

Oct. 8, 1963

K. REINER
CLAMPS

3,106,214

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3 Sheets-Sheet 1

FIG. 1.

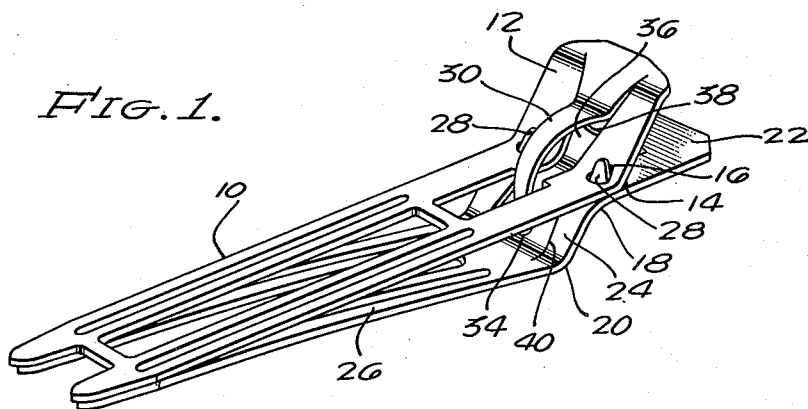


FIG. 2.

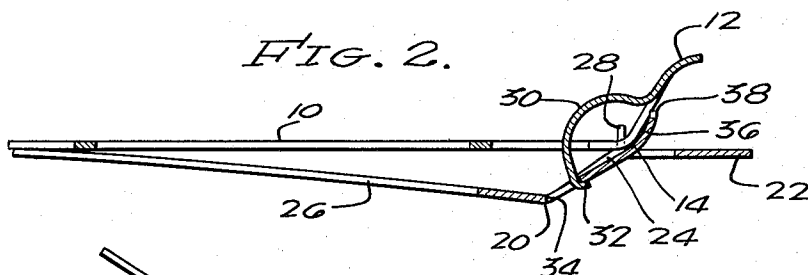


FIG. 3.

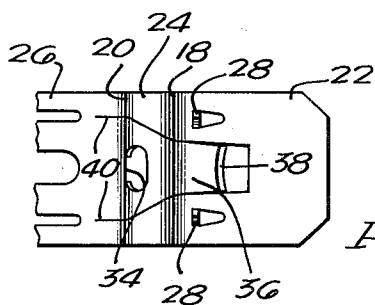
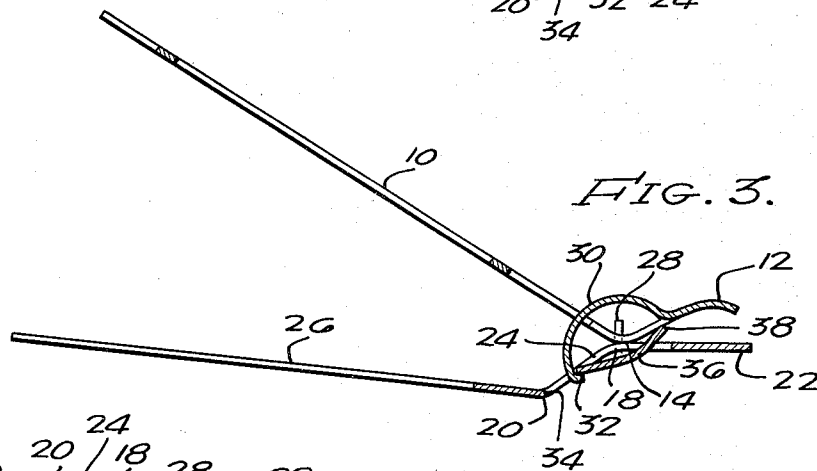


FIG. 4.

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3,106,214

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3 Sheets-Sheet 2

FIG. 5.

