My invention relates to means for packaging and shipping heavy coils of sheet metal. The method and package were devised particularly for use with coils of silicon steel in strip form; but it will be evident to the skilled worker in the art that they are applicable to other coils presenting similar problems.

It is an object of my invention to provide an adequate, secure, packaged coil for handling, storage and shipment.

It is another object of my invention to provide an inexpensive package structure, yet a structure which gives adequate protection from the weather as well as from mechanical hazards normally encountered in shipment.

Still another object of my invention is the provision of a packaged coil which can be handled as a unit either by truck means or by means of an electro-magnet attached to a crane or the like.

Still another object of my invention is to simplify the formation of packaged coils in ways which will hereinafter be set forth.

Still another object of my invention is the provision of a packaged coil suitable for railroad shipment in a gondola or box car without bracing or the like.

Further objects of my invention will be pointed out hereinafter or will be apparent to one skilled in the art upon reading these specifications; and these objects I accomplish by that certain construction and arrangement of parts, and in that certain method of which I shall now set forth an exemplary embodiment.

Reference is made to the drawings, wherein: Figure 1 is a plan view of a base structure used for the package.

Fig. 2 is a plan view of a base structure and associated parts ready to receive the coil.

Fig. 3 is a side elevation of a core structure.

Fig. 4 is an end elevation of a core structure.

Fig. 5 is a perspective view showing the package partially formed.

Fig. 6 is a perspective view showing the package with an outer wrapping.

Fig. 7 is a perspective view showing a completed package.

Fig. 8 is a vertical sectional view taken through the coil package.

Fig. 9 is a view of another type of top member which I may employ.

Fig. 10 is a perspective view of the coil and its core before packaging.

The coils of metal are delivered from the mill or from the welding plant in the ordinary form.

They have been coiled up on an expansible mandrel, and after coiling, have been tied with wire or a metal strap (1 in Fig. 10), as is the usual practice. After this, the expansible mandrel has been contracted and the coil removed for packaging.

In making my package, my first step is to provide a pair of skids 2 and 3 in Fig. 3, preferably formed of wood and preferably beveled at their ends as shown. These skids are fastened in an interspaced position by a crossing pair of sheet metal members 4 and 5. Beneath these sheet metal members I prefer to place bands 6 and 7 subsequently to be used in the formation of the coil package.

The structure shown in Fig. 1 is preferably formed by securely nailing the members 4 and 5 to the skids 2 and 3. The ends of the members 4 and 5 may terminate at the edge line of the coil which is to be placed on the skid structure, or they may be so formed as to project beyond the side edges of the coil. Where this is done, in the subsequent packaging of the coil, the ends of the members 4 and 5 may be bent upwardly and will serve in part to give edge protection to the coil.

As shown in Fig. 2, the next step is to place over the structure of Fig. 1, a sheet 8 of protective material. This sheet may be of any flexible substance desired. I have found it entirely satisfactory to use a water-proof fabric formed of two layers of heavy paper cemented together by means of asphalt and having between them long, strengthening fibers usually of jute or sisal; but other materials will serve as wrappings such as multiple layers of paper cemented together with a water-proof adhesive, treated cloth or other rubberized fabrics, paper reinforced with cloth, etc.

It facilitates the formation of my package, as will hereinafter be made clearer, if the sheet is of such size as to cover the cylindrical part of the coil and overlap the coil on its top edge. Over the sheet 8 and over the structure of Fig. 1, I prefer to place a resilient and fairly stiff disk 9. This disk may be made of various substances including metal; but I have found it entirely satisfactory to use a disk of ordinary corrugated board such as that used in the manufacture of shipping cases. A double lined corrugated sheet cut of circular form, or multiples of this structure, serve very well. The structure of Fig. 2 is now ready to receive the coil.

I find it preferable to place in the coil a core structure. Such a structure is illustrated in Figs. 3 and 4, and may comprise interspaced wooden
disks 10 and 11 fastened together by a multiplicity of wooden strips 12, of lath-like form. In an exemplar coil of sheet metal, of thirty-eight inches in diameter, the disks 10 and 11 may be say 15 inches in diameter and formed of three-fourths inch stock. One or more of these disks may be used at each position in the structure of Figs. 3 and 4. The strips 12 may be say three-eighths inch in thickness by one and five-eighths inch wide, and of a length appropriate to the length of the coil. The member 3 and 9 of Fig. 1 may for usual sizes of coils, be cut from 2 x 4 lumber.

The coil 13 containing the core structure, is next placed upon the disk 8 in a position which will be clear from Fig. 8. When this has been done, the sheet 8 is folded up around the coil so that the package assumes the appearance shown in Fig. 5. It will now be clear why it is advantageous to have the sheet 8 big enough to cover the outer sides of the coil and extend over the top thereof, since the structure of Fig. 5 is substantially self-sustaining, and no fastenings for the sheet 8 are required during the application of the outer wrapping.

As shown in Fig. 6, an outer wrapping, longer in length than the coil, is next wound around the coil. This outer wrapping is indicated at 14 and is preferably held in place by a band or tie 15. The end of the sheet 14 which projects above the coil is next neatly folded down on top of the coil as shown.

Finally disk 16, similar to the disk 9 may be placed on top of the coil as shown in Fig. 7.

Edge protecting means 17 may be put in place as shown. These edge protecting means may be solid fiber or other cardboard substance, or may be of metal. The strap members 6 and 7 are next brought up the sides of the coil and are fastened at the top where they are fastened in ways known to the art. The coil structure is now complete, and ready for shipment.

