Jan. 12, 1954 J. B. McDONALD 2,665,867

LINE BINDER

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Fig. 1

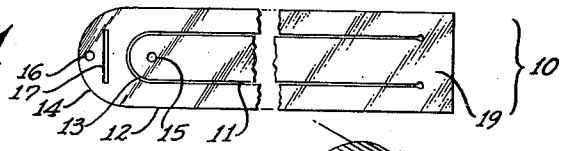


Fig. 2

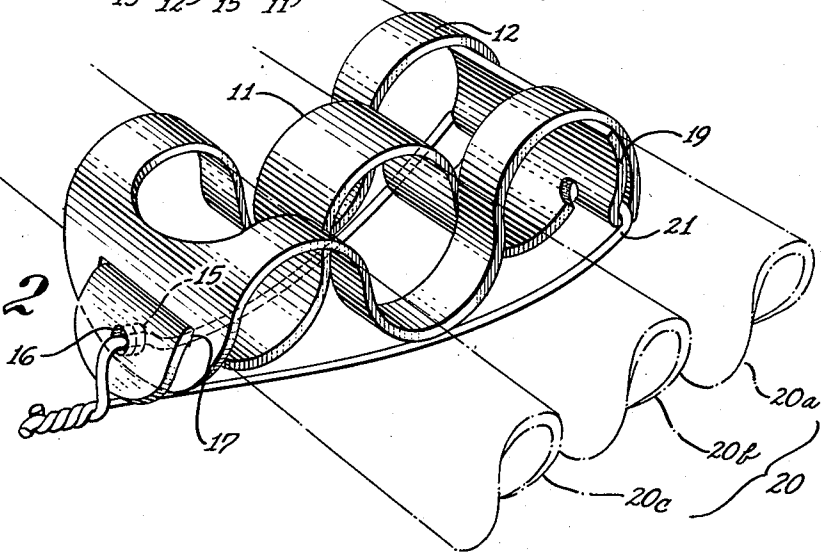
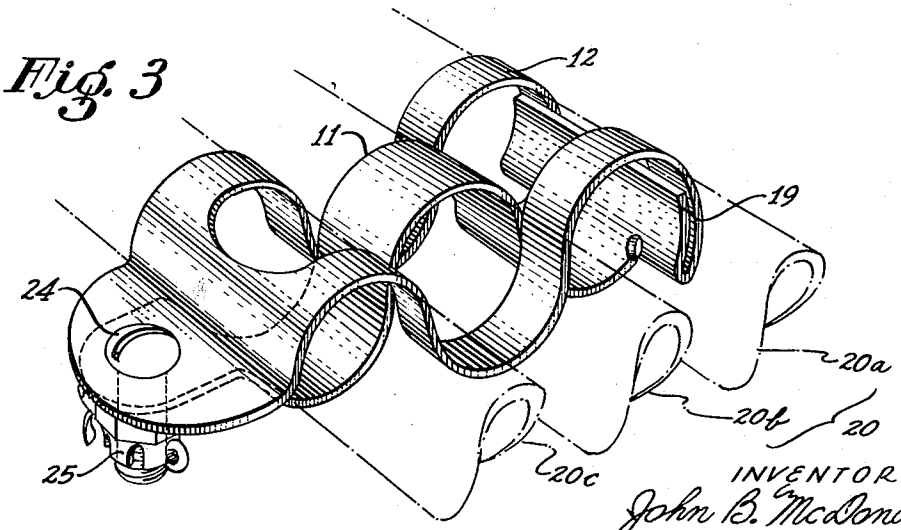


Fig. 3



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LINE BINDER

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1 Claim. (Cl. 248—68)

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The present invention relates to plumbing lines and the like, and more particularly to a means for binding together and securing a number of parallel plumbing lines, conduit or the like.

Wherever a number of plumbing lines or the like run closely parallel between equipment installations, as in aircraft hydraulic systems for example, it is usually necessary to bind and secure closely adjacent lines together at certain points between structural supports in order to eliminate vibration, reduce frictional wear, and occasionally to provide additional support.

One of the objects of the present invention is to provide an economical line binder of lightweight that will meet Army and Navy (AN) standards and which will also be useful in other applications. Cord, tape and rawhide bindings, for example, are not fireproof and are not approved.

Briefly, one form the present invention may take is that of a longitudinal strip of lightweight bendable metal of predetermined length and shape. The central portion of the longitudinal strip is cut away forming an inner longitudinal tongue element having one end free and being joined to the outer strip at the other end only. Thus divided, the outer and inner elements are wrapped and woven alternately progressively around a number of cylindrical members parallel to each other and fastened by a lockwire or other means. The number of members to be bound, and the diameters thereof, determines the length of the longitudinal binder elements.

