No. 834,895. PATENTED NOV. 6, 1906.

F. E. FARNHAM.

PIN AND JOINT.

APPLICATION FILED JULY 8, 1905.

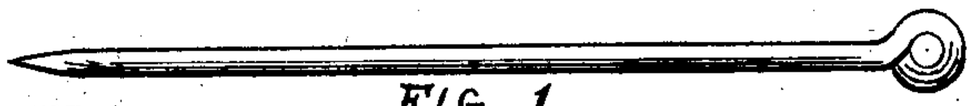

FIG. 7.

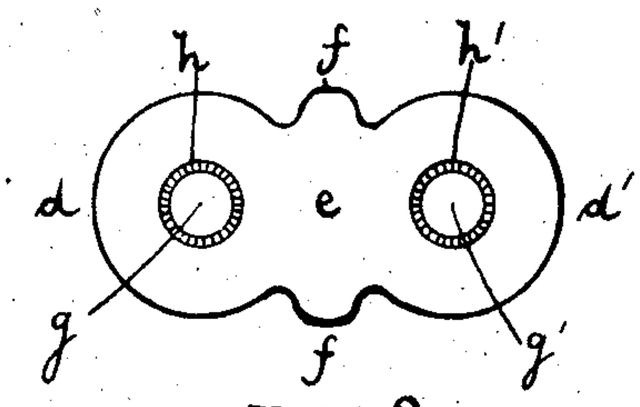

FIG. 2.

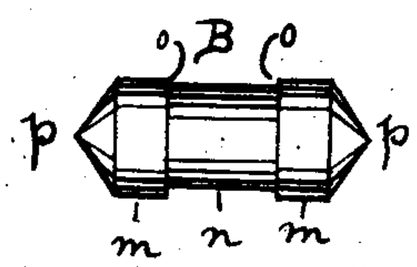

FIG. 3.

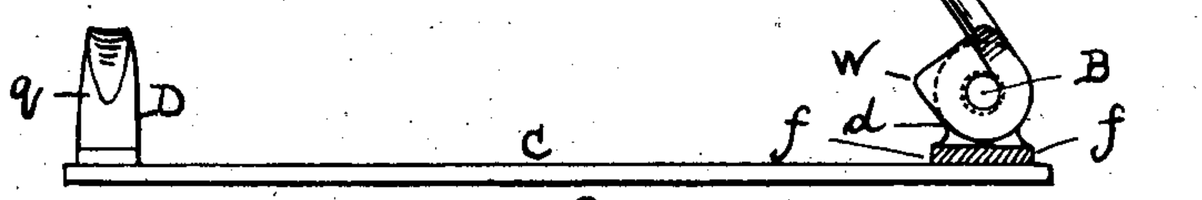

FIG. 8.

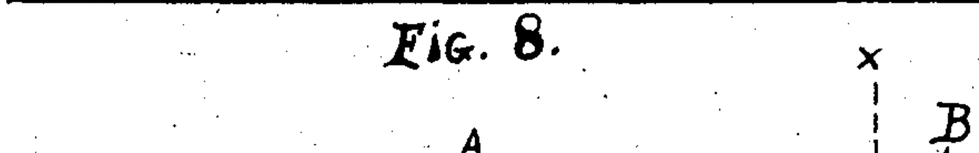

FIG. 5.

FIG. 6.

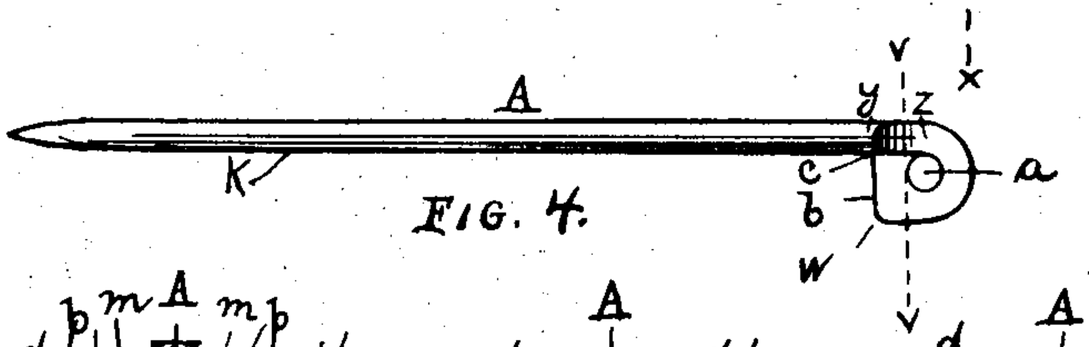

FIG. 4.

