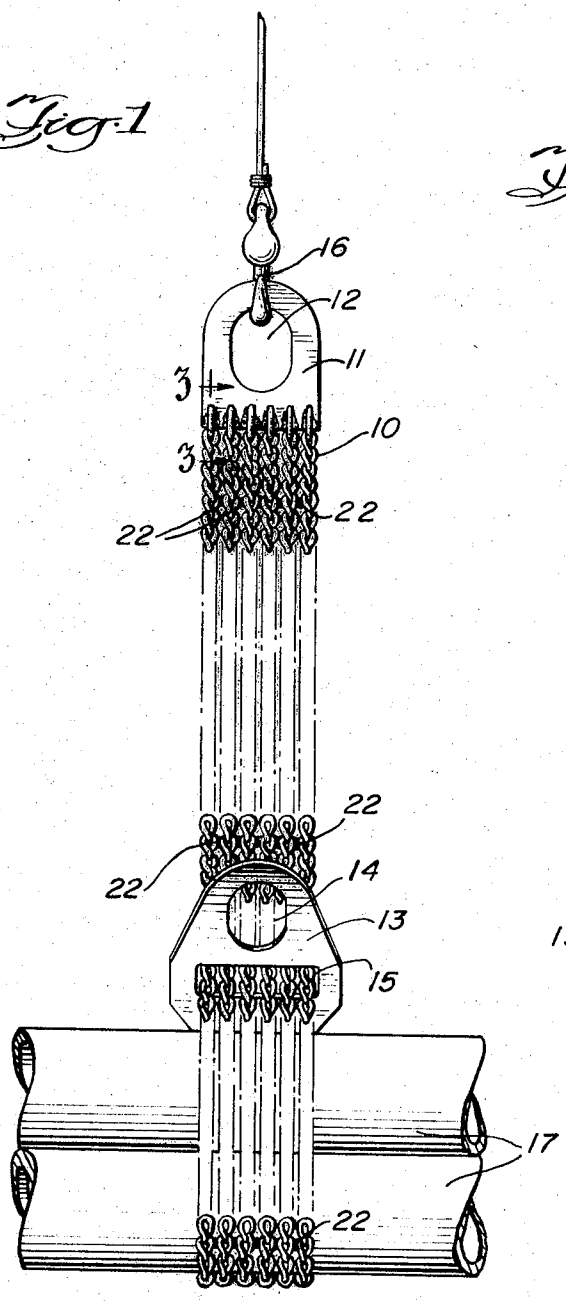
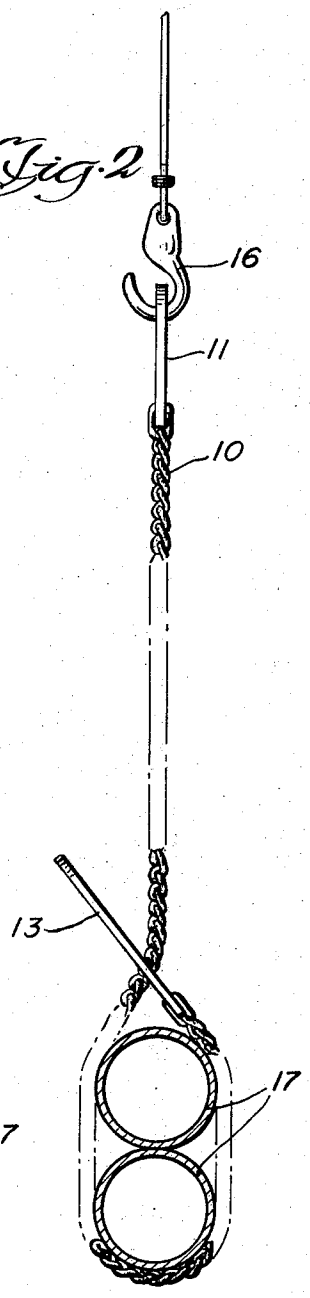


Fig. 2



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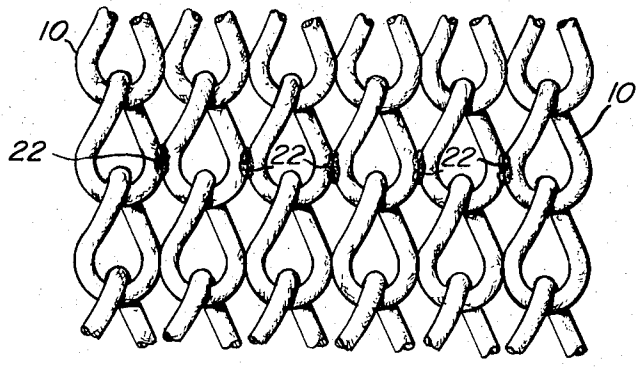