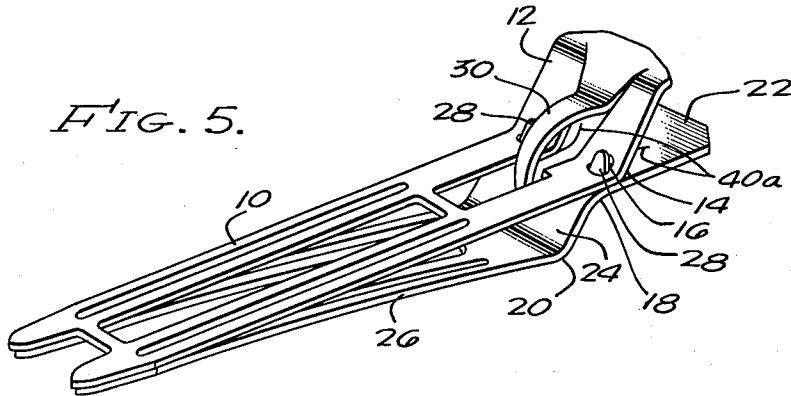


FIG. 6.

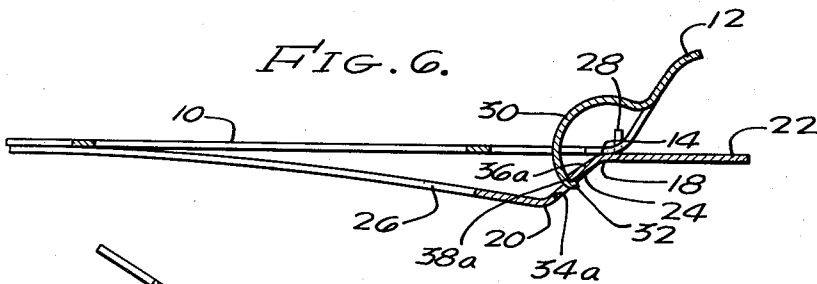


FIG. 7.

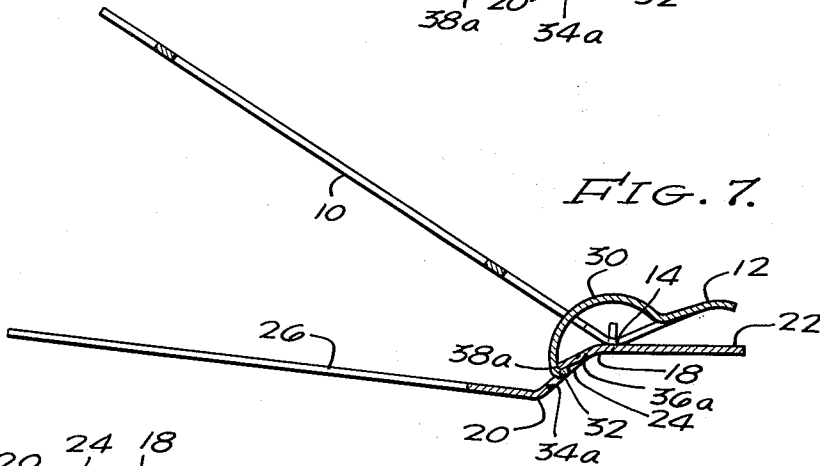
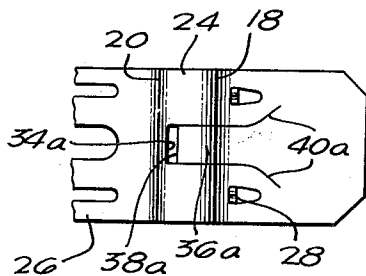


FIG. 8.



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CLAMPS

Filed Feb. 3, 1959

3 Sheets-Sheet 3

FIG. 9.

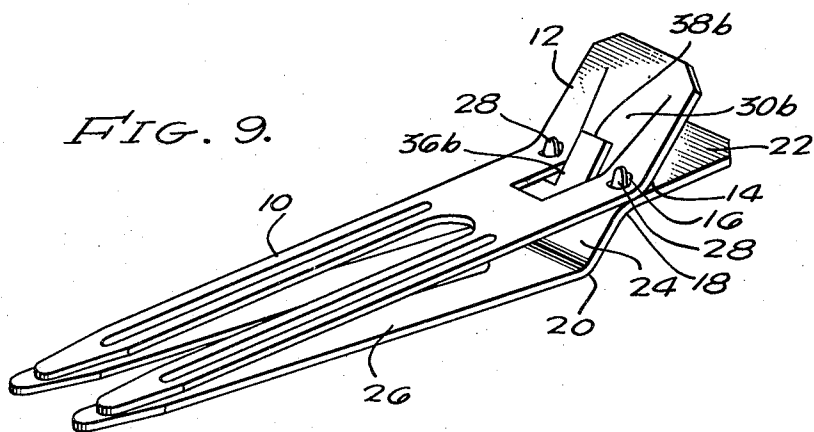


FIG. 10.

