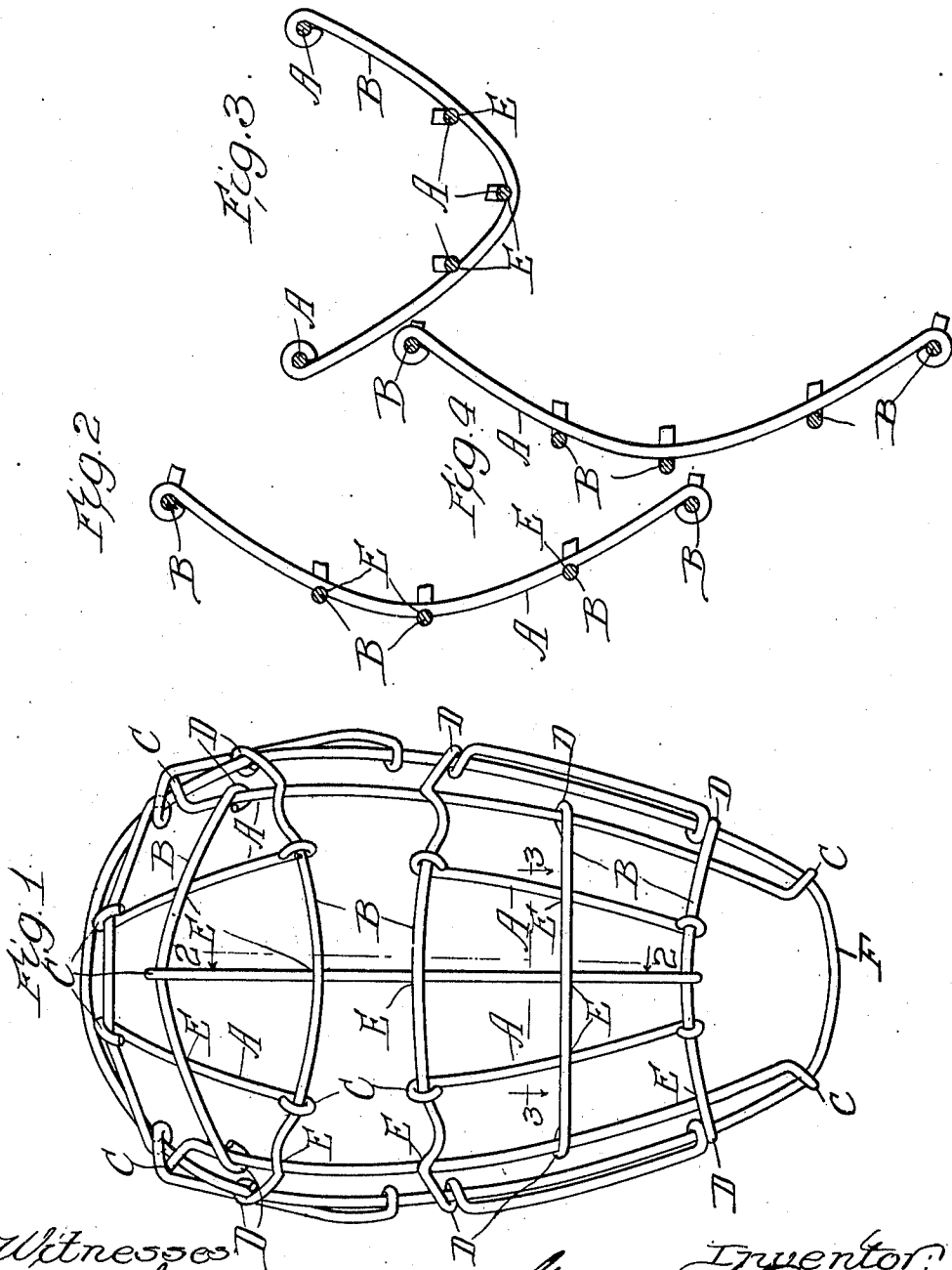


G. K. RIX.
WIRE FRAME.
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990,166.

Patented Apr. 18, 1911.



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UNITED STATES PATENT OFFICE.

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WIRE FRAME.

990,166.

Specification of Letters Patent.

Patented Apr. 18, 1911.

Original application filed February 3, 1909, Serial No. 475,840. Divided and this application filed July 1, 1909. Serial No. 505,532.

To all whom it may concern:

Be it known that I, GEORGE K. RIX, citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Wire Frames; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to a novel construction in concavo-convex wire frames, the object being to provide devices of this character having certain particular and peculiar characteristics by which said frames are rendered more stiff, durable and resilient than ordinarily and by means of which the cost of producing the same is materially reduced and in which the use of special reinforcing means at the points of intersection of relatively transversely disposed wires are omitted whereby said frames are rendered neater in appearance.

The invention consists in the novel features of construction hereinafter fully described and claimed.

In the accompanying drawings illustrating my invention: Figure —1— is a front elevation of a baseball mask exemplifying a concavo-convex wire frame constructed in accordance with my invention. Figs. —2— and —3— are respectively fragmentary detail longitudinal and transverse sections of the same on the lines 2—2 and 3—3 of Fig. —1—. Fig. —4— is a view similar to Fig. —2— showing the wires in their relative positions prior to the finishing operation.

This application is a division of my application for Letters Patent for wire frames and methods of making same, filed February 3, 1909, Serial No. 475,840, which resulted in the issue on September 7, 1910, of Letters Patent No. 933,342.

The frame constituting the subject of this application is the product of the method described and claimed in the aforesaid Letters Patent and the peculiar and particular characteristics constituting the novel features of the said frame are produced by the particular method of making the same.

