April 1, 1930. G. M. SACERDOTE 1,753,094

PAPER CLIP

Filed Dec. 27, 1927

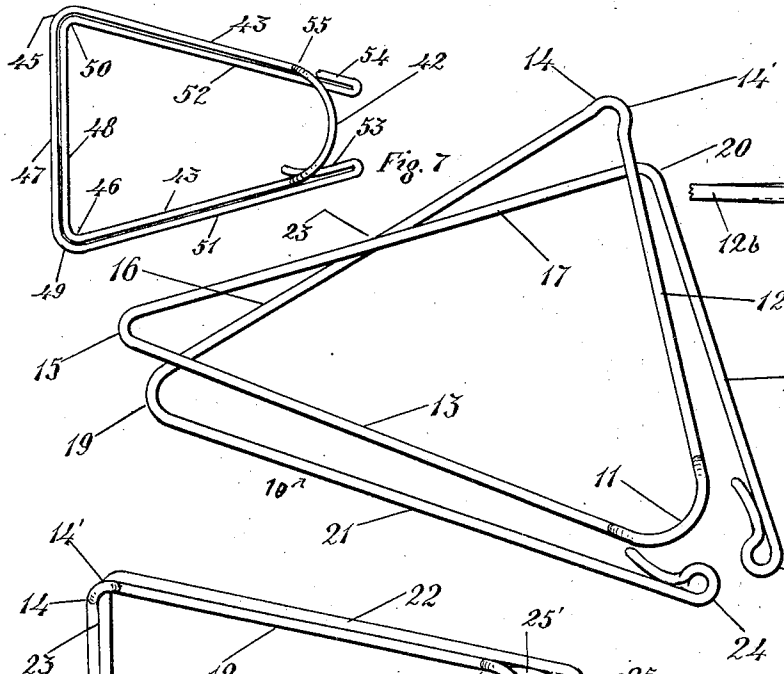


Fig. 7

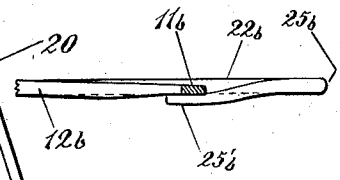


Fig. 9

Fig. 1

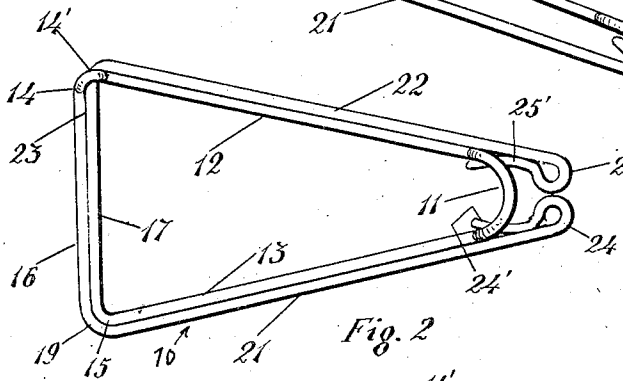
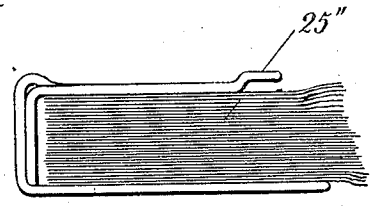


Fig. 2



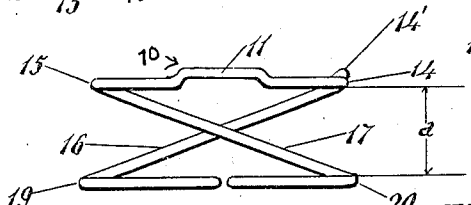


Fig. 4

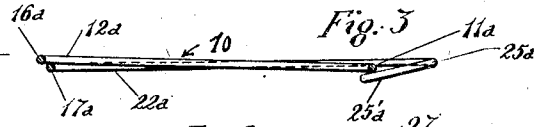
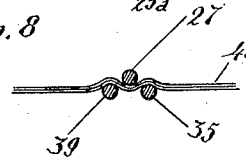


