Dec. 21, 1948. M. E. EDWARDS 2,456,820

SAFETY PIN

Filed Jan. 12, 1946

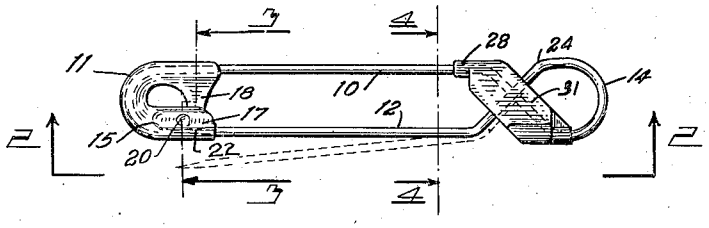


Fig. 1.

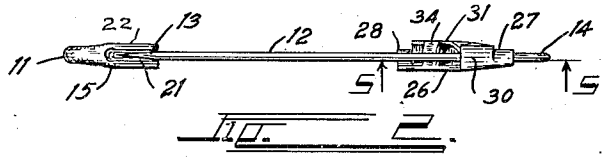


Fig. 2.

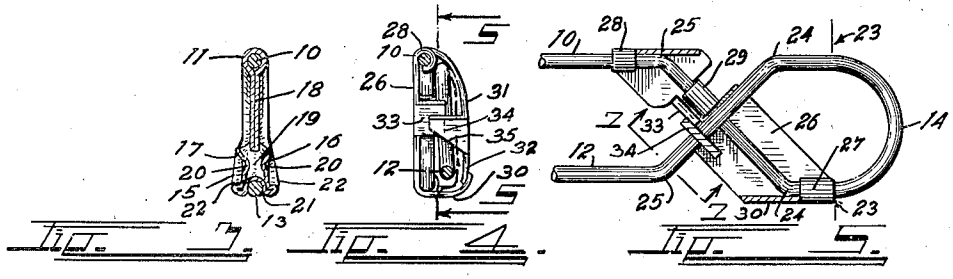


Fig. 7. Fig. 4. Fig. 5.

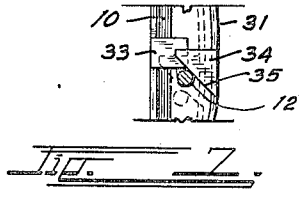


Fig. 7.

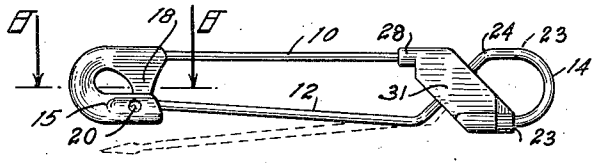


Fig. 6.

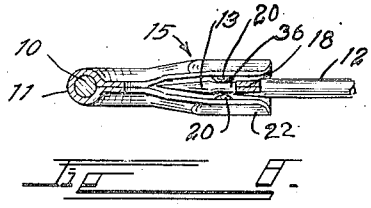


Fig. 8.

INVENTOR.
M. E. EDWARDS.
BY
Martin E Anderson
ATTORNEY.

Patented Dec. 21, 1948

2,456,820

UNITED STATES PATENT OFFICE

2,456,820

SAFETY PIN

Masena E. Edwards, Denver, Colo.

Application January 12, 1946, Serial No. 640,761

4 Claims. (Cl. 24—161)

1

This invention relates to improvements in safety pins.

Ordinary safety pins are used largely for fastening infants' clothing and are admirably adapted for this purpose. Safety pins, when open, have their pointed ends exposed and it has happended that infants have swallowed such open pins, with very serious results. Because the point of an open pin is in position to penetrate the mucous membrane of the throat, stomach and/or intestines, it is difficult to remove and will not pass through the intestinal tract.

It is the principal object of this invention to produce a safety pin of such construction that the sharp point of the pin will, at all times, be practically covered, thereby eliminating the danger of possible injury to the hands and fingers while handling it and also eliminating, to a great extent, the danger attending the swallowing of such a pin while it is in, so-called, open position.

Another object is to produce a safety pin of such construction that the pointed end can be moved from sheltered or protected position to open position by exerting pressure on certain parts thereof.

A further object is to provide a pin that shall be latched in such a way that forces tending to open it will be resisted.

Another object is to produce a pin of such construction that the pointed end will, at all times, be biased to a protected position and in which the pointed end can be moved to fully open position without subjecting the material to strains that result in a permanent set.

