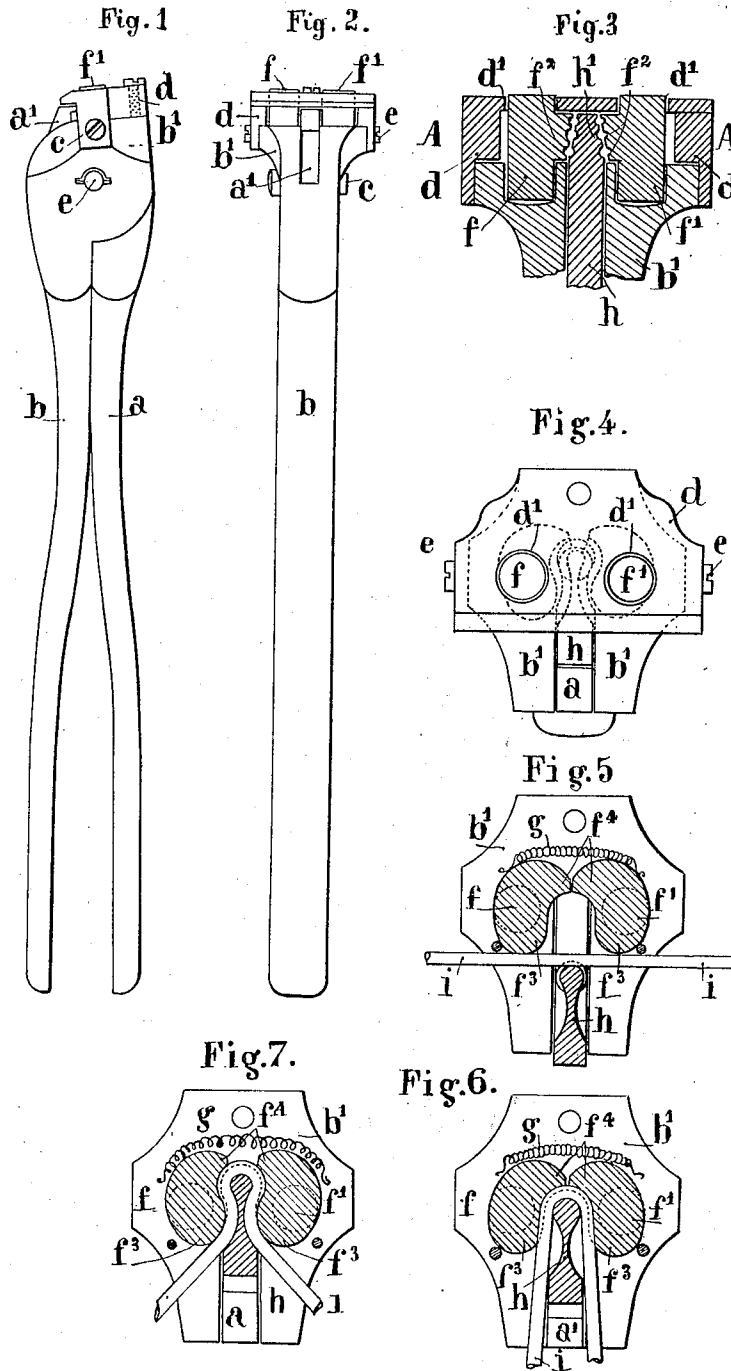


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NIPPERS FOR MAKING PIANO CHORD LOOPS FOR AEROPLANES.  
APPLICATION FILED JUNE 8, 1918.

1,330,229.

Patented Feb. 10, 1920.



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# UNITED STATES PATENT OFFICE.

FRANCIS ATHIMON, OF ST. MARS LA JAILLE, FRANCE.

NIPPERS FOR MAKING PIANO-CHORD LOOPS FOR AEROPLANES.

1,330,229.

Specification of Letters Patent.

Patented Feb. 10, 1920.

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*To all whom it may concern:*

Be it known that I, FRANCIS ATHIMON, citizen of the Republic of France, residing at St. Mars la Jaille, Seine-Inférieure, in the Republic of France, have invented new and useful Improvements in Nippers for Making Piano-Chord Loops for Aeroplanes, of which the following is a specification.

In aeroplanes, piano chord eyelets are the points of attachment whereby the shrouds are fixed to the studs upon which they exert a traction.

At the present time this eyelet or loop is obtained by means of ordinary round nippers. The operator begins by turning off a first elbow, then he winds the wire around one of the jaws end or beak of the nippers and he thus forms the second elbow. For thick chords, the eyelet cannot be made on the spot it must be made upon a firmly fixed mandrel, before it is fitted up.

In thus operating it is very difficult to get a perfect evenness in the form of the loops. This work requires great skill from the workman and causes a loss of time. Moreover for thick wires the loops of which cannot be made right off, it frequently occurs that the fitting up is laborious, as such loops are not always at the exact spot where they should be.

The nippers which form the object of this invention are intended to remedy such defects by securing the evenness of the loops with all kinds of wires of average or heavy cross section while sparing a good deal of time. Also, in the case of thick wires, the nippers enable the loops to be made in the spot, according to the fitter's requirements and hence with all necessary precision.

In the accompanying drawings:

Figure 1 is a front view of the nippers closed.

Fig. 2 is a side view;

Fig. 3 is a cross section on an enlarged scale showing the two nipper jaws;

Fig. 4 is a plan view.

Figs. 5, 6 and 7 are horizontal sections on line A—A of Fig. 3 and show the three formation stages of the loop.