Fig. 3

Fig. 8



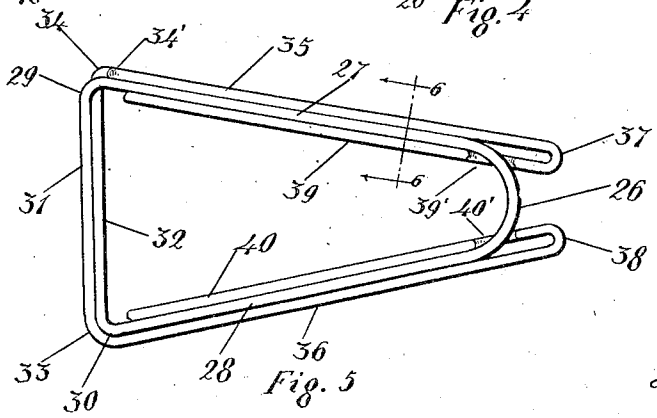


Fig. 5

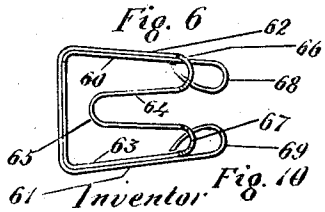


Fig. 6

Fig. 10

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UNITED STATES PATENT OFFICE

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PAPER CLIP

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This invention relates to that class of devices commonly known as paper clips, used for temporarily connecting together a number of loose sheets of paper such as letters, clippings, and so forth.

The primary object of this invention is to provide a paper clip of a novel and improved design, having a relatively large capacity, being adapted to effectively hold together a considerable number of sheets.

Another object of the invention is to provide a paper clip adapted both to effectively hold together a considerable number of sheets and to act quite effectively in the same capacity when only a few sheets are concerned.

A further object is to provide a paper clip adapted to be used for all ordinary purposes and also adapted to hold together a considerable number of sheets, which may be made out of metallic wire at very moderate cost.

Other objects and advantages of the present invention will more fully appear as the description proceeds and will be set forth and claimed in the appended claims.

Paper clips of the types now generally in use are not as effective in clamping a relatively large number of sheets as in clamping only two or three sheets, because their clamping members can only be spread apart a limited angle, beyond which the limit of elasticity of the material is exceeded and a tendency in the clip to slip out develops. Special clips have been designed having a comparatively large capacity, but owing to their dimensions and cost, these clips are only suitable for desk use and not for general purposes.

The device forming the object of this invention is no more expensive than ordinary wire clips which it can fully replace in order to hold together limited thicknesses of paper for mailing purposes, etc. At the same time the device is free from the limitations of ordinary clips and can be used quite as effectively in holding together relatively large numbers of sheets, the combined thickness of which is quite beyond the capacity of clips of ordinary design.

The device is illustrated in the annexed drawings in which:

Fig. 1 is a view in perspective of a clip made according to my invention with its prongs slightly spread apart;

Fig. 2 is a plan view of a similar clip in its normally closed position;

Fig. 3 is a side view in elevation of the clip as applied to hold together a large number of sheets;

Fig. 4 is a front view in elevation of said clip spread to the position of Fig. 3, with the sheets removed;

Fig. 5 is a plan view of another clip of a somewhat different design;

Fig. 6 is a detail cross sectional view on an enlarged scale, through line 6—6 of Fig. 5, showing a few sheets of paper clamped by the clip;

Fig. 7 is a plan view of a clip, of a slightly modified construction also embodying my invention;

Fig. 8 is a side sectional view in elevation of a clip, the construction of which is a modification of that illustrated in Fig. 2;

Fig. 9 is a fragmentary side sectional view in elevation on an enlarged scale of the outer portion of a clip of the type shown in Fig. 8, having its end abutting portions flattened out; and

Fig. 10 is a plan view of a clip somewhat similar to that shown in Fig. 7 with an added feature which may be applied in connection with all the clips shown.

I have found that clips comprising two clamping members adapted to remain substantially parallel to each other when spread apart are not as a rule very effective in holding together a limited number of sheets, when the two frames remain superimposed to each other in their contracted position. This is presumably due to the limited pressure developed by the clamping members under these conditions, and consequent limited frictional hold upon the sheets.

One of the outstanding features of the clip illustrated in a special arrangement of two frames adapted to remain substantially parallel to each other when spread apart, and adapted to remain substantially in the same plane when contracted; so that if only a few sheets are clamped together the same become

wedged between adjoining legs or sides of the frames, the clamping action of which is thereby rendered more effective.