It will be noted that the coil is completely enclosed in a water-proof wrapping and that the wrapping is so disposed as to make the coil rain-proof. As a consequence a series of these coils may be placed in a gondola car in somewhat interspaced relationship, and transported without difficulty in spite of adverse weather conditions.

Furthermore, a gondola car or in a covered vehicle such as a box car, truck or the like, the use of skids beneath the coils will permit some shifting of their movement upon impact, as is understood in the art of shipping sheet metal, so that bracing is not required.

My package is neat in appearance, and the disk 16 on its top is available for advertising matter, shipping instructions or other indicia. The package is also one which in spite of its wrapping is readily handleable by the electromagnetic means ordinarily employed in handling bare coils of sheet metal. This, it will be realized, is of considerable advantage not only in storage, but also especially in the loading and unloading of vehicles. My package is however, likewise one which can be handled by the usual handling means for bound stacks of sheet metal.

In Fig. 9, I have shown a type of top structure which while not as neat as the disk 16, is sometimes found of advantage particularly where a manufacturer is engaged in packaging and shipping a wide variety of sizes or coils. Under some circumstances to attempt to provide a disk 16 accurately cut for all sizes of coils, would require an uneconomical inventory.

The device of Fig. 9 consists of a semi-circular body 18 of corrugated board or other substance, the outer edge portion of which is provided with tabs or ears 19. A pair of these members in opposed relationship may be substituted for the disk 16, the meeting edges of the members substantially following a diameter of the coil. The tabs 19 may be bent over the top circular edge of the coil, to a greater or less extent, as may be desired. Any pair of these members may be employed with coils of different sizes from each other in size, so that the number of different sizes of top members required is greatly cut down. Where any great length of the tabs 19 is bent over the circular top edge of the package, it will contribute to the neatness of the package to pass a band around it near its top edge, so as to hold down all of the flaps 19. Where a pair of the members of Fig. 9 are to be used with a relatively small coil, these members 19 may be overlapped at the center of the package, as will be clear.

Modifications may be made in my invention without departing from the spirit of it.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is:

A coil package comprising a pair of skids, means for holding said skids in parallel interspaced relationship and crossed bands attached to said skids, a wrapper material surmounting the aforesaid structure, a coil on said wrapping material, said wrapping material being brought up around the sides of said coil and said bands being positioned up the sides of said coil and across the top thereof to hold said coil on said skids.

2. A packaged coil comprising skids, means for holding said skids in parallel interspaced relationship, crossed bands attached to said skids, a sheet of wrapping material surmounting said structure, a coil resting on said wrapping material and on said structure, said wrapping material being brought up around the sides of said coil, additional wrapping material covering the sides of said coil and the top thereof, and said crossed bands extending up the sides of said coil and across the top thereof, whereby to secure said coil to said skids.

3. In a skid structure for a coil package, a pair of interspaced skids, crossed bands surmounting said skids and crossed strips of sheet metal contacting said skids and extending from one to the other, said bands being fastened to said skids and serving thereby to fasten said strips to said skids.

4. In a coil package, a pair of interspaced skids, crossed bands attached to said skids, means for holding said skids in interspaced parallel relationship, a sheet of wrapping material surmounting said structure, a protective disk on said sheet and a coil resting on said sheet being brought up about the sides of said coil, an additional sheet of wrapping material wrapped around said coil and folded over the top thereof, said bands being brought up about the sides of said coil external to said sheets of wrapping material and extending and fastened to the top thereof, whereby to hold said coil to said skids.

5. In a coil package, a pair of interspaced skids, crossed bands attached to said skids, means for holding said skids in interspaced parallel relationship, a sheet of wrapping material surmounting said structure, a protective disk on said sheet and a coil on said disk, said sheet being
brought up about the sides of said coil, an additional sheet of wrapping material wrapped around said coil and folded over the top thereof, said bands being brought up about the sides of said coil external to said sheets of wrapping material and extending and fastened across the top thereof, whereby to hold said coil to said skids, and a protective disk on the top of said coil and interposed between said wrapping material and said bands.

6. In a coil package, a pair of interspaced skids, crossed bands attached to said skids, means for holding said skids in interspaced parallel relationship, a sheet of wrapping material surrounding said coil structure, a protective disk on said sheet and a coil on said disk, said sheet being brought up about the sides of said coil, an additional sheet of wrapping material wrapped around said coil and folded over the top thereof, said bands being brought up about the sides of said coil external to said sheets of wrapping material and extending and fastened across the top thereof, whereby to hold said coil to said skids, and a protective disk on the top of said coil and interposed between said wrapping material and said bands, said disk being formed of two juxtapositioned parts having tabs bent over the side edges of said coil.

7. A process of forming a packaged coil which comprises forming a skid structure by fastening skids together with crossing members and incorporating in said structure crossed bands, positioning a sheet of wrapping material above said structure, setting a coil on said structure, wrapping said wrapping material about said coil and bringing up said bands and fastening them over the top of said coil.

8. A process of making a packaged coil which comprises positioning skid members in parallel interspaced relationship, positioning crossed bands with respect to said skids, positioning crossed sheet metal members with respect to said skids, and fastening them thereto whereby to fasten said skids in interspaced relationship, and to fasten said bands to said skids, positioning a sheet of wrapping material over said structure, positioning a coil thereon, bringing up said wrapping material about the sides of said coil, wrapping said coil with additional wrapping material and folding said last mentioned material over the top thereof, and bringing up said bands and fastening them across the top of said coil.

9. A process as claimed in claim 8 which comprises positioning a protective disk between said first mentioned wrapping material and said coil, and positioning another protective disk on the top of said last mentioned wrapping material and beneath said bands.

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