Sept. 21, 1954 K. E. STIEGELE 2,689,450

EXPANSIBLE BRACELET

Filed March 20, 1952 2 Sheets-Sheet 1

Fig. 1

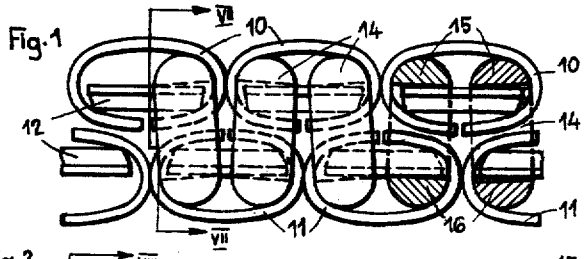


Fig. 2

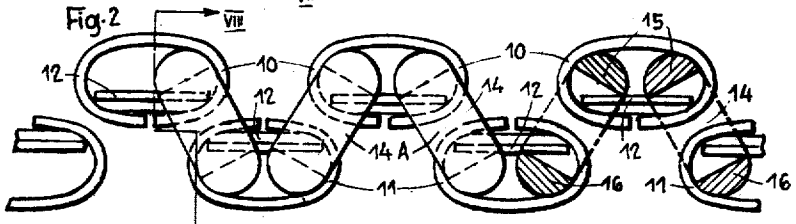


Fig. 3

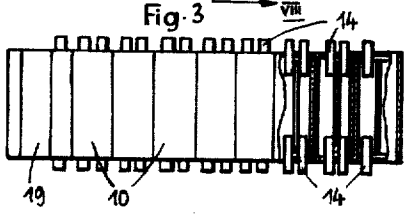


Fig. 4

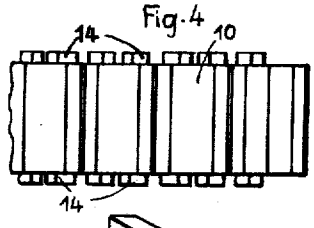


Fig. 5

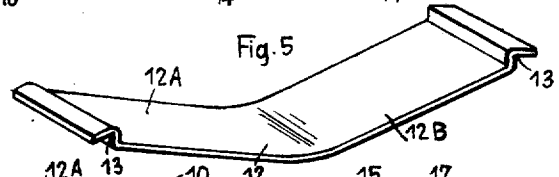


Fig. 7

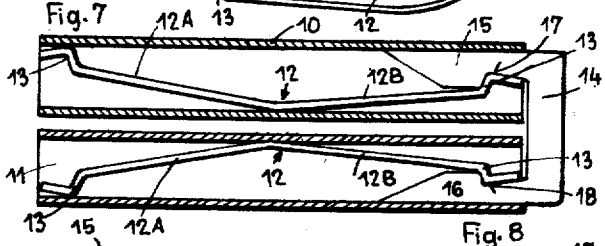


Fig. 6

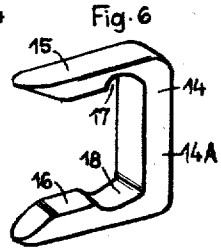
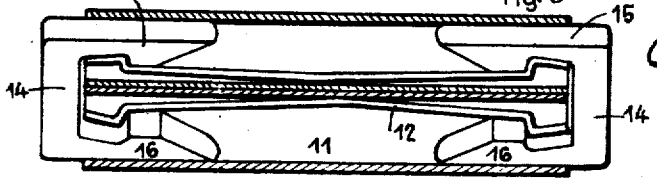


Fig. 8



Inventor
Karl E. Stiegele
By Jerome W. Rafter
Atty.

