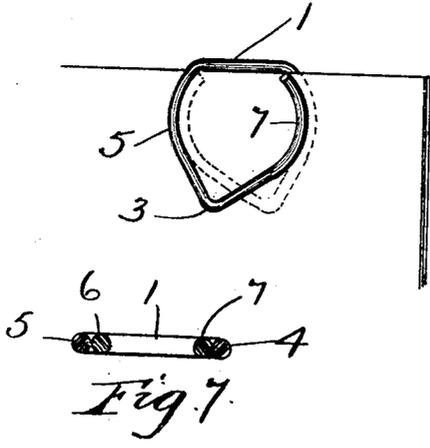
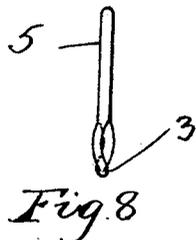
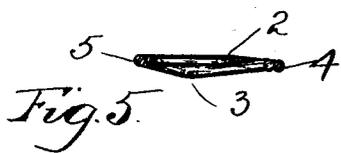
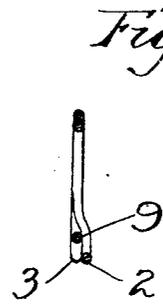
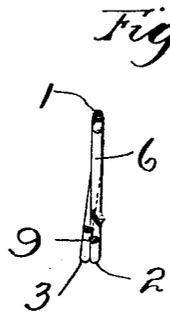
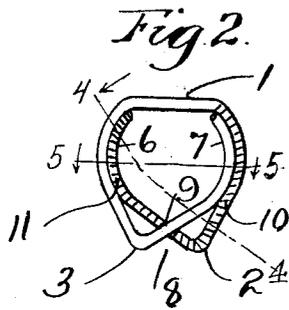
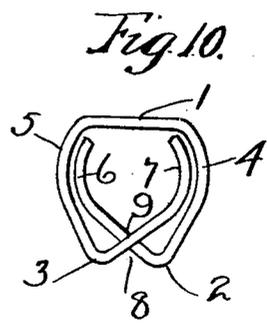
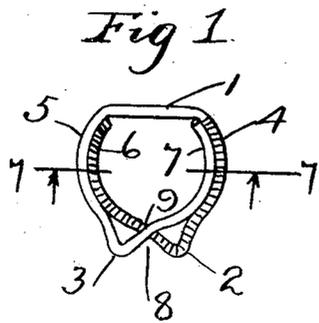
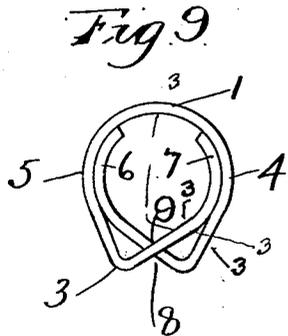


J. B. HALE.
SPRING CLIP.
APPLICATION FILED NOV. 25, 1904.



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334

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UNITED STATES PATENT OFFICE.

JOSHUA B. HALE, OF PROVIDENCE, RHODE ISLAND, ASSIGNOR, BY
MESNE ASSIGNMENTS, TO RING PAPER CLIP COMPANY, A COR-
PORATION OF RHODE ISLAND.

SPRING-CLIP.

No. 803,897.

Specification of Letters Patent.

Patented Nov. 7, 1905.

Application filed November 25, 1904. Serial No. 234,217.

To all whom it may concern:

Be it known that I, JOSHUA B. HALE, a resi-
dent of the city of Providence, in the county of
Providence and State of Rhode Island, have
5 invented certain new and useful Improvements
in Spring-Clips; and I do hereby declare that
the following is a full, clear, and exact descrip-
tion thereof, reference being had to the accom-
panying drawings, and to the numerals of
10 reference marked thereon, which form a part
of this specification.

This invention has for its object to provide
a novel, simple, and effective spring-clip made
of a single piece of suitable spring-wire and
15 one that may be very readily applied to a plu-
rality of sheets of paper or similar articles in
securing them together.

The most essential feature of this device is
its particular construction whereby a greatly
20 increased gripping power or force is obtained
over clips of other constructions using the
same size wire combined with convenience in
applying the clip to the package of papers or
the like.

