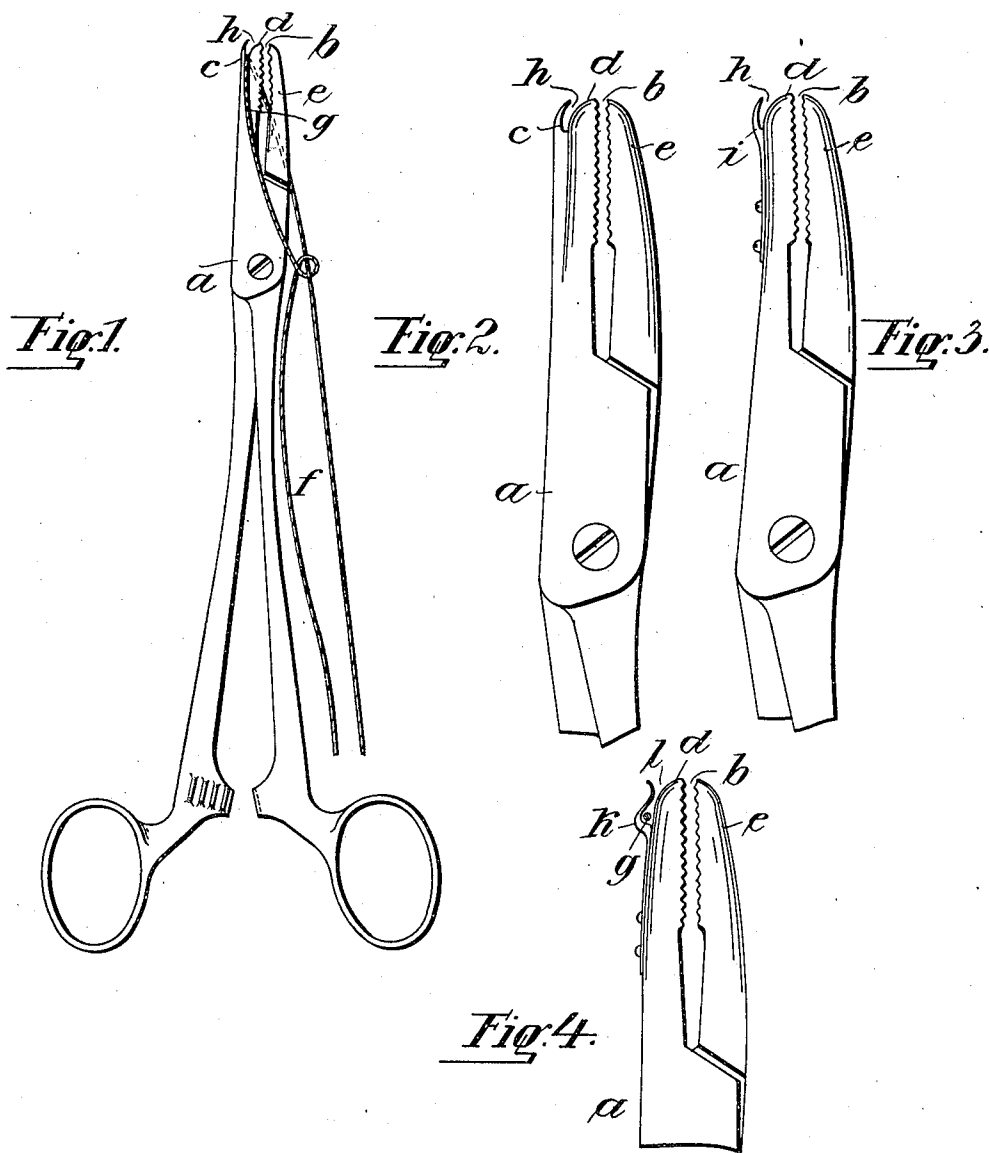


No. 825,121.

PATENTED JULY 3, 1906.