Fig. 4

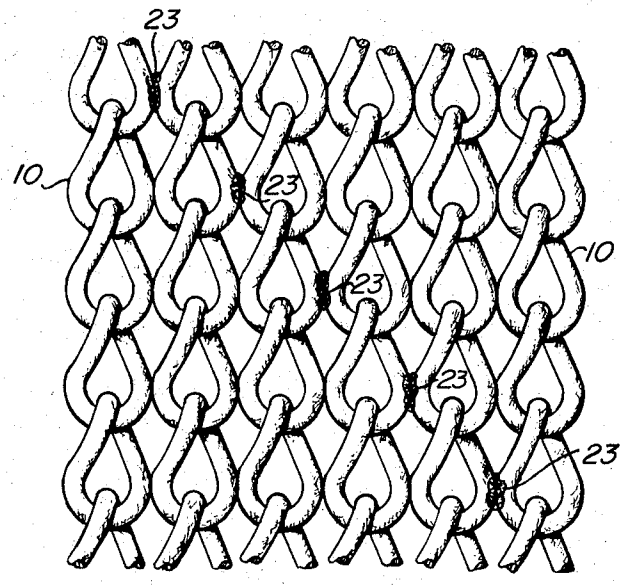


Fig. 5

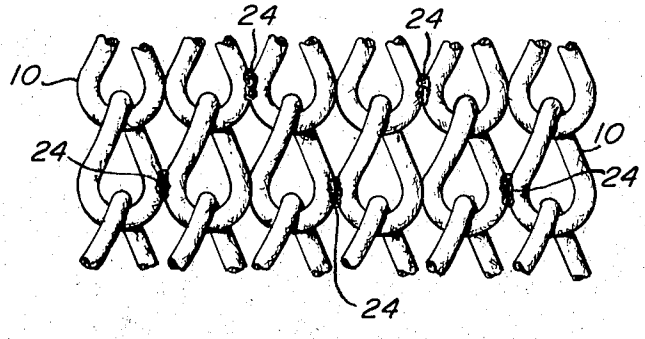


Fig. 6

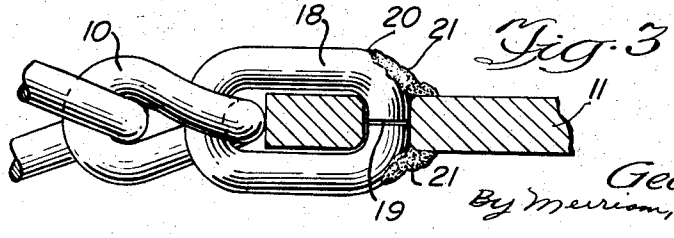


Fig. 3

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METAL WEB SLING

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Filed Mar. 16, 1966, Ser. No. 534,784
7 Claims. (Cl. 294—74)

ABSTRACT OF THE DISCLOSURE

Disclosed is an improved sling for lifting loads. The sling comprises a plurality of metal chain lengths placed in side-by-side parallel and planar arrangement having a metal terminal at each end, and a plurality of connecting means such as welds, clips or links joining adjacent chain lengths together.

This invention relates to apparatus and equipment for lifting loads. More particularly, this invention is concerned with an improved sling for lifting loads.

Slings have been used for a long time to lift loads. Slings, generally, have an elongated, flexible body portion which terminates at each end in an eye or other means by which the sling can be readily grabbed, such as by a lifting hook. United States Patents 1,931,808 and 2,903,-291 show two types of slings which are suitable for many purposes. The particular type and composition of sling which is used will often depend on the goods to be lifted and moved. Often, it is desirable to use a fabric sling in order to avoid scratching or marring the goods being handled. In many instances, however, it is unnecessary to take undue care in lifting various materials, either because they are hard or not easily scratched or marred, or because some slight marring or scratching is insignificant to the overall object in moving the goods. For such purposes, a metal sling can be used. However, it should be relatively inexpensive, rugged, strong and maintain its strength free of undue care. It is an object of this invention to provide such a sling.

There is provided by the subject invention, a sling comprising a plurality of metal chain lengths placed in side-by-side parallel and planar arrangement having a metal terminal at each end to which the ends of the chain lengths are connected, and a plurality of connecting means joining adjacent chain lengths together.

The invention will be discussed further in conjunction with the attached drawings, in which:

FIGURE 1 is a front elevational view of a sling according to the subject invention illustrating its use in a choker hitch and positioned on a hoisting hook;

FIGURE 2 is a side elevational view of the sling shown in FIGURE 1;

FIGURE 3 is a sectional view along the line 3—3 of FIG. 1 and shows one way of connecting the chain ends to an end terminal;

FIGURE 4 is a plan view of a sling body showing one arrangement of welds to connect adjacent chains to one another;

FIGURE 5 is a plan view of a sling body showing another arrangement of joining adjacent chains together by welds; and

FIGURE 6 is a plan view of a sling body showing still another way to join the chain lengths together by welds.

With reference to FIGS. 1 and 2, a plurality of chain lengths **10** are placed in side-by-side parallel arrangement to each other. The chains are advisably of the same length and the links are advisably of the same size and shape. The chain lengths are connected at one end to end terminal **11** having hole or eye **12**, and at the other end to terminal **13** having hole or eye **14** and slot **15**. The slot is used to form a choker hitch on a load by threading terminal **11** through slot **15**. In addition to being used as a choker hitch, the sling can be employed in the form of a simple basket hitch by placing hook **16** through both of holes **12** and **14** instead of through only hole **12** as shown in the choker hitch of FIGS. 1 and 2. Pipes **17** are shown being lifted by means of the choker hitch.