By referring to the drawings, Figs. 1 to 4, it will be clearly seen that the clip 10, is formed of a single piece of wire bent in the middle at 11, so as to have its legs 12, 13, diverging; at points 14, 15, equidistant from point 11, said legs are then bent inwardly so as to be close to each other and so as to point in opposite directions, forming tracts 16, 17 respectively, constituting the outer and inner members of the base or head of the clip.

Said two tracts are then once more bent at points 19, 20, close and externally to points 15, 14 to form fingers or prongs 21, 22, directed towards the apex 11, running side by side with and externally to legs 13, 12, respectively. Tracts 16, 17, cross each other at 23, tract 17 passing under the inner end of leg 12 before it is bent at 20 to form finger 22. However, said inner end of leg 12 is raised over tract 17, as shown at 14', so as to leave the leg proper at the level of finger 22; so that, normally, fingers 21, 22, leg 13, and practically all of leg 12, are in the same plane, fingers 21, 22 abutting against legs 13, 12, respectively.

The tips of fingers or prongs 21, 22, are preferably rounded in the shape of eyelets as at 24, 25, in order to avoid any sharp edges, and the lengths of said fingers or prongs are preferably made longer than that of legs 12, 13. Furthermore, the free ends of the wire after forming said eyelet portions are directed inwardly, underneath and slightly beyond bent portion 11, the end 24', 25', being on a level with fingers 21, 22.

Bent portion 11 therefore, overlapping said ends 24', 25', is slightly off-set outwardly in relation to the plane of fingers 21, 22, as shown in Figs. 2, 3, and 4. By thus extending tip ends 24', 25' inwardly and underneath contact portion 11, the danger of the clip being spread in the wrong direction with relation to raised portion 14' is avoided, and the user is not left in doubt as to which is the underside and which the upper side of the clip.

A clip has thus been obtained in the finished form as shown in Fig. 2, where legs 12, 13 bent at 11 form one of the clamping members and fingers or prongs 21, 22, form the other, base members 16, 17, forming an extensible spring connection between said clamping members. Said clamping members as explained, are one shorter than the other and this greatly faciltates their being spread apart by holding the one and forcing away the other, in order to insert the sheets to be clamped therebetween.

When this is done it may be observed that the clip may be forced all the way in, over these sheets because the crossing of base members 16, 17 permits of their assuming various inclinations in relation to each other about their intermediate point 23.

The device consists therefore in, the combination of two triangular elements one of which is composed of element 12, base member 16 and finger or prong 21, and the other one of which is formed by element 13, base member 17, and finger or prong 22, base members 16, 17, crossing each other. Considering these two triangular elements separately from each other, it is seen that when a certain number of sheets are inserted between element 12 and finger or prong 21, element 12 is forced upwardly while finger or prong 21 is forced downwardly and a tendency is created in base member 16 to move about point 23 in a crosswise direction.

In a similar manner the same thickness of paper inserted between element 13, and finger or prong 22 forces element 13 upwardly and finger or prong 22 downwardly causing a tendency in base member 17 to rotate about point 23 in a counter crosswise direction. The combined action is therefore to force elements 12, 13 forming the upper clamping member away from fingers or prongs 21, 22, forming the lower clamping member.

It is obvious that since legs 12, 13 and fingers 22, 21, are normally in the same plane and close to each other respectively, and tend to return to said position at all times, they will also effectively hold together even only two or three sheets of very fine paper due to the pinching action developing between the adjoining sides of said legs and fingers.

In this respect their action is quite comparable to that of the ordinary clips now in general use. If the lower and upper clamping members of which the clip is composed were normally in a superimposed relation to each other, as stated, the resulting structure would be quite ineffective in the ordinary case when only two or three sheets are to be attached to one another; because the action would be limited to a slight pressure exerted upon the surface of the sheets, said pressure being limited to one or two points where the clamping members abut against each other and being sometimes totally lacking. No pinching action causing partial bending and wedging in of the paper between the adjoining legs and fingers of the clamping members would take place.

In Fig. 5, I illustrate a slightly modified construction of clip which may be preferable in certain cases especially when the size and capacity of the clip are fairly large.

Like in the previous case, a considerable length of metallic wire, preferably steel, is bent at an angle at its middle point 26 to form the upper clamping member comprising side elements 27, 28. These side elements are then bent at points 29, 30, so as to be abutting against each other and directed in opposite directions to form the outer and inner base

members 31, 32, respectively. These are again bent at points 33, 34, close and externally to points 29, 30 to produce the fingers or prongs of the lower clamping member extending towards the apex 26, the base members being also in this case caused to cross each other.