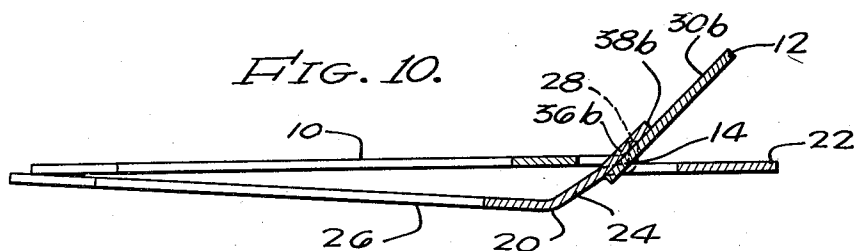


FIG. 11.

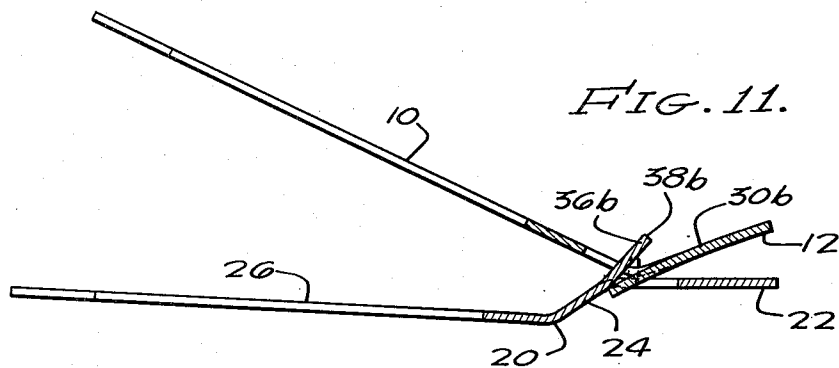
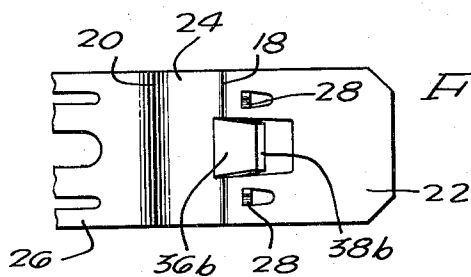


FIG. 12.



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1

3,106,214
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6 Claims. (Cl. 132—48)

This invention relates to pivoted clamps or clips, and more especially to two-piece metallic pivoted clamp or clip assemblies wherein integral portions of the metallic clip parts are utilized to form spring means to bias the clamp arms to closed position. Such devices are of a construction such as to obviously have a wide range of possible utility, but they are herein described in conjunction with their utility as pin curl clips, wherein they are employed for clamping a lock of hair to maintain it in a form known as a "pin curl."

Pin curl clips are widely used in the curling and setting of women's hair and many varieties have been developed for this purpose. In recent years, two-piece all-metal clips have become the most popular for the stated use because of the manufacturing economy of this type and because of the development of reliable integral spring means for suitably holding the two pieces together and affording effective pivot and resilient biasing means therefor, while providing a satisfactory clamping action. Probably the leading example of such a two-piece clip is shown in U.S. Reissue Patent Number 23,163, issued November 1, 1949, to Armand Braga and myself, and the present invention is an improvement of the constructions disclosed therein.

One of the advantages of the constructions of the aforementioned reissue patent is that they provide two-piece constructions wherein the spring means is in the nature of an integral resilient tongue struck from one of the pieces and that the said tongue is so engaged with the other piece as to serve the dual function of tending to hold the two pieces together in the pivot area as well as to continuously bias the clamping arm portions thereof towards their closed position.