Sept. 21, 1954 K. E. STIEGELE 2,689,450

EXPANSIBLE BRACELET

Filed March 20, 1952 2 Sheets-Sheet 2

Fig. 9

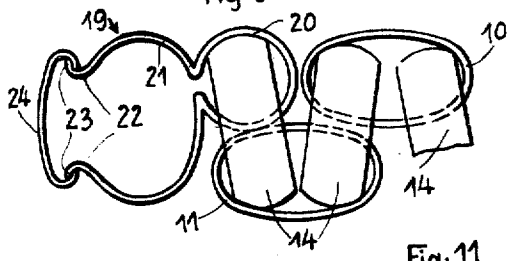


Fig. 12

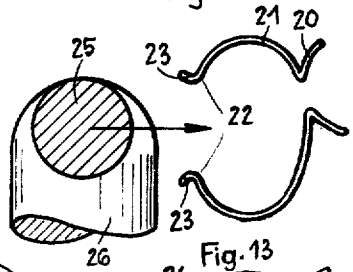


Fig. 10

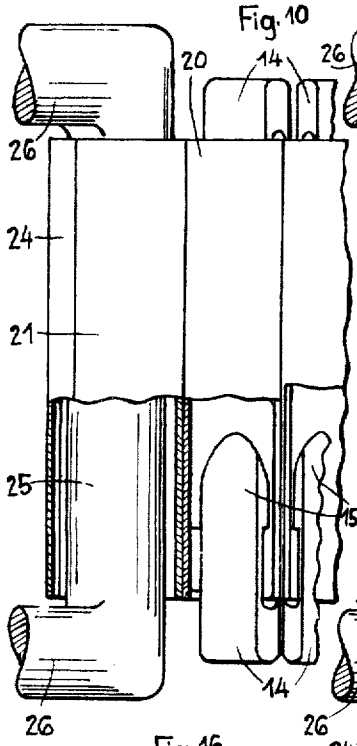


Fig. 11

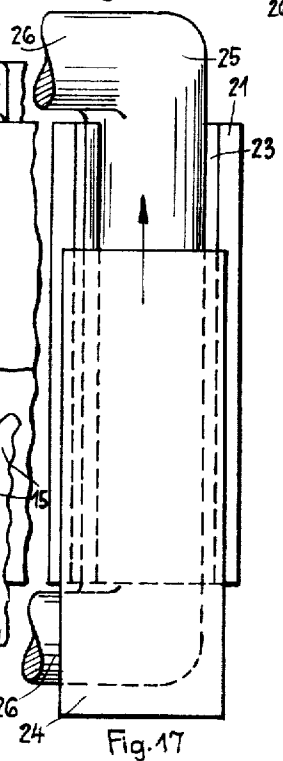


Fig. 13

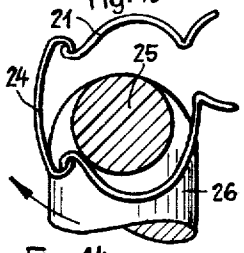


Fig. 14

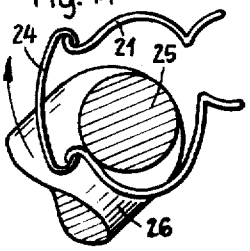


Fig. 15

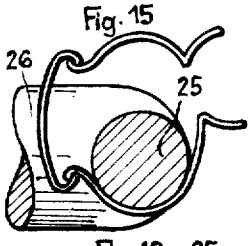


Fig. 16

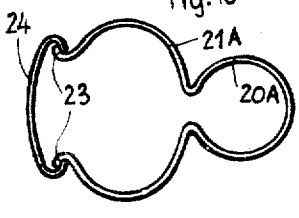


Fig. 17

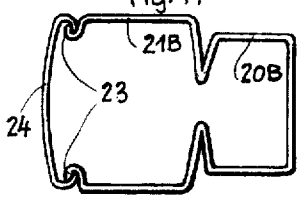
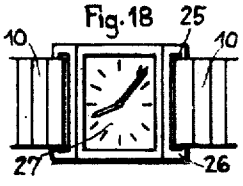


Fig. 18



Inventor
Karl E. Stiegele
By
Pennie & Pennie
Atty.