In the manufacture of concavo-convex

wire frames of the heavy grades in particular and in which a large number of relatively short pieces of heavy wire are employed, as for example in baseball masks, it is primarily very difficult to keep the respective wires in proper relative position. Owing to the weight and stiffness of the wire employed in the manufacture of these frames it is primarily necessary to first bend the wires composing the frame each into its proper shape and then assemble said wires. The assembling is effected by looping the ends of the respective wires over transversely extending wires disposed either at the edge portion or at other points in the frame. In contracting the loops around the wires embraced thereby it is endeavored to clamp them as tightly as possible, but it will be obvious that slippage of the wires cannot possibly be avoided. Each of the wires composing the frame and which extends inwardly of the edge portion of the latter passes over or under other transversely extending wires between its ends and between the ends of the latter. It has been attempted to secure these wires together at the crossing or intersection points either by soldering, wiring or the use of clips of sheet metal and sometimes the clips or the wire are first disposed around such points and the latter then soldered. However, such frames are subject to very rough treatment and none of these joining means serves to hold the wires properly in relative position and furthermore the use of these means renders the points of intersection large and clumsy and present at these points one or more sharp projections which not only are liable to injure the hands of the users of the frames but in the case of baseball masks frequently rip and injure the covers of the balls striking the masks.

The wires when assembled in the frame and before being secured together at their points of intersection are loose and relatively free to move and each wire must bear the full strain imparted to it as such strains or stresses, (as they may be called) are not distributed to other wires and the weak nature of the joints effected at the point of intersection by means of solder and the like

cause such joints to give way and break under severer strains instead of distributing the latter to the wires to which the wire bearing the strain is secured.

5 The object of my invention is to provide a frame of this nature such as a baseball mask or other shapes as for example, lamp-
guards, baskets and the like, in which heavy
10 wire is employed in which all of the wires composing the frame are secured together at every point of intersection so that any strains or stresses imparted to one wire will be transmitted to the other wires and which said frame is, by reason of the method of con-
15 structing the same, inherently stiffer and more resilient than frames constructed in other ways.

In the construction of the baseball mask illustrated as exemplifying a concavo-convex
20 wire frame embodying my invention the arched longitudinal wires A are disposed inwardly of the arched transverse wires B, said wires being disposed respectively on the concave and convex faces of the frame. The
25 loops C and D at the ends of said wires are first inserted and contracted upon the wires engaged thereby and after completion of the structure the said wires A and B are welded together at each of the crossing points E
30 between their ends. An edge wire F is employed which constitutes the primary anchoring member to which some of the wires composing the body of the frame are secured or anchored at their terminals. It is not ma-
35 terial whether a few or all of the last-named wires are so secured to the edge wire as the points at which the wires A and B are anchored at their terminals depends entirely upon the nature and shape of the frames to
40 be produced.

The wires composing the frame are relatively very heavy in proportion to the dimensions of the frame itself and accordingly said wires are very stiff and relatively un-
45 yielding. After primarily completing the frame by assembling all of the wires in proper relative positions I impart to the wires A tension stresses and to the wires B compression stresses which become perma-
50 nent therein this being effected by shrinking said wires A and B partially into each other at all crossing points in the presence of welding heat whereby they are welded together and become homogeneous with each other
55 at all intersecting points between their ends. It will be obvious that in order to effect this the wire A on the concave face of the frame must be forced outwardly toward the convex face of the frame and the wires B
60 must be crowded in the opposite direction against the action of the wire or wires upon which said wires A and B respectively are anchored at their terminals. In this manner all of the slack, as it may be called, in the

wires is taken up and they are maintained 65 in their respectively crowded or displaced positions in a manner which may be compared to springs maintained normally under tension or under compression. All rattling or relative vibration of wires due to loose- 70 ness thereof is thus entirely overcome and a homogeneous structure results in which each of its composing members reinforces every other and wherein strains or stresses 75 imparted to one member are distributed over all in accordance with their respective positions therein.

The structure described differs materially from those which are made up by assembling wires in a flat plane and subsequently bend- 80 ing the resulting structure to concavo-convex shape as in the act of bending or forming the latter distortion and inequality in the composing elements results whereas by first making up the frame so that each of its com- 85 ponent elements is disposed in proper relative position and then welding the same together at the crossing points while forcing them slightly out of their normal positions in order to shrink them into each other each 90 of the component elements retains its original strength with the result that the completed structure is very much stronger.

The strength of a structure is that of its weakest part and accordingly a distorted 95 and thus weakened portion of a wire frame determines the strength of the frame. In avoiding distortion of any of the component elements of the frame the latter is assured against greater weakness in one part 100 than in another.

In the act of welding the wires are heated to a high degree and are expanded and in cooling they shrink but the shrinkage cannot pull them from the welded joints and 105 must therefore be taken up at the terminals and between adjacent welded joints.

I claim as my invention:

1. A concavo-convex wire frame comprising two sets of relatively transversely dis- 110 posed arched wires, and an edge wire, each of said arched wires anchored at its terminals to transversely disposed wires, and homogeneous between its ends with inter- 115 secting transversely disposed wires, said wires being inherently under permanent tension and compression stresses, substantially as described.

2. A concavo-convex wire frame comprising two sets of relatively transversely dis- 120 posed arched wires, said respective sets of wires being respectively disposed on the concave and convex faces respectively of the frame, an edge member for the frame constituting an anchor for the arched wires, the 125 latter secured at their ends to the said edge member, said respective sets of arched wires homogeneous with each other at their points

of intersection between their ends, said set thereof on the concave face of the frame being inherently under permanent tensile stresses, and said set on the convex face of the frame being inherently under permanent compression stresses, substantially as described.

In testimony whereof I have signed my name in presence of two subscribing witnesses.

GEORGE K. RIX.

Witnesses:

G. A. JOHNSON,
W. B. RIX.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."