While such constructions have proven eminently satisfactory and have come into wide-spread popular use, they present certain problems in the manufacture thereof. In spring arrangements for two-piece all-metal clips of the type under discussion, the fabrication of the integral spring tongue of one of the parts (usually by a stamping technique) requires intricate tooling and the long, narrow tongue element is necessarily a thin and relatively frail portion of the structure. In the mass production methods used in the manufacture of such clips the two pieces which form the finished clip are separately handled through the various handling and treating steps necessary prior to final assembly. Thus, the pieces may require heat treatment, deburring, plating, lacquering or other treatment prior to assembly and are generally handled in bulk for these purposes. In such bulk handling the parts are subject to treatment which is rough enough to cause variations in the configuration and characteristics of the spring tongue portions of one of the types of pieces. Such variations are critical in the operation of the final assembled clips, but they are so small in magnitude that inspection is difficult or impractical. Accordingly defective parts can only be discovered after assembly of the mating parts, by operation of the finished clip. If the difficulty is detected at this time, not only the bad part but a perfectly good mating part are disposed of as scrap, since the labor involved in separating the parts makes salvage impractical. It is therefore true that the critical nature of the spring configuration, in the prior art constructions hereunder discussion, is such that good parts, and labor involved in handling and assembly, are wasted

2

along with the bad parts, since inspection is impractical until the mating parts have been assembled.

The need for manual inspection described above is a major factor in precluding the use of automatic assembly and packaging techniques in the manufacture of pin curl clips and is a serious cost problem in the art, due to the fact that such devices are manufactured in extremely large quantities.

The present invention provides improved constructions wherein a spring member is provided on each of the pieces of the two-piece clip assemblies and the two spring members are so arranged as to cooperate with one another in biasing the clamp arms thereof to a normally closed position. This division of the spring function between two elements, where it was previously performed by only one, makes it possible to either augment the old spring construction so that the danger of sub-quality finished clips and of scrap is obviated, or to make possible the design and use of simpler spring constructions on either or both of the clip pieces. In general, the constructions of the present invention provide improved spring arrangements for clips of the class under discussion. Such improved constructions have the advantage of making variations in spring constructions, due to the bulk handling discussed above, less critical.

It is known that there are existing prior art constructions utilizing two springs on mating clamp parts to cooperate to bias the parts toward their closed position, but such prior art constructions appear in arrangements wherein the disposition of both spring elements is in an arrangement such that the direction of its force tends to pull the clamp pieces apart at the pivot area, that is, to destroy the clip, but for the mechanical locking of a pivot pin or the equivalent locking structure. Such prior art arrangements are always subject to the disadvantage that the spring is constantly working to tear the clip apart, and the addition of a second spring, still operating in a destructive direction serves to magnify this disadvantage rather than to overcome it as does the present invention.

The present invention overcomes the difficulties attendant to variations caused by the bulk handling of parts to such an extent that manual inspection after assembly is unnecessary and the use of automatic assembling and packaging methods is now made possible. Moreover the use of a plurality of springs makes possible greater tensions, as desired, as well as a wide variety of possible sizes and shapes of spring tongues. This is important, not only from the point of view that it permits a wide variation in the desired designed appearances of the clips in the spring areas thereof, but also from the manufacturing standpoint since it permits spring size and configuration designs which are free from entanglement in processing.

It is therefore an object of the present invention to provide novel two-piece clamp constructions which are characterized by improved spring design.

A further object of the present invention is to provide novel two-piece clamp or clip constructions wherein cooperating spring means integral with each of the two pieces cooperate to jointly provide resilience for biasing the clamping jaw portions of the pieces toward normally closed position.

Another object of the present invention is to provide novel two-piece pin curl clip constructions wherein a plurality of spring members, each integral with one of the pieces, cooperate to tend to hold the pieces together at the pivot area thereof as well as to bias the clamping jaw portions thereof toward a normally closed position.