Patented Sept. 21, 1954 2,689,450

UNITED STATES PATENT OFFICE

2,689,450

EXPANSIBLE BRACELET

Karl Emil Stiegele, Huchenfeld, near Pforzheim, Baden, Germany

Application March 20, 1952, Serial No. 277,561

Claims priority, application Germany April 10, 1951

9 Claims. (Cl. 59—79)

1

The present invention relates to bracelets of the so-called "expansible type," and more particularly has reference to an expansible bracelet defined by a plurality of interconnected links and spring means normally urging the links to a retracted position, yet permitting the links to be moved to an extended position, the invention being particularly efficacious for use as a supporting bracelet for watches and the like.

While expansible bracelets are in the main quite satisfactory, they do possess, however, certain objectionable features. One of the most objectionable characteristics of expansible bracelets is the fact that when the bracelets have been expanded or extended, a gap or hiatus exists between adjacent links or bands which tends to detract from the pleasing appearance of the bracelet. Another objection is that these prior bracelets have been relatively complex in structural detail, requiring numerous essential working parts, with the attendant result that they are expensive to manufacture and, in addition, quite frequently require repair, thus materially increasing the maintenance costs of the bracelet.

Accordingly, an important object of the present invention is to overcome the foregoing and other disadvantageous features by providing an expansible bracelet which includes but three cardinal working parts, namely the individual links, the means interconnecting the individual links, and a resilient element for securing the connecting means to the links and at the same time serving to maintain the links in the retracted position yet allow the links to be moved relatively to each other for enlargement of the bracelet.

Still a further object of the present invention is to provide an expansible bracelet provided with an outer row of links, an inner row of links, means connecting the links of the inner row with those of an outer row so that the links of the respective rows are displaced or staggered with respect to adjacent links of the other row, so that when the bracelet is expanded, the hiatus between adjacent links of one row will be filled by the adjacent links of the other row, thereby giving the visual effect of a continuous band.

And still a further object of the present invention is to provide an expansible bracelet of the character described wherein the means for connecting the links can be readily secured to or detached from the links to enable the links to be replaced in the event a link or links are damaged or removed to decrease the size of the bracelet.

2

Yet another object of the present invention is to provide a novel connecting member by means of which the expansible bracelet can be secured to a watch case or the like.

With the foregoing and other objects in view, the invention consists in the details of construction, and in the arrangement and combination of parts to be hereinafter more fully set forth and claimed.

In describing the invention in detail, reference will be had to the accompanying drawings forming part of this application, wherein like characters denote corresponding parts in the several views, and in which:

Figure 1 is a fragmental side view, partly in section and partly broken away, of an expansible band constructed in accordance with the present invention, the parts thereof being shown in the retracted position.

Figure 2 is a view similar to Figure 1, but showing the parts in the expanded or extended position.

Figure 3 is a top plan view, partly broken away and partly in cross section, of the structure shown in Figure 1, the view being on a somewhat smaller scale.

Figure 4 is a top plan view of the element shown in Figure 3, but being on a somewhat smaller scale.

Figure 5 is a view in perspective of a leaf spring adapted to be disposed within each link for retaining the connector therein.

Figure 6 is a view in perspective of the connector for use with the individual links.

Figure 7 is a sectional view taken along the line VII—VII of Figure 1, the view looking in the direction of the arrows, the connector being omitted at the left hand side of the respective links, the view being on a somewhat enlarged scale.

Figure 8 is a sectional view taken along the line XIII—XIII of Figure 2, the view looking in the direction of the arrows, the view being on a somewhat enlarged scale.

Figure 9 is a side view illustrating the means for connecting one end of the expansible bracelet to an object to be supported thereby.

Figure 10 is a top plan view, partly in section and partly broken away, showing the means whereby the bracelet is attached to the object to be supported thereby.

Figure 11 is a top view of the connecting means.

Figures 12, 13 and 14 illustrate, respectively,

the steps whereby the connecting means is to be attached to the object to be supported thereby.

Figure 15 is a side view depicting the object to be supported by the bracelet in its final position relative to the connecting means.

Figure 16 is a side view of a modified form of connector.

Figure 17 is a side view of yet a further form of connector, and

Figure 18 is a top plan view showing the bracelet attached to a wrist watch, the bracelet being illustrated on a smaller scale.