This clip is constructed in a substantially
circular form, having practically two coils and
an angular projection from each coil to jointly
provide between them a mouth or space open-
ing outwardly from one side of the frame.
30 Instead of having the two coils superimposed
or laid side by side in a helical form the two
ends of the wire are carried across each other
approximately midway between the ends of
the said projections and then bent back and
35 laid within and adjacent to the outer circle
and in a plane with the same and also in a plane
with the bridge or saddle.

It is an obvious fact that by carrying the
ends of the coil across their adjacent projec-
40 tions and bending them back into the circle
in line with the outside coil a greatly increased
tension is produced on the engaging surfaces
of the wire, as more power is required to sepa-
rate the coils when set back in this manner
45 one within the other.

In the construction of this clip the wire is
first wound on an arbor in a helical form and
the bridge portion bent down to form a chord
of the circle. This bridge portion then natu-
50 rally stands at an angle to the axis of the circle,
said angle being due to the helical winding of
the wire; but when the power is applied to
set the coils one within the other this bridge

is at the same time bent back at right angles
to the axis of the clip, giving more set or twist 55
to the wire and, again, greatly increasing the
gripping force of the clip.

Although the coils are set one within the
other, it does not require the pressure of the
60 fingers to separate or open them, as the two
projections cross each other and form between
them a natural mouth, whereby it is only neces-
sary to press the clip onto the articles to
cause the coils to separate and allow the papers
to enter between said coils. 65

A further object of the invention is to knurl
or roughen the engaging surfaces of the wire
to assist in preventing the articles from slip-
ping from the grasp of the clip.

This clip has a very neat and attractive ap- 70
pearance, particularly when in position on the
papers, and on account of its construction it
looks the same on both the front and back of
the package. It is so formed as to remove
75 all danger of defacing, tearing, or abrading
the papers or articles to which it may be ap-
plied or of injuring the fingers in handling.
The liability of becoming snarled or tangled
together in groups when assembled in com-
80 mercial packages is entirely obviated.

With these and other objects in view the
invention consists of certain novel features of
construction, as will be more fully described
in this specification and particularly pointed
85 out in the appended claims.

The accompanying drawings illustrate the
preferred form of the invention with several
modifications of the same which might be
made without departing from the spirit or
90 scope of my invention.

Figure 1 is a plan view of the preferred
form of my invention. Fig. 2 shows a sub-
stantially circular clip having two projections,
one side of each projection being tangent to
the outside or circular portion of the clip. 95
Fig. 3 shows a sectional view taken on line
3 3 of Fig. 9, illustrating the ends of the coil
as set back within the circle and in line with
the outside coil. Fig. 4 illustrates a section
100 on line 4 4 of Fig. 2, showing the points or
projections offset sharply over each other,
bringing the ends of the wire back into the
circle flush with the outside coil. Fig. 5 rep-
resents a section on line 5 5 of Fig. 2 looking
105 in the direction of the arrows, showing the
offset projections. Fig. 6 shows my improved

clip engaging a package of papers. Fig. 7 is a sectional view on line 7 7 of Fig. 1 looking in the direction of the arrows, showing the position of one coil within the other. Fig. 8 represents an edge view of the clip, showing the points or ends of the projections as bent around each other and carried back in line or in the same plane with the body or frame of the clip. Fig. 9 shows a modification in which the saddle or back of the clip is carried completely around, forming an arc of a circle. Fig. 10 shows the same construction as that represented in Fig. 2, with the exception that a space is left between the ends and the outside walls of the circle.

This clip is preferably formed of wire of any desired size having sufficient temper to provide a spring element. It is preferably constructed in a substantially circular form, being first helically wound with practically two coils, and then the wire is cut, leaving a double frame or body portion, but single at its top or bridge at 1.

Each coil has an angular projection 2 and 3, which projections jointly provide between them a mouth or space 8, opening outwardly from one side of the frame. Instead of having two coils superimposed or laid side by side in helical form the two ends of the wire 6 and 7 are carried across each other at 9 approximately midway between the ends 2 and 3 of said projections. These ends 6 and 7 are laid within and preferably adjacent to the outer circle or sides of the frame 4 and 5 and in a plane with the sides of said frame and also in a plane with the bridge or saddle. It is found in practice that the ends thus disposed one within the other greatly increase the gripping power of the clip and make possible the use of much smaller wire proportionally to produce the same gripping effect of other clips, thereby considerably reducing the weight and cost of the stock. The cost of the wire being the greatest item in the manufacture of this clip, the reduction in the cost of the same materially reduces the cost of production.