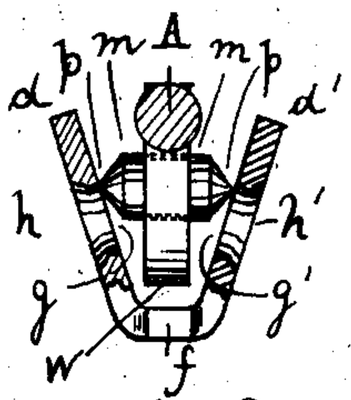

FIG. 9.

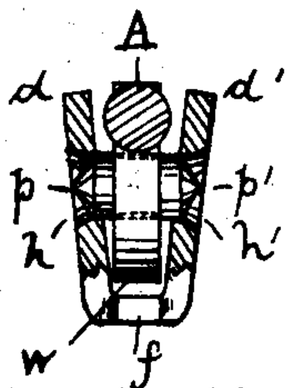

FIG. 10.

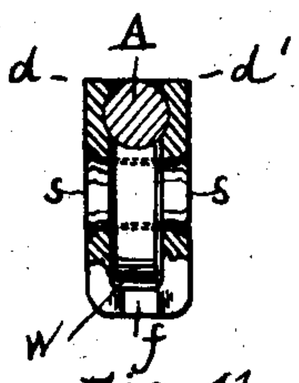

FIG. 11.

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PIN AND JOINT.

No. 834,895. Specification of Letters Patent. Patented Nov. 6, 1906.

Application filed July 8, 1905. Serial No. 268,860.

To all whom it may concern:

Be it known that I, FRANK E. FARNHAM, a citizen of the United States, residing at Providence, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Pins and Joints, of which the following is a specification, reference being had therein to the accompanying drawings.

Like reference-letters indicate like parts in all the figures.

Figure 1 shows in front elevation the wire-blank from which my improved pin-tongue is made, said wire having one of its ends pointed and the opposite end made into a round loop. Fig. 2 is a plan view of the blank from which the earpiece of my improved joint for brooches is made. Fig. 3 is a front elevation, on an enlarged scale, of the pivot of my improved pin-joint. Fig. 4 is a front elevation of my improved pin-tongue. Fig. 5 is a front elevation of said pin-tongue with the pivot extending through the pivot-hole in the head thereof. Fig. 6 is a view of the same as seen on line $x\,x$ of Fig. 5. Fig. 7 is a front elevation, partly in section, of a brooch provided with a pin-catch and also with a pin tongue and joint embodying my invention. Fig. 8 is the same as Fig. 7, except that it shows the pin-tongue in its open position. Fig. 9 is a view, on an enlarged scale, of my improved pin-joint as seen in assembling the same, the pointed ends of the pivot being represented as about to enter the pivot-holes of the earpiece and said earpiece spread apart sufficiently for such insertion of the pivot and pin-tongue. Fig. 10 is a like view of said parts as seen in assembling, the pointed ends of the pivot being wholly contained within the pivot-holes of the earpiece and the ears being bent nearer together until the apex of the pointed end of the pivot on each side is in line with the outer plane surface of the adjacent ear. Fig. 11 is a like view of said parts when fully assembled and completed.

My invention relates to the joints and pin-tongues of brooches and similar articles; and it consists of the novel construction and combination of the several parts, as hereinafter described, and specifically set forth in the claims.

The pin-tongue is an improvement on that shown and described in Letters Patent of the United States No. 783,627, issued to me and dated February 28, 1905.