Referring to the drawings, and more particularly to Figure 1, the bracelet comprises an outer row of hollow links 10, an inner row of similar links 11, a leaf spring 12 located within each of the links 10 and 11, and a connector 14 for interconnecting the links of the respective rows.

Each of the links 10 and 11 is open at each side thereof, and while the drawings illustrate the links as being elliptical, it is, of course, to be understood that they may be of any desired configuration in order to adapt the bracelet to particular tastes desired.

The links 11 of the inner row, that is to say the row which will be in engagement with the wrist of the wearer, are staggered with relation to the links 10 of the outer row with respect to the longitudinal direction of the bracelet. It can be seen from Figure 1 that in the retracted position, the transverse mid point of each of the links 11 will be in alinement with the abutting ends of the links 10 of the outer row. As will later be more fully discussed, this means that when the links are extended, the gap between the ends of the adjacent links 10 will be filled by link 11 which is connected to the adjacent links 10.

The spring 12 is of the leaf type and, as shown in Figures 5 and 6, the spring is bent at approximately its mid point to provide a pair of diverging legs 12A and 12B, the free ends of the legs 12A and 12B terminating in an upwardly bent end portion 13. The spring 12 is of such length that when it is inserted into each of the links 10 and 11, the outer ends thereof will be approximately flush with the open sides of the links and the angle of the legs 12A and 12B is such that the upwardly bent ends will be spaced a very slight distance from the inner wall of the link.

The connector 14 is U-shaped as shown in Figure 4 and includes a web 14A and legs 15 and 16. The outer surface of the web 14 and the legs 15 and 16 is convex, while the inner surfaces of the respective parts is planar, as perhaps more clearly shown in Figures 1 and 2. In these same figures, it will be noted that the legs 15 and 16 are of greater width than thickness, the purpose of which will be more fully described. Each of the legs 15 and 16 in proximity to their point of juncture with the web 14A is provided with a notch or cut-out portion 17 and 18 so that when the connectors are inserted into the open sides of the links 10 and 11, the upwardly bent ends 13 will fit into the notches to thus anchor the connectors to the links.

In assembling the bracelet, the leg 15 is inserted into one of the open sides of one of the links 10, and the leg 16 is inserted into the side of the link 11. A second connector is then inserted into the adjacent side of another link 10, while the leg 16 thereof is inserted into the side of the link 11. In lieu of the foregoing assembly steps, the legs 15 of two connectors can be simultaneously inserted into the open side of a link 10 for engagement by the bent end 13 of the spring,

while the legs 16 of the connectors are fitted into adjacent sides of a pair of links 11 of the inner row. Needless to say, regardless of the technique employed in inserting the connectors into one of the open sides of the links 10 and 11, a similar procedure is used for fitting the connectors into the other open side of the links and after the requisite number of links have been thus connected, it is manifest that the links can be extended against the action of the springs 12, the legs of the individual connectors functioning as pivots, and when extended, the link 11 of the inner row between adjacent links 10 of the outer row will fill the gap between the links 10, thus giving the effect of a continuous band structure.

It will also be observed that the thickness of the legs 15 and 16 is so dimensioned as to correspond to the inside height of the links 10 and 11, which means that when the legs are moved into the links, the springs 12 will receive a slight preliminary tension (see Figure 7). This will cause the connectors to be pressed into the approximately vertical position illustrated in Figure 1 and thus urge the links closely together. However, the individual springs 12 will remain with the legs 12A and 12B extending angularly (Figure 7) whereby the legs 15 and 16 of the links are supported properly within the links yet are capable of pivotal action with respect to the links. When the bracelet is extended, the connectors 14 are pivoted whereby the legs 15 and 16 turn and thus exert a pressure upon the ends of the spring 12, thereby flattening the spring. Hence, when the extending or expanding force is relieved on the bracelet, the springs 12 will again turn the legs 15 and 16 and thus force the links 10 and 11 of the outer and inner rows together to the position shown in Figure 1. With further respect to the leaf springs 12, it should be stressed that the springs function to hold the connectors in the hollow links 10 and 11 and also serve to oppose the rotation of the legs 15 and 16 of the connectors in the links. Consequently, it is important that the legs of the connector have a greater width than thickness so that upon rotation of the legs in the links, the leaf spring 12 is pressed flat. Of course, when the pull is relieved upon the bracelet, the connectors are returned to the initial position to contract the bracelet as mentioned above. Of course, during these movements, the grip of the upwardly bent ends 13 of the leaf spring is maintained in the notches 17 and 18 provided in the legs 15 and 16 of the connector.