The difference between the present structure and the one previously described, is that the fingers or prongs constituting the lower clamping member are composed of outer legs 35, 36, bent in the form of an inverted U at points 37, 38, beyond apex 26 to form inner legs 39, 40. The outer and inner legs of each finger, or prong are preferably adjacent and symmetrically arranged in relation to the corresponding side members 27 or 28 of the upper clamping member, so as to actually be external and internal respectively in relation to said side elements with reference to the plan illustration of the clip.

Outer leg 36 is flush with side element 28 and outer leg 35 is raised at its inner end as indicated at 34' so that it is flush with side element 27, practically for its entire length. The inner legs 39, 40, are also flush with side elements 27, 28, respectively, but since they cross the curved portion 26 of the clip, they are depressed at the point of crossing as indicated at 39', 40', so as to pass underneath said portion 26 at said points; otherwise they are in the same plane with elements 27, 28 and outer legs 35, 36, practically along their entire length.

Also in this case, the lower clamping member is preferably longer than the upper member so as to facilitate the spreading of one away from the other. The advantage resulting from this construction is that the clamping action is somewhat more secure owing to the fact that the pinching action due to the pressure exerted by elements 27, 28 centrally of and opposite to the pressure exerted by legs 35—39, 36—40, respectively, results in a greater frictional hold on the papers clamped thereby.

This action is illustrated on an enlarged scale in Fig. 6, where 41 designates the thickness of the papers clamped between lower element 27 and the legs 35—39 of the corresponding upper finger or prong.

In Fig. 7, I illustrate still another modified construction of clip where the two base members do not cross one another when the clip is in its flat or normal condition.

In this form of invention, a single length of metallic wire, preferably steel is bent at an angle at its middle point 42 to form the upper clamping member comprising side elements 43, 44. These side elements are then bent at points 45, 46, so as to be abutting against each other and directed in opposite directions to form the outer and inner base members 47, 48, respectively.

These are again bent close to bends 46, 45, externally and internally thereof, respectively, as shown at 49, 50, forming the fingers or prongs 51, 52 of the lower clamping member extending towards and beyond apex 42. Said fingers or prongs have their free ends bent inwardly as shown at 53, 54.

Finger or prong 52 passes underneath bent portion 42 at one side of the clipping and bent portion 53 of finger or prong 51 also passes underneath bent portion 42 at the other side; and in order to maintain said parts 52, 53, in the same plane with fingers 43, 44, 51, bent portion 42 and the upper clamping member is off-set as shown at 55 in a manner similar to that described in connection with bent portion 11 of the clip shown in Figs. 1 to 4.

This construction of clip is somewhat simpler than that of the clips previously described because it does not require the formation of a raised portion such as 14' in the body of the clip, but only requires either offsetting of part 42 or else embossing or offsetting of parts 52, 53, where they cross said part 42. It is also possible to altogether avoid the necessity of making sharp bends in the wire simply by causing the planes of the two frames to overlap or cross one another without coinciding with each other.

For instance, in Fig. 8 representing a clip having a general appearance of the one shown in Fig. 2, it will be observed that the leg 12^a, of the inner frame is inclined downwardly from the base towards the outer end of the clip, crossing the plane of leg 22^a of the other frame, the tip end $25'^a$, being depressed so as to permit apex 11^a to pass beyond the upper surface of leg 22^a.

In this manner, all sharp bends are avoided and the pinching action exerted by the two frames is still available in spite of the fact that the frames are not strictly in the same plane.

When such a construction is adopted, it is preferable to flatten the abutting end portions of the outer and inner legs in order to decrease the thickness of the device as a whole. Such a construction is illustrated in Fig. 9 where the apex portion 11^b of frame 12^b is flattened and where also the tip of end portion $25'^b$ resting against 11^b, is flattened out in a similar manner, so as to decrease the total thickness of the device at such point.

It will be observed that my device substantially comprises an open and a closed clamping frame of which one is preferably longer than the other. I have found that the operation of the device is greatly facilitated if the shorter frame of the two is the closed frame as the drawings show, because the closed end of said shorter frame affords a convenient means for the tip of the finger of the operator to spread the two frames apart, while the projecting end of the longer frame is inserted underneath the batch of sheets to be clamped.

