June 5, 1934.

M. G. WERME ET AL

1,961,317

BALANCED SPIRAL FABRIC

Filed Feb. 6, 1934

Fig. 1

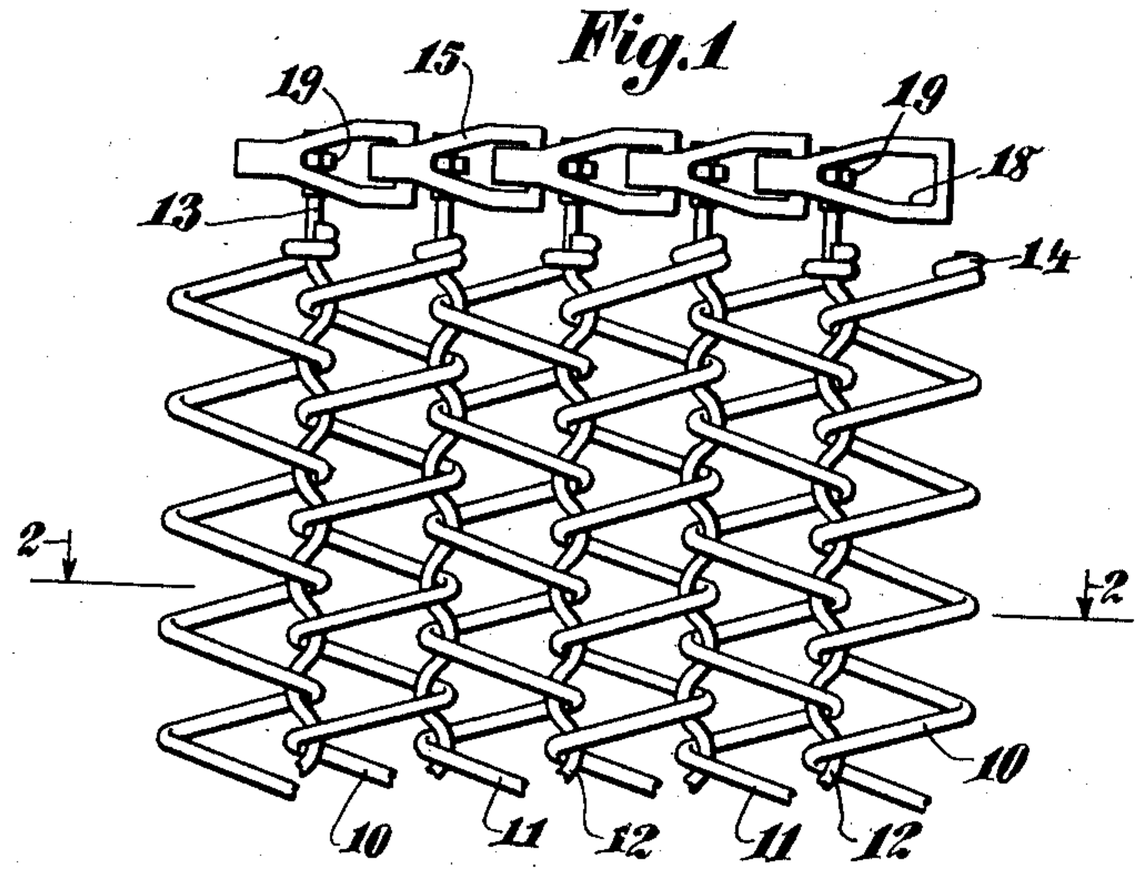


Fig. 2

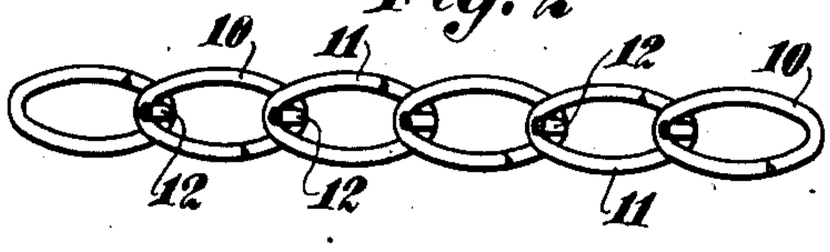


Fig. 3

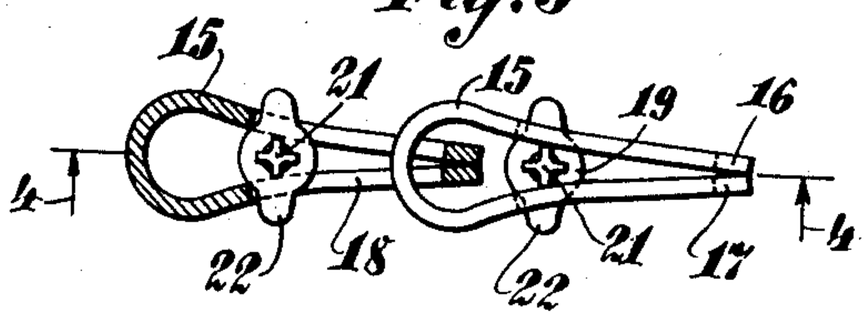
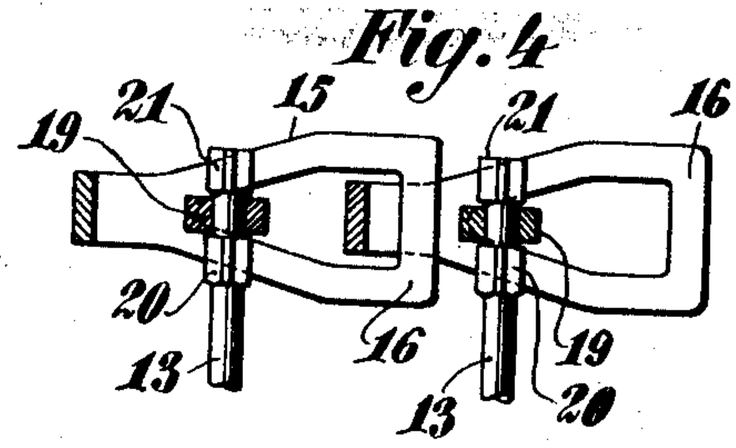


Fig. 4



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BALANCED SPIRAL FABRIC

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Application February 6, 1934, Serial No. 709,928

6 Claims. (Cl. 245—10)

The present invention relates to fabrics and embodies, more specifically, an improved wire fabric designed particularly for use as a conveyor belt or the like. The invention is especially concerned with conveyor belts formed of a plurality of transverse coils of wire which are secured together through the instrumentality of hinge connectors.

Conveyor belts have heretofore been designed and formed of transverse coils of wire, alternate coils being of one direction of spiral upon one side of the belt and intermediate coils extending in the opposite direction upon the same side of the belt in order that transverse creepage of the belt during operation may be prevented. These existing forms of belts are illustrated in the copending application of Vernon C. King, Serial No. 660,121, filed March 9, 1933, for Balanced spiral fabric, and the transverse connectors have been welded to the adjacent coil sections and constitute what is known as a balanced spiral fabric.

In accordance with the present invention, it is proposed to provide a balanced spiral fabric having the advantages of the existing spiral fabrics above alluded to and, in addition, further advantages including the provision of a structure which will not require heat treatment after uniting the connectors and spiral members, as by welding.