Yet another object of the present invention is to provide clamp constructions which lend themselves to configurations wherein manufacturing difficulties and waste are minimized by virtue of the provision of a plurality of

3

spring members which divide the spring function formerly performed by a single spring member.

A still further object of the present invention is to provide improved two-piece all-metal clamp constructions of the type wherein spring means are used to urge the clamping jaw portions of the pieces toward a normally closed position, such constructions being characterized in that each of the two pieces has an integral spring tongue and in that the two spring tongues cooperate with one another both to tend to hold the pieces in assembled relationship and to urge them toward the said normally closed position.

These and other objects and the attendant advantages of this invention will be apparent from the following detailed description and claims, taken in conjunction with the attached drawings, wherein like parts are indicated by like reference numerals, and wherein:

FIG. 1 is a perspective view of a pin curl clip embodying the present invention;

FIG. 2 is a central sectional view taken longitudinally of the clip shown in FIG. 1;

FIG. 3 is a sectional view similar to FIG. 2, with the clip in its open position;

FIG. 4 is a fragmentary plan view of the handle portion of the lower member of the pin curl clip of FIGURES 1 to 3, in reduced scale, illustrating the nature and extent of the spring member in said bottom member;

FIGURES 5, 6, 7 and 8 are views similar to FIGURES 1, 2, 3 and 4, respectively, illustrating a second embodiment of the present invention; and

FIGURES 9, 10, 11 and 12 are view similar to FIGURES 1, 2, 3 and 4, respectively, illustrating a third embodiment of the present invention.

It should be understood that the advantages of the present invention, as discussed herein, as well as that of my prior invention may be adapted to clamp constructions of two or more pieces wherein the clamp elements are mechanically interconnected by means other than the spring, since the utilization of spring constructions which tend to hold the parts together rather than to force them apart in disassembly is obviously advantageous whether or not other means for holding the clamp pieces together are used. Therefore, although the present invention is disclosed herein in various specific embodiments which have an open-face pivot and rely solely on the spring elements to hold the clamp pieces together, it is to be understood that such disclosures are by way of example only, and are not intended to be limiting in this regard.

Attention is now directed to the drawings, wherein FIGURES 1 to 4 show one embodiment of the present invention, as applied to constructions of the nature of the illustrated embodiment of my prior reissue patent mentioned hereinabove, which is in the form of a pin curl clip. Such pin curl clip constructions consist of two superposed elongated platform clamp pieces, forming the top and bottom members of the clip. The top member comprises a clamping jaw portion 10 and a handle portion 12 angularly related to the clamping jaw portion so that the vertex 14 acts as a pivot. In practice sheet metal is not normally bent about a sharp corner (since it might crack) but is rather bent about an arcuate surface. Due to this fact and by reason also of the thickness of the sheet material, the surface on which the top member pivots comprises a curved surface rather than a line of intersection of two planes. Therefore, the word "vertex" as used herein describes the pivot surface of the top member, whether it be a line or a curved surface. The top member is also provided with a pair of small openings or sockets, in the area of the vertex 14, preferably near the outer lateral edges of the configuration.

The bottom member comprises a platform configuration having two transverse bends 18 and 20 therein and forming a handle portion 22, an angularly downwardly related intermediate portion 24, and an upwardly angu-

4

larly related clamping jaw portion 26, which may be roughly parallel to the handle portion 24. A pair of points or spurs 28 are provided in the area of the bend 18, in positions near the lateral edges of the bottom piece and so arranged as to be engageable in the sockets 16 of the top piece when the two pieces are assembled. In such an arrangement the spurs 28 may be formed by striking material up from handle portion 22, in the vicinity of the bend 18, as shown in the drawings. The two clip pieces, in view of their function for use as pin curl clips, are each of generally skeletal construction in the clamping jaw portions thereof, such configurations being suitable for allowing drying of damp hair intended to be held by the clips. Detailed description of the configuration is not considered necessary herein since the specific shape and solidity of the clamping portions of clamps of the type under discussion is not of the essence of the present invention.