However, in inserting the device in posi-

tion, it is desirable to hold the finger tip so that it will not project beyond the outer end of the closed frame, so as not to interfere with the edges of the sheets to be clamped; therefore, I prefer to provide one of the frames with a finger tip rest at a point intermediate of its ends, for instance by forming the outer end of the closed frame with an inwardly projecting portion or finger, affording means for applying the finger tip of the operator to spread the two frames apart, at a point inwardly spaced from the outer end proper of said closed frame.

This feature is illustrated in Fig. 10 where 60 and 61 are the sides or legs of the open frame, and 62, 63, are the sides or legs of the closed frame, said closed frame being shorter than the open frame.

As shown in the drawing, the outer end of sides or legs 62, 63, are joined by a tract 64 which is bent to form a rearwardly directed finger 65 projecting within the frame, forming also two end fingers 66, 67.

In applying the device in position the two outer ends 68, 69, of the open frame are inserted underneath the batch of sheets to be clamped, and then pressure is applied against finger 65 to spread the two frames outwardly to a sufficient extent to permit the insertion of the clip over the thickness of the paper. In doing so the finger tip of the operator is applied against finger 65 at a distance from the outer ends of fingers 66, 67, preventing the possibility of interference between said finger tip and the edges of the sheets onto which the device is to be applied.

This feature may be applied in the form shown or in a modified form, in connection with all the types of clips described and constitutes an added improvement thereto.

From the foregoing it is seen that I provide a paper clip built along novel lines which permits of greatly enlarging the scope of usefulness of this class of devices. Broadly, the clip is composed of two frames, the sides of which are laterally displaced but preferably adjoining substantially in the same plane, so as to permit their crossing or overlapping each other, transversely of the plane of the device.

My invention may be carried into practice in ways different from those shown without departing from the inventive idea; for instance, it is obvious that the device need not necessarily be triangular in shape as the drawings show but may be made in any suitable or convenient outline; therefore, I reserve for myself the right to apply the same in any way or manner which may enter fairly into the scope of the appended claims.

I claim:

1. A device of the class described, formed from a single piece of metallic wire bent to form two clamping members and an extensible head composed of two members, each connecting one of the sides of one of said clamping members to the opposite side of the other, the sides of each clamping member being in close proximity with corresponding sides of the other, at least part of the clamping portion of one of said clamping members being within the plane of the clamping portion of the other.

2. A device of the class described, formed from a single piece of metallic wire bent to form two clamping members and an extensible head composed of two members, each connecting one of the sides of one of said clamping members to the opposite side of the other, the clamping portion of one of said clamping members being narrower than the clamping portion of the other, the sides of each clamping member being in close proximity of and substantially in the same plane with corresponding sides of the other, so as to permit each of said clamping members to overlap the other in the sense of their clamping action.

3. A device of the class described, formed from a single piece of metallic wire bent to form two clamping members and an extensible head composed of two members, each connecting one of the sides of one of said clamping members to the opposite side of the other, the sides of each clamping member being laterally displaced from and substantially in the same plane with corresponding sides of the other, so as to permit each of said clamping members to overlap the other in the sense of their clamping action, said clamping members being movable away from each other in one direction only, and blocking each other in the opposite direction.

4. A device of the class described, formed from a single piece of metallic wire bent to form two clamping members and an extensible head composed of two members, each connecting one of the sides of one of said clamping members to the opposite side of the other, the sides of each clamping member being laterally displaced from and in the same plane with corresponding sides of the other, one of said clamping members being longer than and having portions crossing the other, permitting movement of said clamping members away from each other in one direction, and blocking it in the other direction.

5. A device of the class described, formed from a single piece of metallic wire bent to form two clamping members and an extensible head composed of two members, each connecting one of the sides of one of said clamping members to the opposite side of the other, the clamping portions of said clamping members normally being and tending to remain in the same plane.

6. A device of the class described, formed from a single piece of metallic wire bent to form two clamping members and an exten-

sible head composed of two members crossing each other when the device is expanded and each connecting one of the sides of one of said clamping members to the opposite side of the other, the clamping portions of said clamping members normally being and tending to remain in the same plane.

7. A device of the class described, formed from a single piece of metallic wire bent to form two clamping members, the clamping portions of said clamping members normally being and tending to remain in the same plane, and an extensible head connecting each of the sides of one of said two members, to the opposite side of the other, one of said clamping members being longer than the other.

