May 14, 1940. R. L. EVANS 2,200,266

HAIR CLAMP

Filed Dec. 3, 1937

Fig. 1.

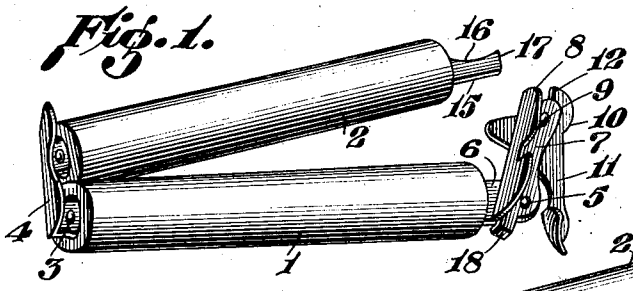


Fig. 2.

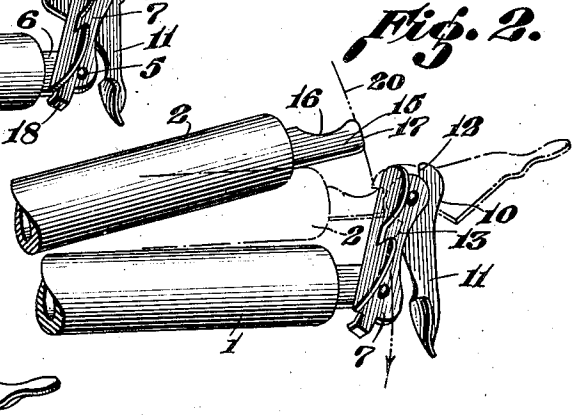
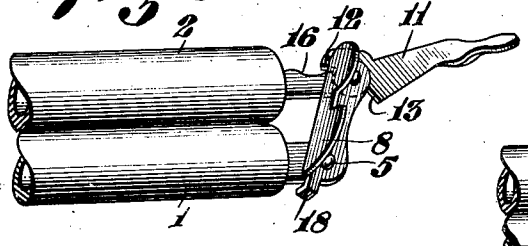


Fig. 3.



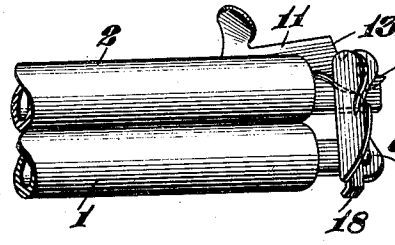


Fig. 4.

Fig. 5.

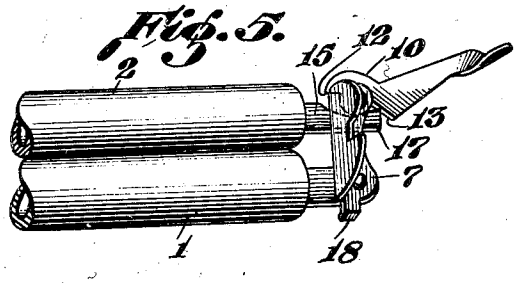


Fig. 6.

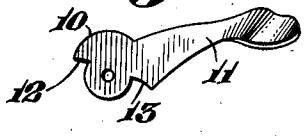


Fig. 7.

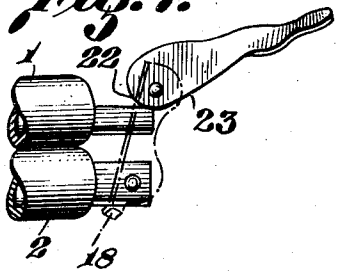
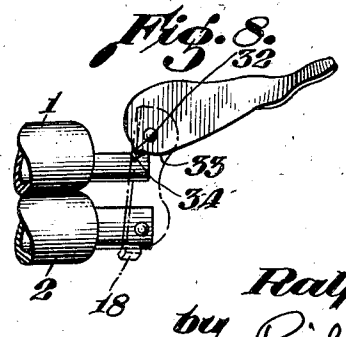


Fig. 8.



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Patented May 14, 1940 2,200,266

UNITED STATES PATENT OFFICE

2,200,266

HAIR CLAMP

Ralph L. Evans, Bay Shore, N. Y.

Application December 3, 1937, Serial No. 177,851

12 Claims. (Cl. 132—36.1)

My invention relates broadly to improvements in the operation of certain mechanical devices, notably toggles, cams and the like, and more particularly to the use of such devices as means to obtain and assure firm closure under pressure of hair clamps, especially those used in the process of permanently waving hair.

The use of toggles, cams and similar devices for the purpose of multiplying mechanical advantage in securing closure pressure is not new. Common practice, as in the croquignole method of waving, includes the use of a clamp having two parallel jaws hinged to each other at one end, the first of said jaws having pivoted to its free end one of a link, said link carrying a cam pivoted thereto at its other or free end. In closing the clamp, the jaws are manually moved into engagement with the tress of hair to be clamped, usually by grasping and squeezing them with one hand; the link is then manually moved about its pivot by the other hand to bring its cam over the projecting free end of the second jaw and thereafter rotation of a lever extension of the cam causes the cam to force the jaws toward each other, causing the clamp to lock the tress with very firm pressure.