Although the ends of the chain lengths can be joined to the terminals, such as the eye terminals of FIGS. 1 and 2, by a variety of methods, it is considered advisable to weld the end links of the chain lengths directly to the terminals. The end links can be identical to the other links of the chain lengths or special links can be used at the end to facilitate joining the chains to the terminals. Thus, as shown in FIG. 3, link **18** at the end of chain length **10** has been opened by means of cut **19**, and then the ends of the open link squeezed into hole **20** drilled through terminal plate **11** near its edge. To further hold link **18** in place, welds **21** join the link to terminal plate **11**. The use of the described arrangement is not essential, however, since it is considered adequate to simply weld the end link of the chain links directly to the terminal plates.

FIGS. 4 to 6 illustrate various means of joining the chain lengths together to form specific embodiments of slings within the scope of this invention. With reference to FIG. 4, the chain lengths **10** are positioned to have adjacent links of each chain length positioned in rows which run laterally to the chain lengths. Each row of links thus is parallel to the next row of links. In FIG. 4, the adjoining links are fastened together by means of welds **22**. Each weld connects two adjoining links in the same row. The result is that an entire row of adjacent links is welded together in a straight line lateral to the chain lengths. A similar group of welds is applied at spaced apart locations throughout the sling length. Usually, the row of welds stretching across the sling laterally are positioned about every five to ten links from each other along the chain lengths. FIG. 1 shows a group of such parallel welds running laterally across the sling joining the chain lengths together at such points.

FIG. 5 shows an alternative arrangement of joining adjacent links of the chain lengths by welds. In this embodiment, welds **23** are more or less in a line at a 45° angle across the sling body. Thus, the welds **23** connect adjoining links in a more or less step-wise pattern across the width of the sling. Each weld **23** is one link up and one link over from the other.

In FIG. 6, welds **24**, which join adjacent links are located in a staggered arrangement in which every other weld is in one and then the other of two parallel adjacent rows of links.

Instead of joining the chain lengths together by welding adjoining links, it is feasible to connect the chain links together at periodic locations by means of lateral metal links, although this approach is not considered nearly as satisfactory as the direct joining of adjoining links by welds. The embodiment considered most suitable in using this invention is shown in FIG. 4, with the parallel rows of welds being located about five to eight links apart.

By joining the adjacent chain lengths together, and particularly by welds, a sling is formed having a body area between the end terminals which is very much like a webbed material. The chains move and respond essentially like a unitary web, yet flexibility and substantial twisting is possible in employing the sling. By locating the welds at points of contact of adjoining links, the overall surface of the sling body is maintained relatively smooth, and such that it readily slides over surfaces. When not in use, the sling can be laid flat or hung vertically on a hook out of the way and in being so stored, takes up only a minimal amount of space.

The number of chain lengths placed in a side-by-side arrangement in making the sling can be varied according to the purpose for which the sling will be used. Most generally at least three or more chain lengths will be used in side-by-side arrangement, and for many purposes it is advisable to employ at least five to six chain lengths. However, many more chains can be used according to the need for load capacity and frictional gripping about goods being lifted. The chain lengths do not become twisted or entangled with each other because of the periodic welds which maintain the chain lengths in their initial position with respect to each other. The sling body has handling characteristics in many ways similar to a heavy leather belt although with greater flexibility.

The type of chain used in forming the sling is not narrowly critical although the most satisfactory results are obtained by using a conventional twist-link chain as shown in the drawings. Such a chain, when used in the sling, forms a web-like structure with an overall surface that slides over work areas with a minimum of marring or scratching.

Any size chains can be used, and the chains can have any suitable size links. Chains of different sizes would be used to obtain the desired load-lifting capacity in correlation with web width for gripping and bearing requirements. Chains of aluminum or steel are considered most suitable because of their low cost, although chains of other materials could be used.

Various changes and modifications of the invention can be made and, to the extent that such variations incorporate the spirit of this invention, they are intended to be included within the scope of the appended claims.

What is claimed is:

1. A sling comprising a plurality of metal chains of equal length placed in side-by-side parallel arrangement,

a metal terminal at each end of the sling, the ends of said chain lengths being connected thereto, and

a plurality of welds connecting adjoining links of adjacent chain lengths intermittently along their length.

2. A sling according to claim **1** in which the chain links are of equal size and the links of adjacent chain lengths are in parallel rows lateral to the chain lengths.

3. A sling according to claim **2** in which the welds connect adjoining links in intermittent parallel rows lateral to the chain lengths.

4. A sling according to claim **3** in which twist-link chains are used.

5. A sling according to claim **1** in which the ends of the chain lengths are welded to metal eye plate terminals.

6. A sling according to claim **1** in which end links on the chain lengths fit into holes in metal eye plate terminals.

7. A sling according to claim **6** in which the end links are also welded to the terminals.

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