A further object of the invention is to provide a fabric of the above character composed of parts which are articulated in such fashion as to provide a loose connection between adjacent elements so that the chain, as it hangs freely and festoons, is entirely flexible thus permitting the fabric or chain to bend in two planes instead of only one plane.

A further object of the invention is to provide a fabric of the above character wherein the elements are assembled in such fashion as to avoid disturbing the physical characteristics thereof, as frequently results when the material is welded.

A further object of the invention is to provide a fabric of the above character wherein the ends of the spiral elements are connected to the connectors in such fashion as to improve the resulting strength and physical characteristics of the metal of all of the elements.

A further object of the invention is to provide a fabric of the above character wherein the elements may be conveniently disconnected in order that repair thereof may be readily accomplished without destroying or damaging the adjacent elements of the fabric.

Further objects, not specifically enumerated above, will be apparent as the invention is described in greater detail in connection with the accompanying drawing, wherein:

Figure 1 is a plan view of a portion of a balanced spiral fabric provided with a chain edge and constructed in accordance with the present invention.

Figure 2 is a view in section, taken on line 2—2 of Figure 1, and looking in the direction of the arrows.

Figure 3 is a view in end elevation, partly broken away and in section showing the construction of the chain edge and the manner of securing the crimped connectors thereto.

Figure 4 is a view in section, taken on line 4—4 of Figure 3, and looking in the direction of the arrows.