My improved pin-tongue is preferably made from a cylindrical wire of suitably-tempered metal (shown in Fig. 1) and provided at one end with a sharp point and at the opposite end with an open loop or eye formed by a circular bend of said wire. This cylindrical wire-blank is subjected to the action of a die and plunger in a swaging operation, by which said looped end of the wire is flattened and elongated. By the pressure exerted in this operation the metal constituting the circular loop of the wire-blank is caused to flow and to receive its shape in the die, the result being a pin-tongue having the peculiar form illustrated in Fig. 4. It is seen by an examination of Fig. 4 that the pivot hole or opening *a* lies wholly on one side of the pin-stem A instead of being centered in the axial line of the wire, as in Fig. 1; that the flattened sides of the pin-head are substantially parallel with each other; that the outer curved edge of the pin-head is in the arc of a true circle, or approximately so, and that the metal has flowed to form a broadened end *b*, the inner straight edge of which closes snugly to and conforms with the adjacent surface of the pin-stem A. This flow of the metal into a flattened shape of differing widths results in completely destroying the resiliency of the stock in the plane of said flattened head, and the closure of the portion *b* to the pin-stem A (represented in Fig. 4 by the line *c*) is almost imperceptible and practically constitutes a solid abutment, which is rigid and unchangeable notwithstanding any flexure of the pin-stem A, although the resiliency of the pin-stem itself is not impaired to any degree whatever. The line *c* is tangential to the circular pivot-hole *a*, as shown in Fig. 4.

By the use of the wire-blank shown in Fig. 1 and which has a circular loop whose center is in line with the axis of the stem of the blank a comparatively large amount of metal is provided, which can be made to flow, under die-pressure, so as to produce an excess of metal for the proper formation of the fulcrum-point *w* and the adjacent parts of the pin-head in front of the tangent line *v v* of the pivot-hole *a*, Fig. 4. The pivot-hole *a* is located wholly below the line *c*, as seen in Fig. 4, and said line *c* is in exact continuation of the line *k* in said figure, which represents the shortest side of the pin-tongue.

The blank from which the earpiece is formed is represented in plan view in Fig. 2.

It is made of a piece of flat stock cut by a die preferably into two opposite ears *d d'*, each of which has an edge extending in the arc of a circle to the extent of nearly two hundred and seventy degrees, said ears *d d'* being connected integrally by an intermediate base *e*, provided with lateral projections *f f*. The ear *d* has a central circular pivot hole or opening *g*, which, as best seen in Figs. 9, 10, and 11, is cylindrical half-way through said ear. In the outer half of the ear *d* the pivot hole or opening *g* is concentrically enlarged or reamed out, so as to have an outwardly flaring or beveled surface. (Indicated in Fig. 2 by *h*.) The ear *d'* is in all respects like the ear *d*, having a pivot-hole *g'* and a beveled concentric enlargement *h'*, said hole *g'* being tubular and extending half-way through the ear *d'* and the enlarged beveled hole *h'* being concentric and continuous therewith through the remaining half of the ear *d'*. In this manner the reamed enlargements *h h'* of the ears *d d'* are on the outer sides of said ears. Fig. 2 is drawn on an enlarged scale in order better to illustrate these details of construction.

The pivot B is shown on an enlarged scale in Fig. 3. It is preferably made of a comparatively soft metal, such as German silver, in order that when its opposite ends are compressed inwardly by means of pliers or some other suitable tool or implement said ends are upset or laterally spread by such operation. The pivot B has its two portions *m m* made cylindrical and of such diameter as to fit closely but slidingly in the pivot-hole *a* of the pin-tongue and in the pivot-holes *g g'* of the ears *d d'*. The central portion of the pivot is circumferentially grooved, as represented at *n*, so as to have there a slightly smaller diameter than that of the portions *m m*. This circumferential groove *n* results in the formation of two annular shoulders *o o*. Each end of the pivot B is pointed and formed in a conical shape, terminating in a sharp apex *p*.

C is the brooch or the back plate thereof. The earpiece is soldered at one end on the brooch or plate C, as seen in Figs. 7 and 8, and at the opposite end the pin-catch D is soldered to said brooch or plate and has the usual hook-shaped end *q* to engage the pointed end of the pin-stem A, as shown in Fig. 7.