Thus it will be seen that a relatively small flattening of the leaf springs effects a strong oscillating movement of the connectors so that with a small wear of the springs, a large extension of the bracelet is achieved.

It will be appreciated, therefore, that the present expansible bracelet is relatively simple, both as to structural detail and operation, and can be readily assembled or disassembled by inexperienced personnel. The band per se merely includes three individual parts, namely the links, the leaf springs, and the connectors, and by virtue of the structural details of the connectors and the springs, the bracelet can be assembled without any permanent connections, thereby overcoming an objectionable characteristic of the prior art wherein the salient features of the bracelet were secured together by means of soldering, riveting and the like. Furthermore, the use of the leaf spring insures that there is little, if any, likelihood of the spring losing its resiliency

over extended periods of use, nor is this spring liable to break, as is the case of coil springs so frequently used for expansible bracelets or watch bands.

In order to attach the ends of the bracelet to a watch case or the like, such as indicated at 27 in Figure 18, the opposite ends of the bracelet support a connecting link, denoted generally 19, in Figures 3 and 4. The connecting link 19 comprises a sheet metal strip fabricated to define a pair of adjacent loops or sleeves 20 and 21, the sleeve 20 being approximately one-half the size of the link 10 so that it will overlie the outer link 11 of the inner row (Figure 9), the sleeve 20 being adapted to receive the leg 15 of the connector 14, and the leg can be fixed to the sleeve by soldering, but this is not necessary, since the connector, that is to say the leg 16 of the connector is held in the outermost link 11 by means of the spring 12. The sleeve 21 has a width dimension corresponding to the width dimensions of both rows of links, and a slot 22 is provided in proximity to each free end of the sleeve, the free end being bent outwardly, as shown at 23, for receiving a slide cover 24.

As shown in Figures 10 and 15, the watch case 27 is provided with a pair of arms 26, the arms being connected by a transversely extending member 25. The member 25 is adapted to be received by the sleeve 21, and Figures 12 to 15, inclusive show the steps of inserting and attaching the member 25 and, as a consequence, the watch case to the band. More specifically, the cover 24 is removed from the open end of the sleeve 21 and the member 25 turned through an angle of 90 degrees with respect to the position shown in Figure 15. The member 25 is then inserted into the sleeve 21, after which the cover 24 is again applied to the open end of the sleeve 21. Thereafter, the member 25 is again turned 90 degrees in the direction of the arrows shown in Figures 13 and 14 until it assumes the position illustrated in Figure 15. In this position, it can be seen that the inner faces of the arms 26 will prevent any longitudinal sliding movement of the cover 24 and thus prevent the cover from accidentally leaving the open end of the sleeve 21.

Figures 16 and 17 disclose two further forms of connectors which may be used, and in Figure 16 it can be seen that the sleeve 20A is disposed equidistantly of the end walls of the sleeve 21A, while in Figure 17 sleeves 20B and 21B are provided with planar walls rather than curved walls as is the case of Figure 16.