With reference to Figure 1, the spiral fabric is shown as being formed of alternate right and left hand spiral elements 10 and 11, respectively. These elements are hingedly connected by means of crimped wire connections 12 which extend transversely of the belt and are formed with straight extensions 13 at the ends thereof. The spiral elements 10 and 11 are hinged within the adjacent crimped portions of the connectors 12 and knuckles 14 are formed upon the ends of these elements through which the straight ends of the connectors 12 extend. These knuckles are formed by one or more turns of the spiral elements and enable free pivotal movement of the spiral elements to take place about the respective crimped wire connectors.

At each side of the fabric, chains 15 are provided, the links of the chain being formed with overlying ends 16 and 17 in which apertures 18 are formed. The straight ends 13 extend between the sides 16 and 17 of the links and are adapted to receive washers 19, these washers being properly positioned by means of inner ears 20 and outer ears 21. The washers 19 are formed with ears 22 to facilitate the securing of the washers within the apertures 18, as clearly shown in Figure 3.

In manufacturing and assembling the elements, the spiral members 10 and 11 are formed with knees 14 as above described and are hingedly connected by inserting the crimped wire connectors therethrough. The crimped wire connectors are previously provided with washers 19, spaced by the four ears 20 and 21 at one end thereof and, at the other ends thereof, the connectors are formed with the inner ears 20. The connectors thus formed are slipped through the properly po-

sitioned right and left hand spirals and the knees formed at the ends thereof, the ends without the washers being the entering ends of the connectors in slipping them into the spirals. Washers 19 are then inserted over the entering ends of the spirals and the outside ears 21 are formed in order that these washers may be properly positioned. The fabric so formed is then ready to have the chains attached thereto, the first step in such operation being the opening of the links of the chain by means of a suitable tool. After the links have been opened, they are slipped over the washers on the straight ends 13 of the connectors in order that the washers may be received within the openings 18. The links of the chain are then closed, positioning the elements as shown in Figures 3 and 4.

It will thus be seen that the spiral fabric may be easily repaired by opening the links of the chain 15 and removing the desired connectors in order that they may be replaced. This operation does not injure adjacent elements of the fabric.

The structure of the present invention is characterized by complete flexibility, causing the fabric to hang in perfect festoons. No opportunity arises for the elements to become entangled and the connection of the various elements of the fabric in the manner shown and described herein prevents injury to the material of the fabric, such as frequently encountered where the elements are welded together.

Moreover, the elements of the fabric accommodate bending or relative movement therebetween in two planes instead of only one plane as characteristic of present spiral fabrics.

A further advantage of the present structure lies in the formation of a continuous chain edge which will not fray, thus imparting uniform and great tensile strength to the belt and avoiding the necessity of heat treating the elements thereof.

A belt constructed in accordance with the present invention may be formed of galvanized wire inasmuch as the structure does not destroy the zinc coating of the wire because no welding or other deleterious operations are performed upon the elements of the fabric. Many other advantages will be apparent and the invention is not to be limited, save as defined in the appended claims.

We claim as our invention:

1. A wire fabric formed of spiral elements, transverse connectors between the elements, chains at the ends of the elements, washers on the ends of the connectors and secured to the chains, and ears pressed out of the connectors to position the washers.

2. A wire fabric formed of spiral elements, transverse connectors between the elements, chains at the ends of the elements, washers on the ends of the connectors and secured in the chains, said washers having ears formed thereon to engage the links of the chains, and means to position the washers on the connectors.

3. A wire fabric formed of spiral elements having knuckles formed at the ends thereof, transverse crimped wire connectors extending through the elements and knuckles, chains at the ends of the elements, washers on the ends of the connectors engaging the links of the chains, and means to position the washers on the connectors.

4. A wire fabric formed of spiral elements having knuckles formed at the ends thereof, transverse crimped wire connectors extending through the elements and knuckles, the connectors having straight ends, chains at the ends of the elements, washers on the straight ends of the connectors, said washers being received in the links of the chains, and means to position the washers on the straight ends of the connectors.

5. A wire fabric formed of spiral elements, transverse connectors with which said spiral elements are pivotally engaged, chains disposed along the edges of the fabric and comprising a plurality of links pivotally engaged, respectively, the transverse pivotal axes of the links, respectively, being offset with respect to said connectors, respectively, and means to secure said connectors pivotally to said links, respectively.

6. A wire fabric formed of spiral elements, transverse crimped connectors with which said spiral elements are pivotally engaged, straight portions formed at the ends of said connectors and extending beyond the edges of said fabric, chains disposed along the edges of the fabric and comprising a plurality of links pivotally engaged, respectively, the transverse pivotal axes of the links, respectively, lying between said straight ends of the connectors, respectively, and means to secure said straight ends of the connectors pivotally to said links, respectively.

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