The parts of said device are assembled as follows: The pivot B is inserted in the pivot-hole *a* of the pin-tongue by passing one of the cylindrical portions *m* thereof through said hole. As the diameter of said portion *m* is only a very little less than the diameter of the pivot-hole *a*, said cylindrical portion *m* of the pivot B passes through the pivot-hole *a* with a sliding but rather close fit; but as soon as the shoulder *o* has passed through the pivot-hole *a* the pivot B is loosely held by the pivot-hole *a*, some portion of the convex edge of which is then in the circumferential groove *n* of said pivot by the action of gravity. The result is that while the pivot B is loose within the pivot-hole *a* it cannot become wholly disengaged therefrom, because it is prevented from longitudinal displacement by the contact of some portion of one of the shoulders *o* against some portion of the convex edge of said pivot-hole. This partial engagement of the pivot B with the head of the pin-tongue is of great practical importance, because they are thus made inseparable from each other, and therefore the workman in taking up the pin-tongue also takes up with it by reason of this loose connection the pivot B, and it becomes unnecessary to give any separate manipulation to the pivot B itself in assembling the parts.

The earpiece, which constitutes the fixed hinged member of the joint, is soldered on the brooch or plate C, as seen in Fig. 7, when the ears or sides *d d'* are spread apart in the divergent angular position illustrated in Fig. 9. The projections *f f* extend longitudinally along the brooch or plate C, as seen in Figs. 7, 8, 9, 10, and 11. The workman then takes up a pin-tongue, having a pivot mounted loosely in the pivot-hole thereof, as already described, and inserts the head of the pin-tongue and said pivot between the ears or sides *d d'*, as illustrated in Fig. 9, moving the conical points or apexes *p p* at the ends of the pivot B to and into the tubular openings or pivot-holes *g g'* of said ears *d d'*. He then uses his pliers, pressing the inner faces of the jaws of said tool against the two outer surfaces of the ears or sides *d d'*, and by closing the handles of the tool together he bends the ears *d d'* inwardly toward each other.

As seen in Figs. 3 and 9, the conical ends of the pivot B have an angular inclination of about forty-five degrees, and as the apexes *p p* of said pivot are within the bores of the pivot-holes *g g'* the result of the inward bending of the ears *d d'*, caused by the pliers operating as described, is that the pivot is accurately guided and seated in the pivot-holes *g g'* of the ears *d d'*, and the parts come into the relative positions illustrated in Fig. 10, where it is seen that the apexes *p p* are flush with the lines of the outer surfaces of the ears *d d'*, respectively.

The continuing further pressure exerted by the closing of the inner faces of the jaws of the pliers together causes the apexes *p p* and the conical ends of the pivot B (which, as already stated, are of a comparatively soft metal) to be upset—that is, spread radially in lateral directions substantially at right angles with the axis of the pivot B, thus forming rivet-heads on both ends of the pivot, as illustrated in Fig. 11. These spread or upset ends of the pivot are indicated at *s* in Fig. 11, where it is seen that they fill (or nearly fill) the reamed holes *h h'* and that by this riveting action the ears *d d'* are drawn into snug

contact with the parallel plane surfaces of the flattened head of the pin-tongue. The pivot B is therefore firmly locked in position and cannot be moved longitudinally in either direction, because such movement is entirely prevented by the rivet-heads formed as described. The ends of the pivot B are secured immovably in the ears *d d'*, being tight therein; but the pin-tongue swivels loosely upon the central grooved portion of the pivot, being confined to a fixed line of oscillation, because of the sliding contact of the plane parallel surfaces of the flattened head of the pin-tongue with the inner plane surfaces of the ears *d d'*.

As seen in several of the figures, but most plainly in Fig. 4, a fulcrum-point *w* is formed by the meeting of the front straight edge of the part *b* of the pin-head and the adjacent outer peripheral edge of said head. This fulcrum-point *w* when the pin-tongue is in its closed position, as shown in Fig. 7, bears against the exposed surface of the projection *f* of the base of the earpiece.

I provide the base of the earpiece or fixed hinged member of the joint with projections *f*, which serve as a bearing-plate to resist the thrust and wear of the fulcrum-point and which at the same time afford an increased base area for solder and constitute a stronger support for the joint.

An important feature of my improved pin-tongue is the massing of the metal in the flattened head into a position in front of the line *v v*, Fig. 4, which is a tangent to the pivot-hole *a* to form there a very strong and entirely rigid fulcrum-point.

