Three link connector wherein the links may be relatively angularly varied

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The invention has as its object a device permitting two articulated elements to be arranged and secured in either of at least two alternative relative positions along at least two different directions in a plane in which they have a freedom of movement, when secured in one of said positions, which is very much less than the angle between these two directions, the device being characterized by the fact that one of the elements, assumed to be fixed, carries an arcuate hinge pin on which a U-shaped spring is pivoted by holes adjacent to the ends of its limbs so as to be able to turn in a plane at right angles to the plane of the arc, the limbs of the spring having respective recesses in their outwards facing sides capable of receiving elastically pairs of projections defining the mouths of two notches in an arcuate member coaxial with the arcuate hinge pin, the angle subtending these two notches being equal to that between the two aforementioned directions so that the spring may be turned in one direction about the hinge pin to disengagement the recesses from the projections of one of the notches, then slide along the hinge pin to register with the other notch whereafter the spring can be turned in the opposite direction to put the recesses in engagement with the pair of projections of the said other notch, the end of the spring which forms the bight of the U being adapted to be connected to the second (assumed to be mobile) of the two elements considered.

The invention is more particularly, but not exclusively applicable for transforming into a necklace an articulated bracelet to which an extension is connected in any known manner to give it the necessary length, and it is this particular application which will be hereinafter described.

It is well known to those skilled in the art that numerous kinds of ladies' jewels such as bracelets or necklaces are constituted by a series of elements or links, each comprising a generally flat frame supporting ornamental pieces such as gems or engraved noble metals; said links are hinged to each other about axes transverse to the length of the assembled jewels, in such a manner that every link frame may rest substantially flat against the wrist or the bust of the lady wearing the jewel. In other words, the links of a bracelet resting on a horizontal surface, such as that of a table, will have their frames practically in the same horizontal plane. Said plane will hereinafter be termed the plane of the assembled jewel. Such articulated jewels, in contra-distinction with bracelets or necklaces made of stringed pearls or the like, are practically deprived of any freedom of movement in their plane, due to the fact that the hinges are not universal joints or Hooke's couplings, but simple pivots. Consequently, if it is desired to lengthen, in a suitable manner an articulated bracelet so as to convert it into a necklace, for example, by interconnecting two identical bracelets end to end, only a poor esthetic result is obtained because the articulation of the elements or links of the bracelet only permits them to have a movement which is very limited in their plane so that the necklace obtained is almost circular or slightly elliptical and does not terminate as generally preferred, in a point or a V-shape. The invention permits of remedying this inconvenience in a simple manner, but it is not limited to this particular use and may have numerous other applications.

One embodiment of the invention is shown diagrammatically in the attached drawings.

FIGURE 1 is an underneath plan view illustrating the application of the invention to the frame of a link of an articulated bracelet which is transformable into a necklace;

FIGURE 1A is a similar view of a variant, showing different angular positions possible for two adjacent links of an articulated bracelet;

FIGURE 2 is a perspective view corresponding to FIG. 1 and illustrating the attachment of the spring, its arcuate pivot, the adjacent part of the link frame, and the coacting notches and pairs of projections;

FIGURE 3 is a section on the line III—III of FIG. 2; and

FIGURES 4 to 6 are elevations of three alternative types of collars which can be used for locating the arcuate pivot for the spring.

FIGURES 1 and 1A show two kinds of a link constituting the middle element of an articulated bracelet according to the invention, and which will be referred hereinafter as the links A. In FIGURES 1, 1A and 2 are shown at 1 and 2 coaxial rings forming the main part of the frame of the link. Said frame may carry an ornamental piece 23 made for example of engraved noble metal with or without mounted brilliants, pearls or the like. The piece 23 may be secured to the rings 1 and 2 by any suitable means, for example, by being welded at 24 to a plurality of radial members 3 or 3a welded to the rings 1 and 2. The connection of the link A to the adjacent links B and C, which are of conventional form, will be hereinafter disclosed. Two of these radial members, designated 3a, carry respective fixing collars 4 which are welded to them and are each provided with a hole 5. In these holes are located the respective ends of a rigid metal wire 6 which is curved arcuately to be coaxial with the rings 1 and 2. This wire is preferably also supported at two points intermediate its ends by collars 7 which are each provided with a hole 8 and, at the same time, form additional radial members interconnecting the rings 1 and 2; or instead of the collars 7 use may be made of collars 9 welded to the ring 2 and provided with a recess 10 to receive the wire 6. The ends of the wire 6 may be screw-threaded to receive nuts (not shown) to abut the fixing collars 4 for locating the wire.

On the wire 6, which forms a part circular guide, is pivoted a plate spring 11 which is bent to a U-shape so as to form two parallel limbs 11a and 11b. For this purpose the limbs of the spring, in the vicinity of their free ends, are provided with holes 12 to coat with the wire; and the spring is also provided with similar holes 13 adjacent the bight of the U for receiving an axle 14 for connecting the link A with an adjacent link of the bracelet generally indicated at B and which will be described hereinafter. The outer faces of the limbs of the spring are formed with recesses 15, and their lower edges are rounded as shown at 16. The limbs 11a and 11b are normally parallel but may be brought together if a lateral pressure is exerted on them in the direction of the arrows F of FIGURE 3.