I claim:

1. In an expansible linkage having two rows of overlapping, staggered links, each link being disposed generally transversely to the longitudinal center line of the linkage when viewed from the top, the improvement comprising a first link in the first row of links having an opening extending into at least one side, an interconnecting member having a leg extending into said opening in a direction generally transverse to the longitudinal center line of the linkage and having means spaced from said leg for rotatably connecting the interconnecting member to the corresponding side of an adjacent link in the second row of links, means rotatably connected at the opposite sides of said first link and said adjacent link for connecting said sides together, whereby when the linkage is stretched longitudinally from contracted toward an expanded position said first link and said adjacent link are displaced relative to each other longitudinally of the linkage and

said leg is rotated relative to the walls of said first link, resilient means located within said opening in said first link and biased between one wall of said first link and said leg for engaging said leg and for resiliently urging and wedging said leg against a longitudinal wall of said first link in a direction generally transverse to the axis of said leg, a portion of said leg located between said resilient means and said longitudinal wall of said first link during rotation of the leg including means for occupying an increasingly greater distance between said resilient means and said longitudinal wall of said first link as said leg is rotated during movement of said first link and said adjacent link from their contracted towards their expanded positions, whereby said resilient means and said means for occupying an increasingly greater distance cooperate to urge the linkage from an expanded toward a contracted position.

2. An expansible linkage according to claim 1, wherein said resilient means comprises a leaf spring, which engages the leg and is compressed by the rotation of the leg during movement of the links from contracted toward expanded positions.

3. An expansible linkage according to claim 1, wherein the leg of the interconnecting member is provided with a notched area, and the resilient means comprises a leaf spring having an offset portion at the end which is adjacent to said notched area of the leg and which is adapted to be sprung into said notched area to retain the leg within the first link.

4. An expansible linkage according to claim 1, wherein the leg of the interconnecting member is provided with a notched area and the resilient means comprises a leaf spring extending longitudinally of the first link and having an angularly disposed area intermediate the ends of said first link engaging one wall of the first link and an offset portion at the end which is adjacent to the notched area of the leg, whereby the offset portion of the spring is urged into the notched area of the leg by the action of the angularly disposed area of the spring against the adjacent wall of the first link.

5. An expansible linkage according to claim 1, wherein the means for occupying an increasingly greater distance between said resilient means and said longitudinal wall of said first link comprises a portion of said leg of the interconnecting member which is of greater width than thickness.

6. In an expansible linkage having at least two rows of overlapping, staggered links, each link being disposed generally transversely to the longitudinal center line of the linkage when viewed from the top, the improvement comprising a first link having an opening extending into at least one side, an interconnecting member having a leg extending into said opening in said one side of said first link and having means spaced from said leg for rotatably connecting the interconnecting member to the corresponding side of an adjacent link in the second row of links, means rotatably connected at the opposite sides of said first link and said adjacent link for connecting said sides together, so that when said linkage is stretched longitudinally from contracted towards expanded position said first link and said adjacent link are displaced relative to each other longitudinally of the linkage by rotation of said interconnecting member and turning movement of said leg within said first link to

thereby increase the length of and expand the linkage, the maximum dimension generally transversely of said leg in one direction being greater than the maximum dimension generally transversely thereof in another direction and when the linkage is in a contracted position said maximum dimension of said leg extending generally longitudinally of the linkage, and resilient means located within said first link and biased between a wall of said first link and said leg for engaging said leg and resiliently urging and wedging said leg against a longitudinal wall of said first link, whereby the turning movement of said leg in said first link which results upon rotation of said interconnecting member during stretching of the linkage is opposed by said resilient means and said linkage is urged towards a contracted position.

7. An expansible linkage comprising at least two rows of staggered, overlapping links, the links of at least one of said rows being hollow and having open sides, each link of said rows of links being disposed transversely to the longitudinal center line of the linkage, interconnecting means having legs extending into one open side of each of said hollow links of the first row for interconnecting each of said hollow links of the first row with the two adjacent links in the adjacent row of links, means rotatably connected at the opposite sides of each of said hollow links of the first row and two adjacent links of the adjacent row for connecting such sides together, whereby when the ends of the linkage are stretched longitudinally from a contracted to an expanded position the links of each row are displaced longitudinally by rotation of said interconnecting means and turning movement of said legs within said hollow links results, resilient means, located within each of said hollow links of the first row and biased between one wall of said hollow link and at least one of said legs, for engaging said leg and for resiliently urging and wedging said leg against a longitudinal wall of said hollow link in a direction generally transverse to the axis of said leg, the portion of said leg which is located between said resilient means and said wall including means for prying said resilient means in a direction away from said wall and against the force exerted on said portion of said leg by said resilient means as said leg is turned during movement of said hollow links and said adjacent links from contracted towards expanded position, whereby said resilient means and said means for prying said resilient means away from said wall cooperate to urge the linkage from an expanded towards a contracted position.