A disadvantage of present designs resides in the fact that the engagement and/or disengagement of cam and clamp jaw are often difficult, due to inadequate finger room, stiff action of the link hinges or otherwise. The adjustment or removal of the clamp may then become awkward or difficult, and when the cam lever and link are manually pulled to open position or manually pushed to closed position the hand holding the clamp or that operating the cam and link may slip, causing the patron to experience painful pulling of her hair.

My invention comprehends a device to promote the engagement and disengagement of the cam with the free end of the clamp jaw to facilitate smooth placement of the clamp upon or its removal from the hair of the patron without danger of pulling the hair.

More specifically, my invention contemplates a clamping device in which all the actions and reactions in operating the link and cam, in locking the clamp closed and/or in breaking the lock, inherently take place between the clamp parts themselves and none between the tress of hair and the clamp, thereby avoiding any pull on the hair.

In the practice of my invention, I conveniently give the cam member a contour which coacts with the free end of the clamp jaw to cause longitudinal translational motion of the cam with respect to the free end of the clamp jaw, the free end of the clamp jaw being of such shape as to properly coact with said cam member contour to effect this result. While the contour given the cam member may take various forms, the cam member may advantageously be provided with shoulders having faces preferably approximately radial to the cam axis.

To effect a locking of my clamp it is only necessary to move the free end of the clamp jaw and the link and cam together until one portion of the contour, or one radial face, of the cam overlaps the outer corner of the clamp jaw. Rotation of the cam lever then causes in sequence both translational motion of the cam axis into locking position and closing pressure on the clamp jaw due to cam action, thus locking the clamp.

I may further obviate the necessity of initially moving the link into position where its cam can pick up the free end of the clamp jaw preliminary to locking it, as for instance, by providing a stop on the link to prevent its opening beyond the point where the cam when actuated can pick up the end of the clamp jaw. This avoids any pull on the tress during the locking operation.

To effect unlocking of my clamp, the rotation of the cam lever is reversed which first relaxes cam pressure. Further reverse rotation causes a portion of the cam contour, or the other radial face of the cam if employed, to butt against the outer end of the clamp jaw stopping simple rotation of the cam in its seat except with accompanying longitudinal translational motion of the entire cam and link in a direction to completely disengage the cam and link from the clamp jaw. Disengagement is positive and unavoidable if the cam lever is completely rotated, thus effecting a release of the clamp without possibility of pulling on the tress.

Among the important advantages of my invention are:

(1) The force applied to the cam lever arm is but a small fraction of that required to produce engagement or disengagement of the cam, due to ratios of lever arms;

(2) The forces are applied directly between parts of the clamp and do not pass through the arms and shoulders of the operator, thus giving far smoother control, and complete absence of jerks and pulls on the hair; and

(3) When the jaws of the clamp are brought together the parts of the locking mechanism are always in position to be operated by the cam lever and do not require independent positioning.

Other novel features and advantages of my invention will hereinafter appear.

Without limiting my invention or claims thereto, the accompanying drawing shows for purposes of exemplification a preferred embodiment of my invention.

Fig. 1 is a perspective view showing a clamp embodying the features of my invention.

Fig. 2 is a detail, in perspective, showing in full lines the locking mechanism in initial position preliminary to operation of the cam lever, and in dotted lines the initial actuation of the cam lever.

Fig. 3 is a perspective view showing the locking parts in intermediate position.

Fig. 4 is a perspective showing the locking parts in full locked position.

Fig. 5 is a perspective showing the cam locking lever moved to an intermediate unlocking position, and

Fig. 6 shows a detail of the cam and its operating lever.

Figs. 7 and 8 show modifications of my structure.

Referring to the drawing, the clamp jaws 1, 2, are shown hinged at 3 to the end clamp bracket 4. Pivoted at 5 to the front extension or arm 6 of the jaw 1 is a link 7 carrying the usual bracket 8 while pivoted at 9 to the upper end of the link 7 is the cam 10 provided with an operating lever 11. The cam is shown in Fig. 6 as having its main cam portion 10 cut away to provide a shoulder or pick-up portion having a face 12, the cam or lever also being cut away to provide a second shoulder, or kick-off portion, having a face 13, said faces 12 and 13 being shown as substantially radial to the axis of the cam, although their angular positions may vary widely within the spirit of my invention.

The clamp jaw 2 is provided with an extension or arm 15 having a face 16, advantageously incut, and an end face 17 adapted to cooperate with the shoulder faces 12 and 13, respectively, of the cam in effecting the locking and unlocking of the clamp. There may also be provided on the link 7, if desired, a stop such as the extension 18 bent at its end to engage the extension 6, or a fixed part of jaw 1, to limit the movement of the link for the purpose hereinafter indicated.