A ready entrance between the two coils of wire is produced by crossing the wire near its points, thereby obviating the necessity of using the fingers to depress one of the coils in order to admit the article between them.

The saddle-piece of the clip may be formed, if desired, on an arc of a circle, as shown in Fig. 9, thus providing a long spring element which may be more particularly used for retaining thick packages; but for ordinary use I preferably construct the clip with the rounded back bent downward, forming a straight saddle as a chord of the circle, (shown at 1 in Fig. 2,) thereby making the clip much stiffer and less resilient, as when the saddle is straight the wire springs or twists only between the bends at the ends, the shorter the saddle the stiffer and more binding the grip.

Another feature in the construction of this clip is that the extent of the open space between the points may be controlled by regulating the length of this saddle or by regulating the tension of the wire while being wound on its arbor.

The construction represented in Fig. 8 shows the points or ends of the projections bent around each other and carried back in a line or plane with the frame of the clip. This is not the preferred form, but may be so constructed, if desired.

In Figs. 1 and 2 is shown a feature of adapting the clip for still greater efficiency by knurling or scoring the portions 10 and 11 of the wire that engage the articles. While a clip may be made of sufficient torsional strength to hold the mass of papers together quite firmly, I have found in practice that if the engaging portions of the wire are left smooth the outside sheets are sometimes liable to slip out more easily than the interior ones. When the wire is knurled, as shown, the outside sheets are held more firmly, and it is impossible to displace them in ordinary handling.

I do not in this application claim, broadly, a paper-clip formed of a single piece of wire coiled upon itself to form a plurality of clamping members, each of said members having a projection, each projection and the end of the wire nearest to said projection as measured along the wire lying on opposite sides, respectively, of a diametrical plane bisecting the distance between the free ends of the wire, as this broad invention is covered by my co-pending application, Serial No. 228,751, filed October 17, 1904.

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

1. A paper-clip formed of a single piece of wire bent to form a plurality of clamping members, each of said members having a projection, each projection and the end of the wire nearest to said projection as measured along the wire, lying on opposite sides, respectively, of a diametrical plane bisecting the distance between the free ends of the wire, said free ends terminating inside of the frame.

2. A paper-clip formed of a single piece of wire coiled in a substantially circular shape and forming a plurality of clamping members, each of said members having a projection, each projection and the end of the wire nearest to said projection as measured along the wire, lying on opposite sides, respectively, of a diametrical plane bisecting the distance between the free ends of the wire, said free ends terminating inside of the coil.

3. A paper-clip formed of a single piece of wire bent to form a frame with a plurality of clamping members, each of said members having a projection, each projection and the end of the wire nearest to said projection as

measured along the wire, lying on opposite sides, respectively, of a diametrical plane bisecting the distance between the free ends of the wire, said free ends terminating inside of the frame, said clamping members being connected by a chordal bridge forming a stiffening saddle-piece.

4. A paper-clip formed of a single piece of wire coiled in a substantially circular shape and forming a plurality of clamping members, each of said members having a projection, each projection and the end of the wire nearest to said projection as measured along the wire, lying on opposite sides, respectively, of a diametrical plane bisecting the distance between the free ends of the wire, said free ends terminating inside of the coil, said clamping members being connected by a chordal bridge forming a stiffening saddle-piece.

5. A paper-clip formed of a single piece of wire bent to form a plurality of clamping members, each of said members having a projection, each projection and the end of the wire nearest to said projection as measured along the wire, lying on opposite sides, respectively, of a diametrical plane bisecting

the distance between the free ends of the wire, said free ends terminating inside of the frame, said clamping members being each provided with an irregular or roughened engaging surface.

6. A paper-clip formed of a single piece of wire bent to form a plurality of clamping members, each of said members having a projection, each projection and the end of the wire nearest to said projection as measured along the wire, lying on opposite sides, respectively, of a diametrical plane bisecting the distance between the free ends of the wire, said free ends terminating inside of the frame, said clamping members being connected by a chordal bridge forming a stiffening saddle-piece, said clamping members being also each provided with an irregular or roughened engaging surface.

In testimony whereof I have hereunto set my hand.

JOSHUA B. HALE.

In presence of—
FRANK A. FOSTER,
E. I. OGDEN.