The construction of the top and bottom members described hereinabove adapts them to be assembled as shown in the drawings, with the spurs 28 extending through the sockets 16, in which position the two clamp pieces will have relative rocking movement in the area of the said spurs and sockets, in response to appropriate manipulation of the handle portions 12 and 22. In this rocking movement, the vertex 14 of the angle formed by the angularly related handle portion 12 and the clamping jaw portion 10 of the top member serves as a pivot and rocks or rolls on the adjacent surface area of the bottom member for this purpose, while the spurs 28 cooperate with the sockets 16 to prevent relative lateral or longitudinal movement of the two clip members.

The top clamp member is provided with a spring member 30 which is in the nature of an integral resilient extension or tongue struck from the material of the top member from the handle portion 12 and from the adjacent area of the clamping jaw portion 10 thereof. Spring member 30 has its root in the handle portion 12 and a free end extending across the pivot area and is provided with means to engage the under side of the lower member in order to perform the dual function cited as an advantage of my aforementioned prior invention, namely that of holding the two clamp pieces together and of biasing them toward a closed position. For this purpose the spring member 30 is provided with a flange or hook 32 at its end and the bottom member is provided with a ledge upon which said hook may be engaged. In the illustrated example the said ledge is provided by the edge of an aperture 34 formed in the intermediate portion 24 of the bottom member, the hook 32 of the spring engaging the edge of the aperture as shown in the drawings.

As stated in the opening remarks and in the statement of the objects of the invention, the spring member 30 thus far described is augmented by a second spring means which is so disposed as to assist the spring member 30 in its function of biasing the clamping jaw portions towards closed position. The second spring means is provided in the embodiment of FIGURES 1 to 4 by forming a spring member 36 in the bottom member. Spring member 36 is an integral resilient extension or tongue which has its root in the area of bend 20 and the root may extend into the adjacent part of the clamping jaw portion 26 if desired (see FIGURE 4) and has a free end 38 which extends beyond the pivot area of the clip as defined by the spurs 28. The spring member 36 is formed by slitting the material as at 40 in areas laterally displaced from the hole 34 and the free end 38 thereof is turned up to engage the under side of the handle portion 22 of the top member, as shown in the drawings. In such an arrangement, with the parts assembled as shown in the drawings, the pin curl clip is held assembled by engagement of hook 32 of the integral resilient extension 30 with the edge of the hole 34 of the bottom member as previously described. The clamping portions 10 and

5

26 are biased toward closed position shown in FIGURE 2 by the spring tension of the free end 38 of the spring member 36 of the bottom piece against the lower side of the handle portion 12 of the top piece as well as by the spring tension of spring member 30 of the top piece in its engagement on the rim of the hole 34, the two spring members thus cooperating to hold the two pieces together and augmenting one another in the function of providing spring pressure tending to keep the clamping portions in closed position. This functioning of the two spring elements is further illustrated in FIGURE 3, showing the clip in its open position and indicating by comparison with FIGURE 2, the reaction of the spring members to the opening of the clip whereby each spring is deflected to develop a portion of the desired total closing force.

Attention is now directed to FIGURES 5 to 8 illustrating another embodiment under the present invention, wherein two spring members assist one another both in the function of tending to hold the clamp pieces in assembled relation and in the function of biasing the clamping portions thereof toward closed position. The illustrative embodiment of FIGURES 5 to 8 is structurally identical with that of the previously described embodiment of FIGURES 1 to 4 except in the construction and disposition of the spring member of the bottom clip piece, and this distinction may best be seen by comparing FIGURES 4 and 8 of the drawings. In the embodiment of FIGURES 5 to 8 the spring member 36a is formed in opposite direction to that of the first described embodiment (FIGURES 1 to 4). Thus, the spring member is formed by striking up a resilient tongue member from the material of the bottom piece, the tongue member having a general shape as indicated by slits 40a and having its root in the handle portion 22, extending across the pivot area defined by spurs 28 and including material from the intermediate portion 24. An opening 34a is also punched out, as shown, to permit the hook 32 to be positioned over the edge of the spring 36a. When the parts are assembled, the hook portion 32 of the upper piece engages under the edge of the free end 38a of the spring member 36a. In such an arrangement (see FIGURE 6) each of the spring members 30 and 36a is pre-loaded by assembly of the parts in a direction tending to hold the parts in assembly as well as to bias the clamping portions thereof to closed position. When the handle portions 12 and 22 are operated to move the clamping portions to open position, as shown in FIGURE 7, the two spring members cooperate directly at their ends (where the hook 32 of spring member 30 engages the free end 38a of spring member 36a) to perform their dual spring functions. It should be noted that the distribution of the flexing necessary to allow the opening movement is divided between the two spring members. Accordingly, all of the desired spring functions may be performed without depending upon spring design (of a single spring) which is so close to the ultimate capacity of the spring as to cause sub-standard assemblies due to very slight variations which are inherent in the handling, treatment, and assembly of the parts. The prior art difficulties in this regard and the advantages of the present invention in this connection have been fully discussed elsewhere in this specification.