On the other hand the ring 2 has, on an arc subtending the same angle at the centre as the wire 6, a reinforcement 17 provided with two interruptions or notches 18 and 19. Each of these notches has two projections 20 and 21 which are adapted to co-operate with the projections 15 of the spring limbs. The distance which separates these projections is sufficient to allow the limbs of the spring to pass when they are brought together to the maximum extent, and the rounding of the limbs at 16 facilitates the introduction of the springs into the notches. In FIGURE 3 the spring is shown, in full lines, in contact with the projections 20 at the point of being introduced.
into the notch, and in dotted lines the same spring is shown as having been pushed to the bottom of the notch. Finally, a radial arm 22, almost diametrically opposite the position of the spring 11 which corresponds to a straight development of the assembled bracelet resting on a table, is connected to the frame 1, 2, and 3 and constitutes a connecting piece which carries the pivoting connection 25 of the adjacent link C of the bracelet. The arrangement of the assembly is such that when the spring 11 is engaged in one or other of the two notches 18 and 19, the interconnected links of the bracelet are firmly held in the selected relative attitude.

The links B and C are generally similar to each other and to the other links (not shown) of a bracelet. Each comprises a frame 26a or 26b carrying an ornamental piece 27 similar to the part 23 of link A. The frame 26a of the link B is pivoted connected to the axle 14 by means of two small bearings 14a of substantially triangular shape welded to the spokes of the frame 26a, while the frame 26b of the link C is similarly connected to the pivot 25 by means of two small bearings 26a' of substantially triangular shape welded to the spokes of the frame 26b. The frame 26a or 26b is welded an axle 28 secured to a member 29 connected to a pivoting connection 30 for a further link (not shown). The members 29 are diametrically opposite, in each link B or C, to the spring 11 or to the arm 22 as the case may be.

The position of the device is as follows:

Assuming that the device of the invention is to be utilised as a connecting link forming part of a bracelet, the springs 11 would be set for the various links to be disposed substantially along a straight line in a horizontal plane, although if one takes into account the slight lateral mobility of the links relatively to each other the line could be curved instead of straight.

If it is now desired to convert the bracelet into a necklace, a suitable extension is attached to each half of a standard clasp (for example of a second and identical bracelet). The necklace obtained however will still be circular because the normal joining of the elements gives all the links an equal reciprocal inclination. To obtain, for example, pointed or V-shape in the jewel, whereby to be more agreeable to the eye, the device is adjusted as follows.

The spring 11 is initially in place in a notch, for example, 19 (i.e., in the position shown in broken lines in FIGURES 1 and 3) where it is held by the engagement of the projections 21 and recesses 15. By squeezing the limbs 11a, 11b and causing the spring to pivot through 90° about the wire 6, the said limbs are disengaged from the recesses. The spring can now be slid along the wire 6 until it arrives opposite the notch 18 (i.e., to the position shown in full lines in FIGURE 1). In then lowering the spring its edges 16 are brought into contact with the projections 20 (i.e., the position shown in full lines in FIGURE 3), and by continuing this movement the spring is inserted into the notch 18 in which it is locked by the elastic separation of the limbs bringing the recesses 15 into engagement with the projections 20. The links B and C of the bracelet are now no longer aligned, or disposed on the same circumference, but are, at the given point, at an angle equal to that which separates the notches 18 and 19.

In the foregoing it has been assumed that there is only one spring device in the case in which the bracelet comprises an even number of elements or links. However, if there is an odd number of links it is necessary to provide the middle element with two symmetrical devices. In this case the wire 6 may form a continuous ring or have two arcs each less than 180°, and the original connection 22 would be dispensed with and replaced by a second spring such as 11.

It must be understood that the embodiment described and shown is only by way of example and may be subjected to numerous modifications without departing from the spirit of the invention. In particular one could generalise the system by providing more than two different angular positions, or by effecting the fixing of the wire pivot by means other than those which have been described. Likewise one could provide several pairs of notches with which springs such as 11 would co-operate, certain of these springs being capable of not being connected permanently to any part but to receive, at will, such a part if desired.

FIG. 1A shows a modification as hereinbefore suggested, with different possible positions of the links. The reference numerals are the same as previously except for link A', B', C', etc. The ends of the wire 6' are screw threaded and are fixed to two radial members 3'a by means of nuts 6'a, and at least one intermediary collar 7' divides the wire 6' into two sections. The outer ring 2' is provided with two pairs of notches 18', 19', and 18'a, 19'a. The notches 18', 19' being on one side of the collar 7' and the notches 18'a, 19'a on the opposite side of said collar. Consequently the links attached to link A' are permitted to take, at will, the respective positions shown in full lines at B' and C' or in dotted lines at B'1 and C'1.

I claim:

1. A connector permitting a first and a second articulated element joined thereby to be arranged and secured in either of at least two alternative relative positions along at least two different directions in a plane in which said elements have freedom of movement, when so secured, which is very much less than the angle between these two directions, comprising an arcuate pivoting and guiding member of circular cross-sectional connection to a first of the elements, a coxial arcuate locking member spaced from said first named arcuate member and joined to said first element and having two loci provided except for a notch, at a distance equal to the angle between the said two directions, an axle joined to the second element and a connecting spring member carried by the said axle and pivotedly supported from the said pivoting and guiding member so as to be able to be turned about the said spring slid along it into registration with either locking notch, and said spring member having means thereon capable of being engaged elastically (with a snap action) in the selected notch.

2. A connector according to claim 1, in which the connecting member is constituted by a U-shaped spring of which each limb is provided with two holes, one of the holes in each limb being in the vicinity of the free end and of a diameter a little greater than that of the pivoting and guiding member, and the other hole in each limb being in the vicinity of the bight of the U and of a diameter a little greater than that of the aforementioned axle, the outer face of each limb having a recess spaced from the hole adjacent its free end by an amount substantially equal to the distance between the pivoting and guiding member and the locking member, said recessed limbs constituting the aforesaid means, and the aforementioned notches having at their openings projections directed towards each other and capable of being engaged elastically surfaces of the said recesses, the distance between the outer faces of the two limbs of the U, when unstressed, being greater than the distance between the tips of the projections of a respective notch.

References cited in the file of this patent

UNITED STATES PATENTS

1,847,595 Cartier 1,932