The perfect closure along the line *c*, as seen in Fig. 4, together with the extra broadening of the parallel sides of the flattened head in front of the tangent line *v v* of the pivot-hole *a*, causes said head to be absolutely rigid and able to resist all strains exerted on the portion *b* of said head which are in a direction at a right angle to the inner end of the pin-stem A. All strains upon said flattened head exerted at right angles with the plane surfaces or sides thereof are resisted by the ears *d d'* of the joint when the parts are in the position shown in Fig. 11 and the pivot B is riveted in said position.

In my improved device the pivot B is loose in the pivot-hole *a* of the flattened pin-head, but tight in the ears, thus reducing to a minimum the wear upon the pivot. There is no opening or slot extending out from the pivot-hole; but along the line of closure *c*, Fig. 4, the flattened head is in solid abutment with the pin-stem and exactly conforms thereto, and so there is no spring function possible in said flattened head and no possibility of the accidental engagement of said head with the fabric into which the pin is thrust.

In my improved pin-tongue I get the full strength of the wire at the point marked *z* in Fig. 4.

The strain of the pressure of the fulcrum-point *w* on the bearing-plate *f* when the pin-stem A is sprung into engagement with the pin-catch D is received directly and positively on the inner end of the pin-stem at the place indicated by *y* in Fig. 4 and all along the contact-line marked *c* in said figure. Thus all strain upon the pin-stem A in closing and springing into engagement with the hook *q* of the catch D, as represented in Fig. 7, is forward of the point marked *y* in Fig. 4, where the pin-stem is of full size and cylindrical, there being no resiliency back of said point marked *y*.

I claim as a novel and useful invention and desire to secure by Letters Patent—

1. The improved pivot for a pin-joint herein described, consisting of the two cylindrical portions *m*, *m* having the same diameter, the central cylindrical portion *n* having a uniform diameter less than the diameter of the portions *m*, *m*, the shoulders *o*, *o*, between the portions *m*, *n*, *m*, and the conical ends *p*, *p*, extending from the portions *m*, *m* respectively, and all made of one piece of metal.

2. As a new article of manufacture, the pin-tongue herein described having a flattened head provided with a round pivot-hole, and a pivot ready mounted loosely in the pivot-hole and having a diameter such as to allow said pivot to slide closely through the pivot-hole, and also having a central circumferential groove wider than the thickness of said head of the pin-tongue and also provided with conical ends, said pivot being loosely engaged by gravity within said groove, substantially as shown.

3. As a new article of manufacture, the pin-tongue herein described, having a flattened head provided with a round pivot-hole, and a pivot ready mounted loosely in the pivot-hole having two cylindrical ends which are insertible through said pivot-hole with a close sliding fit and also having two annular shoulders and an intermediate central circumferential groove, said head of the pin-tongue being mounted loosely upon the grooved portion of the pivot in the pivot-hole with some portion of the edge of said pivot-hole engaged loosely in some portion of said groove.

4. As a new article of manufacture, the pin-tongue herein described, having a head with a pivot-hole therein, and a cylindrical pivot ready mounted in the pivot-hole and insertible through said pivot-hole with a close sliding fit and provided with conical ends and a central circumferential groove, said head being loosely mounted upon the grooved portion of the pivot.

5. The improved hinge-joint for brooches and similar articles herein described, consisting of the combination of a base-plate and two integral earpieces extending therefrom in

divergent angular positions, each earpiece having a tubular pivot-hole through it extending from the inner side half-way through it and a concentric conical-shaped hole continuous with the first-named hole and extending from the outer side of said earpiece, whose larger diameter is on the outer side of said earpiece.

6. The combination of a back plate, a hinge-joint comprising parallel ears each of which has a pivot-hole whose outer end is circumferentially flared to constitute a conical socket, a pin-tongue having a head with a circular hole through it, and a pivot loosely mounted in the pivot-hole of the head of the pin-tongue, the ends of which pivot are spread and riveted in the said conical sockets of the ears so that the riveted portions of said pivot are wholly contained in said sockets and are approximately flush with the outer surfaces of said ears respectively.

In testimony whereof I affix my signature in presence of two witnesses.

FRANK E. FARNHAM.

Witnesses:
WARREN R. PERCE,
KATIE GALLIGAN.