8. A device of the class described, formed from a single piece of metallic wire bent to form two clamping members, each one of said clamping members having converging sides the clamping portion of one member normally being in the same plane with the clamping portion of the other, and an extensible head composed of two members crossing each other when the device is expanded, and each connecting one of the sides of one of said clamping members to the opposite side of the other.

9. A device of the class described, formed from a single piece of metallic wire bent to form two frames and an extensible head composed of two members, each connecting one of the sides of one of said frames to the opposite side of the other, the sides of said frames running substantially parallel close to one another, said frames crossing each other at certain points and being bent at such points so as to permit the major portions thereof to normally remain substantially in the same plane.

10. A device of the class described, formed from a single piece of metallic wire bent to form two frames and an extensible head composed of two members, each connecting one of the sides of one of said frames to the opposite side of the other, said frames crossing each other at certain points, portions of one of said frames being bent at the points where they cross portions of the other so as to permit the major portions of said frames to normally remain substantially in the same plane.

11. A device of the class described, formed from a single piece of metallic wire bent to form two frames and an extensible head composed of two members, each connecting one of the sides of one of said frames to the opposite side of the other, the sides of said frames running substantially parallel close to one another, said frames crossing each other at certain points and being bent at such points, so as to permit the major portions thereof to normally remain substantially in the same plane, one of said frames being longer than the other.

12. A device of the class described, formed from a single piece of metallic wire bent to form two clamping members, the clamping portions of said clamping members normally being and tending to remain in the same plane, and an extensible head connecting said two members, one of said clamping members being longer than and having portions crossing the outer end of the other, said portions permitting movement of said clamping members away from each other in one direction, and blocking it in the other direction.

13. A device of the class described, formed from a single piece of metallic wire bent to form two frames and an extensible head composed of two members, each connecting one of the sides of one of said frames to the opposite side of the other, the sides of said frames running substantially parallel close to one another, said frames crossing each other at certain points and being bent at such points, so as to permit the major portions thereof to normally remain substantially in the same plane, one of said frames being longer than and having portions crossing the outer end of the other, said portions permitting movement of said clamping frames away from each other in one direction, and blocking it in the other direction.

14. A device of the class described, formed from a single piece of metallic wire bent to form open and closed clamping members, and an extensible head composed of two members each connecting one of the sides of one of said clamping members to the opposite side of the other, the sides of each clamping member being laterally displaced from the sides of the other, to permit each of said clamping members to overlap the other in the sense of their clamping action, said clamping members being movable away from each other in one direction only and blocking each other in the opposite direction, said open clamping member being longer than said closed clamping member.

15. A device of the class described, formed from a single piece of metallic wire bent to form open and closed clamping members, and an extensible head composed of two members each connecting one of the sides of one of said clamping members to the opposite side of the other, the sides of each clamping member being laterally displaced from the sides of the other, to permit each of said clamping members to overlap the other in the sense of their clamping action, said clamping members being movable away from each other in one direction only and blocking each other in the opposite direction, said open clamping member being longer than said closed clamping member, said closed clamping member having its outer end formed with a rearwardly projecting portion providing a finger tip rest.

16. A device of the class described, formed

from a single piece of metallic wire bent to form open and closed clamping members, and an expansible head composed of two members crossing each other and each connecting one of the sides of one of said clamping members to the opposite side of the other, said closed clamping member having its free end formed with a rearwardly extending portion providing a finger tip rest.

17. A device of the class described, formed from a single piece of metallic wire bent to form open and closed clamping members, and an expansible head composed of two members crossing each other and each connecting one of the sides of one of said clamping members to the opposite side of the other, said closed clamping member having its free end formed with a rearwardly extending portion providing a finger tip rest, said open clamping member being longer than said closed clamping member.

18. A device of the class described formed from a single piece of metallic wire bent to form two clamping members and an expansible head disposed at one end of said device and composed of two members crossing each other and each connecting one of the sides of one of said clamping members to the opposite side of the other, one of said clamping members being provided with a finger tip rest at a point intermediate its ends, the clamping members at the other end of said device having portions crossing each other whereby to prevent movement of said clamping members away from each other in one direction and permitting said clamping members to be moved away from each other in the opposite direction.

19. A device of the class described, comprising a clamping portion formed from a single piece of metallic wire bent to form open and closed clamping members, and an expansible head composed of two members crossing each other and each connecting one of the sides of one of said clamping members to the opposite side of the other, said open clamping member being longer than said closed clamping member, said closed clamping member being provided with a finger tip rest at a point intermediate its ends.

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