8. An expansible linkage comprising spaced rows of links, each link having an opening extending into at least one side, the rows of links being disposed transversely to the longitudinal direction of the linkage, one row of links being arranged above the adjacent row of links, the links of one row being staggered and overlapping with respect to the links of the adjacent row, means for interconnecting each of the links of one row with two adjacent links of the adjacent row, said interconnecting means comprising a pair of U-shaped members, one leg of each U-shaped member extending into the said opening in the side of a link in one row and the other leg extending into the corresponding opening in the side of an adjacent link in the adjacent row, means rotatably connected at the opposite sides of said link in one row and the two adjacent links of the adjacent row for connecting said sides together, whereby each link of one row is connected with two adjacent links in the adjacent row and when the ends of the linkage are stretched longitudinally from a contracted towards an expanded position the links of each row are displaced longitudinally and said U-shaped members are rotated and turning movement of said legs within said links results, each of said legs having a resilient means engaging portion which is of greater width than thickness, and resilient means, disposed within each of the links and biased between a wall of said link and the engagement portions of the legs which are located within the link for engaging said engagement portions and resiliently urging and wedging said legs against a longitudinal wall of said link in a direction generally transverse to the axes of said legs, said U-shaped members, when the linkage is contracted, being positioned with the greater widths of their legs lying in a direction generally transverse to the direction in which the legs are urged by the resilient means, whereby the turning movement of the legs which results from rotation of the U-shaped members during expansion of the linkage is opposed by said resilient means and said linkage is normally urged towards a contracted position.

9. An expansible linkage comprising spaced rows or links, each link having an opening extending into each side thereof, the rows of links being disposed transversely to the longitudinal direction of the linkage, one row of links being arranged above the adjacent row of links, the links of one row being staggered and overlapping with respect to the links of the adjacent row, means for interconnecting each of the links of one row with two adjacent links of the adjacent row, said interconnecting means comprising a pair of U-shaped members, one leg of each U-shaped member extending into the opening in one side of a link in one row and the other leg extending into the corresponding opening in the side of an adjacent link in the adjacent row, a second pair of U-shaped members, one leg of each of said second U-shaped members extending into the opening in the opposite side of said link in one row and the other leg extending into the corresponding opening in the side of said adjacent link in the adjacent row, whereby each link of one row is connected with two adjacent links in the adjacent row and when the ends of the linkage are stretched longitudinally from a contracted towards an expanded position the links of each row are displaced longitudinally and said U-shaped members are rotated and turning movement of said legs within said links results, each of said legs having a spring engaging portion which is of greater width than thickness, and a leaf spring, disposed within each of the links, said spring being bent intermediate its ends with its bent portion resting against a longitudinal wall of said link, one of the ends of said spring engaging the legs of the U-shaped members extending into the opening in one side of the link to wedge such legs against a longitudinal wall of said link and the other end of the spring engaging the legs of said second pair of U-shaped members which extend into the opening in the opposite side of said link to wedge the last mentioned legs against a longitudinal wall of said link, so that said spring resiliently urges and wedges said legs against the longitudinal wall of the link in a direction generally transverse to the axes of the legs, said U-shaped members, when the linkage is contracted, being positioned with the greater widths of their legs lying in a

direction generally transverse to the direction in which the legs are urged by the spring, whereby turning movement of the legs which results from rotation of the U-shaped members during expansion of the linkage is opposed by said spring and said linkage is normally urged towards a contracted position.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
2,267,968	Augenstein	Dec. 30, 1941

FOREIGN PATENTS

Number	Country	Date
503,650	Germany	July 25, 1930
251,199	Switzerland	Jan. 14, 1946
935,687	France	Feb. 9, 1948
45,678	Switzerland	Nov. 4, 1908