A third illustrative embodiment is shown in FIGURES 9 to 12, in order to further show the scope and advantages of the present invention. As previously stated, the advantages of the dual spring arrangement of the present invention make possible wide variation in the size and configuration of the spring members of such clamps. In many prior art designs, the need for a given degree of flexing movement and a required minimum spring force requires the use of relatively long springs of generally bowed construction, which are difficult to form and are relatively easily distorted either in handling or in use. The present invention makes possible the use of relatively flat, short spring members by virtue of the divi-

6

sion of the forces between the two spring members. In the illustrative embodiment of FIGURES 9 to 12 the construction is generally similar to that of the two previously described embodiments, and most particularly the second embodiment, the spring members 30b and 36b of FIGURES 9 to 12 being roughly equivalent to the elements 30a and 36a of FIGURES 5 to 8 insofar as the functions of the elements are concerned. Referring now to FIGURES 9 to 12 it may be seen that spring member 30b is a relatively flat, short integral resilient extension or tongue slit from the handle portion 22 of the top member, having its root adjacent the end of the handle portion and extending slightly beyond the pivot area of the clip as defined by the vertex 14 and the sockets 16. Spring member 36b of the bottom member is a similar short resilient extension or tongue struck up from the material of the bottom clamp piece and having its root in the material of the intermediate portion 24 of the bottom clamp piece and a free end extending beyond the pivot area as defined by the spurs 28. Thus, when the top and bottom members are assembled as shown in FIGURES 9 to 11, with spring members 30b and 36b prestressed to positions wherein the lower side of spring member 36b engages the upper surface of spring member 30b in the pivot area of the clip, the two spring members are prestressed both to tend to hold the clamp pieces in assembled relationship and to tend to spring bias the clamping jaw portions thereof toward closed position. Such constructions, utilizing relatively simple spring member configurations, are relatively simpler to fabricate than are the more complex bowed spring forms which were common in the prior art. Moreover, the flat configurations of both clamp pieces is particularly advantageous in reducing tangling and damage difficulties in the bulk handling involved in treatment and assembly of the parts.

From the above it may be seen that the present invention provides new and improved clamp constructions of general utility as well as of utility for the specific hair grooming function for which the illustrative embodiments are particularly designed. Such constructions are characterized, as pointed out hereinabove, by novel dual spring arrangements which improve the operating characteristics thereof, which obviate some of the difficulties of manufacture and of inspection and packaging inherent in the most advanced of similar prior art devices, and which make possible wide departures from design restrictions imposed by the prior art use of a single spring element in such devices.

Obviously, many further modifications and variations of the present invention are possible without departure from the spirit of the invention. As briefly discussed hereinabove, the use of a pair of cooperating spring elements to both hold clamp pieces together and to bias the clamping jaws thereof towards closed position is advantageous whether other means for holding the clip together are utilized or not. Moreover, changes in the shapes of clamping jaws and of spring elements associated therewith are obviously possible within the scope of the present disclosure and it should be understood that variations of either the shape or function of clamps including the novel spring tongue arrangements of the present invention are intended to be within the scope of the present invention, since the illustrated embodiments are intended to be by way of example only. It is therefore to be understood that the invention is not intended to be limited by the particular illustrative examples described herein, but rather by the scope and language of the appended claims.