The present invention will be more clearly understood by referring to the accompanying drawings where:

Figure 1 is a flat plan view of one preferred form of the present invention.

Figure 2 is a perspective view of the binder shown in Figure 1 applied to a number of cylindrical members using a safety wire fastener.

Figure 3 is a perspective view of the binder shown in Figure 1 applied to a number of cylindrical members using a locknut and bolt to fasten the binder in place.

In Figure 1, a longitudinal strap 10 of nonresilient metal, such as .016 annealed stainless steel for example, is symmetrically contoured and cut away in the center to form an inner longitudinal element 11, surrounded by an outer longitudinal element 12, having only one end free. By calculating the diameters of the members to be bound and secured, the length of the binder can be accurately predetermined to exactly fit any specific number of cylindrical members of

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specific diameters. The tab ends 13 and 14 of the inner and outer longitudinal elements 11 and 12, respectively, are preferably rounded as shown, and each are respectively provided with a hole 15 and 16 positioned to align and accommodate a fastener (not shown in Figure 1). The outer longitudinal element 12 is also provided with a transverse slot 17 slightly wider than the inner longitudinal element 11, and is positioned inwardly of the hole 16 in the tab end 14 of the outer element 12. The end opposite the tab ends of the longitudinal elements will be known as the basal end 19 of the strap 10.

In use, the basal end 19 of the strap 10 is curved around the periphery of the outermost member 20*a* of a group of tubular members 20, as shown in Figure 2 for example, with the longitudinal elements pointed downwardly. The outer element 12 is brought outwardly and upwardly behind the basal end 19 which is in contact with the outermost tubular member 20*a*, bending the outer element tangent to the inner element 11. A safety wire 21 can be passed through the radius formed at the bend, to be fastened at the completion of the wrapping operation. The outer element 12 is then wrapped around the top periphery of the outermost tubular member 20*a* and passed downwardly between the outermost member 20*a* and the next parallel member 20*b* and wrapped around the bottom periphery thereof, and is then brought upwardly between the second member 20*b* and the third parallel member 20*c*, repeating the progressive alternate wrapping operation for as many members as are to be bound and secured. The inner element, wrapped reversely of the outer element, is brought under the first member 20*a* and wrapped around the bottom periphery thereof, progressively alternately wrapping each parallel member 20*b* and 20*c* in turn until the tab ends 13 and 14 of each longitudinal element 11 and 12 meet on the opposite side of the group of wrapped members 20. The tab end 13 of the inner element 11 is then passed through the transverse slot 17 and bent downwardly at a substantially right angle thereto, bringing the holes 15 and 16 into alignment to receive the fastening wire 21. Thus it can be seen that the device of the present invention, in addition to providing a strong lightweight line binder which is fireproof, effectively pads one line from its neighboring line so that friction therebetween is prevented.

Where it is desirable to designate line binders for re-use, the tab ends 13 and 14 of the longitudinal elements 11 and 12 can be preformed to

right angles, omitting the slot 17, as shown in Figure 3. The right angled tab ends 13 and 14, of the inner and outer elements 11 and 12 respectively, are diametrically opposed and brought into close contact aligning the holes 15 and 16, and a bolt 24 passed therethrough to receive a locknut 25.

From the above description it will be apparent that there is thus provided a device of the character described possessing the particular features of advantage before enumerated as desirable, but which obviously is susceptible of modification in its form, proportions, detail construction and arrangement of parts without departing from the principle involved or sacrificing any of its advantages.

While in order to comply with the statute, the invention has been described in language more or less specific as to structural features, it is to be understood that the invention is not limited to the specific features shown, but that the means and construction herein disclosed comprise a preferred form of putting the invention into effect, and the invention is, therefore, claimed in any of its forms or modifications within the legitimate and valid scope of the appended claim.

What is claimed is:

A device for binding together a plurality of parallel longitudinal members; comprising a unitary length of flexible metal strip having a lengthwise longitudinal strip cut away from the center thereof to define an intermediate wrapping element joined at one end only thereof to the remaining portion of said strip which forms an outer wrapping element extending completely around the edge of said intermediate wrapping element, a narrow slot transversely positioned in the end of said outer wrapping element adjacent the free end of said intermediate wrapping element, said slot being slightly longer than the width of said intermediate element, a first hole positioned outwardly of said slot, a second hole positioned in the free end of said intermediate strip and on center with said first hole, whereby when said intermediate and outer wrapping elements are alternately wrapped and woven around a plurality of parallel members and brought together at the end of said wrap, the end of said intermediate wrapping element can be passed through said transverse slot in said outer wrapping element and said holes aligned to receive a locking means.

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