A. W. FRENTZEN & J. SCHOEMAKER.
MEANS FOR TYING BLOOD VESSELS.

APPLICATION FILED SEPT. 3, 1904.



WITNESSES

W. M. Avery

S. H. Cobb

INVENTORS

Albertus W. Frentzen
Jan Schoemaker

BY

Wm. M. Avery

ATTORNEYS.

UNITED STATES PATENT OFFICE.

ALBERTUS W. FRENTZEN AND JAN SCHOEMAKER, OF LEYDEN,
NETHERLANDS.

MEANS FOR TYING BLOOD-VESSELS.

No. 825,121.

Specification of Letters Patent.

Patented July 3, 1906.

Application filed September 3, 1904. Serial No. 223,253.

To all whom it may concern:

Be it known that we, ALBERTUS WILLEM FRENTZEN and JAN SCHOEMAKER, subjects of the Queen of the Netherlands, residing at Leyden, in the Netherlands, have invented certain new and useful Improvements in Means for Tying Blood-Vessels; and we do 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, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to an improved means for tying blood-vessels.

The binding of a blood-vessel has hitherto been effected by gripping the latter with a clip, nippers, or the like and thereupon placing a thread round the vessel and forming a loop, which is drawn tight. This method was inconvenient and unsuitable, since the clip or nippers interfered with the placing in position of the thread and the formation and fastening of the loop. According to our improved method this disadvantage is obviated by forming the loop separately and thereupon placing on the nippers with which the vein is gripped, the ends of the thread being then pulled to close the loop. The loop slides along the nippers toward the rounded end of the latter, by which the vein is held. Upon reaching the said end the loop slides onto the vein and is then drawn tightly together. To prevent the loop from assuming an unfavorable position on the nippers, the latter are preferably provided with an abutment in the form of a finger, spring, or the like which prevents the loop from changing its position on the instrument.

In the annexed drawings, Figure 1 is a plan view of the improved forceps. Fig. 2 is an enlarged detail view of the jaws thereof. Fig. 3 is a similar view in which the finger forms a part of a flat spring attached to one of the jaws, and Fig. 4 is a similar view in which the finger is provided with a recess for receiving the loop.

These nippers are in the form of a pair of shears *a* with serrated or ribbed jaws *b* and a finger-like projection *c*, which may be integral with one of the jaws. The ends *d* and *e*

of the jaws are rounded. When the instrument is to be used, it is held with its jaws pointing upward, and a loop *g*, formed of a thread or ligature *f*, is slipped onto the jaws in the manner shown in Fig. 1, so that the loop rests in the recess *h* between the finger *c* and one of the jaws. Pull exerted on the ends of the thread *f* will then cause the loop to slide from the nippers onto the vein gripped by them.

Fig. 3 illustrates a similar form of construction in which the finger described forms part of a flat spring *i*, attached to the nippers by means of small screws or the like. The looped part of the thread for binding the vein is placed on this finger, and the loop is then slightly pulled, so that it is lightly gripped between the spring *i* and one jaw of the nippers, the thread being thus held sufficiently securely to the instrument.

The form of construction shown in Fig. 4 differs from that shown in Fig. 3 by the fact that the finger is outwardly bent at *k*, so that a hollow space affording sufficient room for the loop is formed between the finger and the nippers.

It will be seen that it is sufficient to provide one jaw of the nippers with a finger *c*; but each of the jaws can be provided with a finger, the loop being placed on the instrument in such a manner that both fingers grip it.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is—

1. Forceps comprising jaws, and a spring-finger projecting from one of the jaws adjacent to its end.

2. Forceps, comprising a pair of jaws having rounded tips from one of which latter there projects a forwardly-projecting finger reaching substantially to the end of the jaw and following a curve which deviates but slightly from that of the jaw, whereby a long narrow slot is presented to receive the ligature, substantially as described.

In testimony whereof we have signed this specification in the presence of two witnesses

A. W. FRENTZEN.
J. SCHOEMAKER.

Witnesses:

I. I. HELSDON RIX,
W. MACKAY.