What is claimed is:

1. A clamp comprising two superposed elongated plates extending longitudinally with each other, having integral handle portions and clamping jaw portions, said plates having correlated means integral respectively with said plates, said means engaging each other and enabling said plates to rock upon each other upon a transverse axis toward an open position, one of said plates having a

resilient integral extension struck from its material and projecting across said axis toward the clamping jaw portions, said resilient integral extension having a hook at its free end, the other of said plates having a resilient integral extension struck from its material and projecting across said axis towards said handle portion and thus having a root on the clamping jaw side of said axis and a free end on the handle side of said axis, the last named extension having an edge in the area of the root thereof for engagement by said hook, the free end of said last named extension being bent upwardly into contact with the adjacent surface of the handle member of said first mentioned plate, said hook being engaged by said edge.

2. A clamp comprising two superposed elongated plates extending longitudinally with each other, having integral handle portions and clamping jaw portions, said plates having correlated means integral respectively with said plates, said means engaging each other and enabling said plates to rock upon each other upon a transverse axis toward an open position, one of said plates having a resilient integral extension struck from its material and projecting across said axis toward the clamping jaw portions, said resilient integral extension having a hook at its free end, the other of said plates having a resilient integral extension struck from its material and projecting across said axis towards said clamping portion and having a free end on the clamping portion side of said axis, said hook being engaged by the free end of said last named extension.

3. A clamp comprising superposed top and bottom elongated plates extending longitudinally with each other, having integral handle portions and clamping jaw portions, said plates having correlated means integral respectively with said plates, said means engaging each other and enabling said plates to rock upon each other upon a transverse axis toward an open position, the said top plate having a resilient integral extension of flat form and of relatively short length struck from its material and projecting across said axis toward the clamping jaw portions, the said bottom plate having a resilient integral extension of flat form and of relatively short length struck from its material and projecting across said axis toward the handle portions, the two said extensions being so interengaged, in the vicinity of the said axis, that the top surface of the extension of the top plate is in engagement with the bottom surface of the extension of the bottom plate.

4. A clamp comprising a pair of elongated superposed plates bent to provide jaw portions and handle portions and to provide a rocking relation, spur members on one of said plates and socket members on the other of said

plates to prevent relative longitudinal and transverse movement between said plates, a tongue struck from the upper of said plates and engaging the remote outer surface of the lower plate and a second tongue struck from the lower plate and engaging said first mentioned tongue, said tongues cooperating to hold the two plates in assembled relationship and to constantly urge said jaw portions towards closed position.

5. In a hair clip for holding together flat curls comprising a pair of superimposed clip arms extending longitudinally of one another and having confronting clamp jaw-forming portions adapted to clamp a hair curl therebetween and longitudinally outwardly diverging handle-forming end portions, the inner ends of which terminate in a fulcrum where the arms are relatively rockable about a transverse axis to open and close the jaws of the clip, the improvement comprising means for resiliently urging the jaws of the clip together, said means comprising a resilient tongue extending from the handle-forming portion of one of said arms toward the jaw-forming end of the clip and projecting beyond said fulcrum, and a resilient tongue extending from said other arm from a point on the side of said fulcrum nearest the jaw-forming end of the clip and projecting toward the handle-forming end of the clip, at least one of the tongues extending past said fulcrum and resiliently interlocking with the other tongue to urge the clip jaws together.

6. In a hair clip for holding together flat curls which comprises a pair of superimposed, elongated plates extending longitudinally of one another and having confronting clamp-jaw-forming portions at one end adapted to clamp a hair curl therebetween and longitudinally outwardly diverging, handle-forming portions at the other end thereof, the inner ends of said handle-forming portions terminating in a fulcrum where the plates are relatively rockable to open and close the jaws of the clip, the improvement comprising means for resiliently urging the jaws of the clip together comprising a resilient longitudinal tongue struck from the handle-forming portion of one of said plates and projecting toward the jaw-forming end of the clip, and a resilient longitudinal tongue struck from the other plate, said tongues being in the region of said fulcrum and resiliently interlocking with each other to urge the jaws of the clip together.

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