The above and any other objects that may become apparent as this description proceeds are attained by means of a construction and an arrangement of parts that will now be described in detail and for this purpose reference will be had to the accompanying drawing in which the invention has been shown in its preferred form, and in which:

Figure 1 is a side elevation showing one form of the invention;

Figure 2 is an edge view of the pin, looking upwardly in Figure 1;

Figure 3 is a section taken on line 3—3, Figure 1;

Figure 4 is a section taken on line 4—4, Figure 1;

Figure 5 is a section taken on line 5—5, Figure 4;

Figure 6 is a side elevation similar to that shown in Figure 1 and shows the position of the

2

pointed leg, when in open position, by broken lines;

Figure 7 is a section taken on line 7—7, Figure 5; and

Figure 8 is a section taken on line 8—8, Figure 6.

The safety pin consists of an elongated frame formed from a single piece of spring wire. The frame has a leg to the free end of which the U-shaped keeper 11 is attached. The other leg of the frame has been designated by reference numeral 12 and is pointed as indicated at 13, in Figure 2. The wire from which the frame is constructed is bent at its middle into a loop 14. Keeper 11 is secured to the free end of leg 10, the latter being preferably curved so as to hold the keeper firmly against relative rotary movement thereon. The side of the keeper to the bottom in Figure 1 has been designated by reference numeral 15 and has two spaced parallel walls 16 and 17 as shown more particularly in Figure 3. Extending downwardly from the side of the keeper secured to leg 10 is a tongue 18 that projects a short distance into the space between walls 16 and 17. The space between walls 16 and 17 forms a groove 19 in which the pointed end 12 is positioned when the pin is closed. Walls 16 and 17 have inwardly extending projections 20 which serve to frictionally latch the pointed end of leg 12 in position when the pin is closed. Side 15 of the keeper is provided on its outer surface with a longitudinally extending groove 21 for the reception of the pointed end 13, when the pin is in open position. The legs 10 and 12 are biased towards each other and therefore when the pin is in open position, point 13 will normally be positioned in groove 21, as shown in Figure 3, whereby its point will be protected so that if the pin should be accidentally swallowed by a child, point 13 would not be in position to penetrate any of the mucous surfaces of the digestive tract. In addition to the two grooves 19 and 21, the keeper is provided with outwardly extending flanges 22 that also serve as guards for the point 13 in case the latter should not be positioned in groove 21, but be on the outside of either one of walls 16 or 17.

Since leg 12 is biased towards leg 10, it is evident that the safety pin will not, by itself, move to the open or dotted position shown in Figure 1 and unless means is provided to effect an outward movement, the pin would be difficult to insert into a piece of cloth by the use of one hand alone. For the purpose of spreading the

legs so as to bring leg 12 to the dotted line position, a special spreading means has been provided which will now be described.

Referring now more particularly to Figures 4 and 5, it will be seen that loop 14 is formed on a semi-circle to the diameter 23, from point 23 to point 24 the wire is straight, and from point 24 to point 25 the wires extend diagonally and cross each other as clearly shown in Figure 5. A frame comprising a piece of spring metal such as spring brass or bronze is secured to the parts in the following manner. The frame has one side 26 extending diagonally or parallel to the part 24, 25 of leg 10 and is secured to the frame at points 27 and 28 by having portions thereof bent around the wire. A tongue 29 is also curved around that portion of leg 10 that extends diagonally between points 24 and 25. The frame has a side 30 that curves upwardly and thence inwardly as shown in Figure 4. The other end of the frame terminates in a flexible member 31 whose end is positioned inside of the curved end of part 30, terminating at point 32. Part 26 has a tongue 33 bent upwardly in the manner shown in Figure 4 and this forms a stop for the diagonal portion 24, 25 of leg 12, and in addition forms a guide for the cam 34. It will be observed that cam 34 has an inclined side 35 that is normally in engagement with the diagonal part of leg 12 as shown in Figure 7. Whenever side 31 is pressed inwardly, the inclined cam surface 35 will move the diagonal part of leg 12 downwardly, when viewed as in Figures 4, 5 and 7, thereby moving the leg 12 to the dotted line position shown in Figure 1. When pressure is removed from part 31, the cam moves outwardly, thereby permitting leg 12 to move inwardly to the full line position shown in Figures 1, 2 and 3.

It will now be apparent that the pin can be manipulated by one hand because when it is to be inserted into a garment pressure is applied to the frame urging part 31 with its cam 34 inwardly in a direction transverse to the plane of the frame, thereby opening the pin. When pressure is removed the parts return to the full line position shown in Figure 1.

After the pin has been inserted into a garment, such as a child's diaper, the pointed end of leg 12 is moved into the groove 19 to a point below the inwardly extending projections 20 into the position shown in Figures 6 and 8.

From Figure 8 it will be observed that the pointed end 13 of leg 12 has a portion 36 of decreased diameter so that after it is in the position shown in Figure 8, any relative longitudinal movement of leg 12 with respect to the keeper will be resisted.