As shown in the drawings, the nippers consist of two jaws *a* and *b* pivoted upon a pin or axis *c*; the upper part *a*<sup>1</sup> of the jaw *a*, enters a mortise formed in the upper part *b*<sup>1</sup> of the jaw *b*. A cap *d* provided in its upper wall with two circular openings *d*<sup>1</sup> is secured to the upper part *b*<sup>1</sup> of the jaw *b* by means

of screws *e*. The part *d* forms a housing for two pivotable cams *f* and *f*<sup>1</sup> of peculiar shape the lower ends of the axes of which rest in circular recesses formed in the part *b*<sup>1</sup> while their upper ends enter the openings *d*<sup>1</sup> of the part *d*.

The inner surfaces of the cams *f*, *f*<sup>1</sup> converge upwardly and semicircular grooves *f*<sup>2</sup> the diameter of which corresponds to different thicknesses of wire are formed in said inner surfaces; those having the smallest diameter are at the upper part whereas those with an average diameter are in the middle and those with the biggest diameter are at the base leaving thus between two similar semicircular grooves an annular space having a diameter proportionate to the thickness of the wire.

The horizontal cross sectional outlines *d* of the cams *f*, *f*<sup>1</sup> form in their front end two heel pieces *f*<sup>3</sup> the distance between which when at rest is equal to the outside diameter of the eyelet to be formed and at their opposite ends two beaks *f*<sup>4</sup> are in contact at their apices and are held in that position by a spiral spring *g*. The upper part of the jaw *a* is terminated by a mandrel or head *h* tapering upwardly which enters the space between the two cams *f*, *f*<sup>1</sup> when the nippers are closed. Said head is provided opposite the semicircular cam grooves *f*<sup>2</sup> with similar grooves *h*<sup>1</sup>.

The horizontal cross sectional outline of the mandrel *h* shows in front a half round part prolonged by a rectangular part the sides of which are curved inwardly, the whole of this arrangement gives the outline of the loop to be formed.

The formation of the eyelet or loop is carried on in the following manner:

The two nipper jaws are opened and the shroud wire *i* is placed in the groove *h*<sup>1</sup> of the mandrel *h* corresponding to its diameter so that this wire may be pinched between the half round head of the mandrel and the heel pieces *f*<sup>3</sup> of the cams *f*, *f*<sup>1</sup> as shown in Fig. 5; the points of contact of the heel pieces *f*<sup>3</sup> should be for this position of the jaws at a distance one from the other slightly greater than that between the center of the axes of the cams. By pressing the two nipper handles or jaws *a*, *b* in order to close them the mandrel *h* enters between the cams while pulling up the wire which enters the grooves *f*<sup>2</sup> of the said cams and is bent over so as to fit the head of the mandrel until it

comes to bear against the apices  $f^4$  of the cams (Fig. 6).

By continuing to squeeze the nipper handles or jaws in order to close them completely the mandrel continues to move forward between the cams and the wire  $i$  pushes the apices  $f^4$  which separate while causing the cams  $f^1$  to pivot upon their axes. This motion has for its effect to bring the heel pieces  $f^3$  close to one another so that they may exert a lateral pressure upon the two branches of the wire and cause them to assume the shape of the mandrel  $h$  (Fig. 7).

The eyelet or loop is thus completed, having been rapidly formed by a mere pressure on the nipper handles or jaws at a proper point of the wire without needing any other heavy or cumbersome tools.

When the wire is withdrawn from the nippers the cams are brought back into their initial position by the spiral spring  $g$ .

Having now described my invention, what I claim as new and desire to secure by Letters Patent is:

25 1. A wire nipper comprising in combination two members adapted to cross each other at a point intermediate of their length and comprising each a handle and a jaw, a fulcrum at said point, about which said members are adapted to pivot, a mandrel on one jaw provided with inwardly curved side faces, two cams pivoted on the other jaw and having rounded tails adapted to co-operate respectively with the curved side faces of the mandrel and noses adapted to come in contact one with the other and a spring tending to hold said cam noses in contact.

40 2. A wire nipper comprising in combination two members adapted to cross each other at a point intermediate of their length and comprising each a handle and a jaw, a fulcrum at said point about which said members are adapted to pivot, a mandrel on one jaw provided with inwardly curved side faces, two cams pivoted on the other jaw and having rounded tails adapted to co-operate respectively with the curved side faces of the mandrel and noses adapted to come in contact one with the other, a spring tending to hold said cam noses in contact, the acting surfaces of the mandrel and cams

converging upwardly and being provided with grooves having a semicircular cross section, the grooves having respectively different diameters which decrease progressively from one groove to the next in an upward direction.

3. A wire nipper comprising in combination two members adapted to cross each other at a point intermediate of their length and comprising each a handle and a jaw, a fulcrum at said point, about which said members are adapted to pivot, a mandrel on one jaw provided with inwardly curved side faces, two cams pivoted on the other jaw and having rounded tails adapted to co-operate respectively with the curved side faces of the mandrel and noses adapted to come in contact one with the other, a spring tending to hold said cam noses in contact, and a housing removably secured on the cam carrying jaw, the cams being provided at their upper and lower end with trunnions adapted to pivot in the jaw and the housing, respectively.

4. A wire nipper comprising in combination two members adapted to cross each other at a point intermediate of their length and comprising each a handle and a jaw, a fulcrum at said point, about which said members are adapted to pivot, a mandrel on one jaw provided with inwardly curved side faces, two cams pivoted on the other jaw and having rounded tails adapted to co-operate respectively with the curved side faces of the mandrel and noses adapted to come in contact one with the other, a spring tending to hold said cam noses in contact, and a housing removably secured on the cam carrying jaw, the cam being provided at their upper and lower ends with trunnions adapted to pivot in the jaw and the housing, respectively, the cam carrying jaw being provided with a mortise in which the mandrel carrying jaw is guided.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

FRANCIS ATHIMON.

Witnesses:

LOUIS MOSÈS,  
CHAS. P. PRESSLY.