Attention is called at this point to the fact that leg 12 can be moved outwardly towards the dotted line position shown in Figure 1 to a greater extent than that shown without causing a permanent set in the wire for the reason that when such outwardly movement is effected by a force applied directly to the leg, the bending strains will be absorbed by the loop 14 as the wire moves away from the cam surface 35.

From the above description, taken on connection with the drawings, it will be evident that the safety pin that forms the subject of this invention is provided with several safety features and a normal operating means. Due to the inward bias of leg 12 with respect to the keeper, it will normally assume a position either like that shown in Figure 2, or against the one side

or the other of part 15 of the keeper, in either of which positions point 13 will be shielded, and therefore, if the pin should accidentally be swallowed, the point will not be in position to penetrate the walls of the alimentary canal as above pointed out.

In addition to this safety feature, the means for opening the pin by pressure exerted on parts 26 and 31 enables the user to open and insert the pin by the use of one hand alone, which is of considerable importance in many cases.

Due to the interlocking action between the inwardly extending projection 20 and the pointed end of leg 12, the force required to open the pin will be greater than if such interlock were not present. The usual safety pin, when subjected to a longitudinal stretching force permits the point of the movable leg to pull out of the shield, whereas in the present construction this is resisted by the means described.

Attention is here directed to a feature of the construction that is of great importance. It has been explained above that leg 12 is biased towards leg 10 for the purpose of automatically bringing the point into groove 21 or into a position where the point will be guarded by flanges 22. Tongue 33 serves as a stop and is so positioned that the diagonal portion of leg 12 will engage the edge of tongue 33 whenever the free end is moved inwardly to bring it into position to enter groove 19. As soon as the diagonal portion comes into engagement with the edge of tongue 33 any further movement will bend leg 12 about that point as a fulcrum with the result that the free end will move into and towards the bottom of groove 21. It will now be apparent that the normal bias will serve to position point 13 either in groove 21 or adjacent the ridges 22, and that after the leg has been bent so as to enter groove 19, it will tend to move outwardly towards the bottom of this groove. The inward projections 20 serve to resist relative longitudinal movement of leg 12 and the keeper, as above explained.

What I claim as new is:

1. A safety pin comprising, an elongated frame formed from a single piece of resilient wire, the two legs being connected by at least one complete loop, the legs crossing each other adjacent the loop, one end terminating in a sharp point and the other in a substantially U-shaped keeper, the legs being biased towards each other to normally hold the pointed end in engagement with the outer surface of the keeper, the latter having a depressed area for the reception of the pointed end, the keeper having a groove on its inside for the reception of the pointed end when the pin is in closed position, and means comprising a cam attached to the frame adjacent the loop for engagement with the leg having the pointed end and movable transversely of the frame, for moving the pointed leg to open position.

2. A safety pin comprising, in combination, an elongated frame of resilient wire formed at one end into a loop, the wires crossing adjacent the loop and terminating in two legs one of which is pointed and the other of which is curved towards the pointed end, a horseshoe shaped keeper secured to the curved end, the side of the keeper facing the curved leg having a groove on its inner surface and another on its outer surface, the pointed leg being biased to normally assume a position in which the point is positioned in the outer groove, means comprising a stop secured to the frame adjacent the loop, in posi-

tion to be engaged by a portion of the pointed leg to limit its inward movement in response to the biasing force, and means comprising a cam positioned adjacent the stop and movable transversely of the frame for engagement with the pointed leg to move the same to open position in opposition to the biasing force.

3. A safety pin comprising, in combination, an elongated frame of resilient wire, bent intermediate its ends to form a loop, the wires adjacent the loop crossing and terminating in substantially straight legs, the end of one leg being pointed and the other curved towards the pointed end, a horseshoe shaped keeper secured to the curved end, the side of the keeper near the pointed end having a groove facing the curved end and another groove on the outer surface, the pointed leg being biased towards the curved leg to normally seek a position with its point in the outside groove, a stop carried by the frame adjacent the loop in position to engage a portion of the wire forming the pointed end to limit its inward movement in response to the biasing force, and a cam mounted on the frame, adjacent

the loop, for movement transverse to the plane of the frame, for engaging the wire forming the pointed leg to move the pointed leg towards open position in opposition to the inwardly acting biasing force.

4. A safety pin in accordance with 3 in which the inwardly facing grooves have opposed inwardly extending projections and in which the pointed end is of greater diameter than the distance between the projections to form an interlock resisting force tending to move the keeper relative to the pointed leg.

MASENA E. EDWARDS.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
842,600	Willis	Jan. 29, 1907
2,006,923	Jones	July 2, 1935
2,093,630	Bowker	Sept. 21, 1937
2,145,313	Morley	Jan. 21, 1939