In the operation of the device the parts are initially in the position shown in Fig. 1 in which the clamp jaws occupy divergent positions. A tress of hair is placed between them and the jaw 2 is manually moved with reference to the jaw 1 through an arc 20 (Fig. 2) until it engages the tress of hair. In this position the end extension 15 of jaw 2 will be in position to have its face 16 engaged by the shoulder face 12 of the cam when the latter is rotated in an anti-clockwise direction, this initial engagement being shown in dotted lines in Fig. 2 and in full lines in Fig. 3. Upon further movement of the cam anti-clockwise, its face 12 will engage on the face 16 of the jaw extension 15 and impart a longitudinal translational movement to the cam pivot 9 to move the cam over said extension 15 and upon further movement of the cam lever in the same direction the cam surface 10 will bear on said face or cam seat 16 to force the clamp jaws together with firm pressure, as shown in Fig. 4.

When it is desired to release the clamp, the cam lever is turned in clockwise direction, as shown in Fig. 5, when the face 13 of the second shoulder will engage the end 17 of the clamp extension 15 and further rotation of the cam lever will force the link 7 away from the extension 15 carrying with it the cam 10 whose face 12 in final open position will be removed from the path of the extension 15, as shown in Fig. 2, permitting the clamp jaw 2 to be opened. The link 7 will be maintained in the position shown in Fig. 1 and in full lines in Fig. 2 by engagement of the stop 18 with the jaw extension 6. It will thus be in position to again effect a locking of the jaws together merely upon manipulation of the cam lever alone. The stop 18 and its function may be omitted, if desired, without modification of the operation of the other features of my invention.

It will thus be seen that both the operation of locking the clamp jaws together and the operation of unlocking them requires merely the manipulation of the cam lever 11 and it becomes unnecessary for the operator to manually move the link 7 either to closed or to open position which might result in a pull on the hair. Such pull on the hair is impossible in my device, since the actions and reactions incident to its operation are all between the parts of the clamp and not between the clamp and the operator or tress of hair on the head.

Fig. 7 shows a modification in which the cam surface is continuous, its portion 22 serving as a pick-up portion and its portion 23 serving as a kick-off portion.

Fig. 8 shows a further modification in which the cam surface is provided with a projection 32 serving as a pick-up portion, and its portion 33 serving as the kick-off portion, the extension being advantageously provided with a recess 34 cooperating with said projection. It is obvious that the recess could be provided in the cam portion to engage a projection on the extension or the upper exposed corner of the extension.

It will be understood that many changes may be made in the forms and features disclosed without departing from the spirit of my invention and that certain features may sometimes be used to advantage without a corresponding use of other features.

What I claim is:

1. In a hair clamp, in combination, two clamp members hinged together at one end, a link pivoted to the opposite free end of one of said clamp members, cam mechanism carried by the free end of said link, said cam mechanism having a pick-up portion adapted upon actuation of said cam mechanism in one direction to engage the free end of the other clamp member and having a cam portion adapted upon further movement of said cam mechanism in the same direction to force said clamp members together, and having a kick-off portion adapted, after said cam mechanism is actuated in reverse direction freeing said cam portion, to engage the free end of said last mentioned clamp member and upon further movement in said reverse direction to force said cam mechanism out of the path of said clamp member to permit the clamp to be opened, and means to limit the movement of said link to a position in which, after the clamp members have again been moved into juxtaposition, said pick-up portion, when actuated, will again engage and pick up said free end of said last mentioned clamp member.

2. In a hair clamp, in combination, two clamp members, a link pivoted to the free end of one of said clamp members, cam mechanism carried by the free end of said link, said cam mechanism having a cam portion adapted to force said clamp

members together and a kick-off portion adapted, after said mechanism is actuated in reverse direction freeing said cam portion, to engage the free end of the other of said clamp members and upon further movement in said reverse direction to force the free end of said link carrying said cam mechanism out of the path of said clamp member to permit the clamp to be opened.

3. In a hair waving clamp, in combination, two clamp members, cam mechanism having a cam portion adapted when actuated to force said clamp members together and a kick-off portion adapted, after said cam mechanism is actuated in reverse direction freeing said cam portion, to engage the free end of one of said clamp members and upon further movement in said reverse direction, to force said cam mechanism out of the path of said clamp member to permit the clamp to be opened.

4. In a clamp, in combination, two clamp members, cam mechanism for closing the same under pressure, said cam mechanism having a kick-off portion adapted, upon reverse movement of said cam mechanism, to engage the free end of one of said clamp members to force said cam mechanism out of the path of said clamp member to permit the clamp to be opened.

5. In a clamp, in combination, two clamp members, cam mechanism having a pick-up portion adapted upon actuation of said cam mechanism in one direction to engage the free end of one of said clamp members, and means to limit the reverse movement of said pick-up portion to a position in which, after the clamp members have been moved into juxtaposition, said pick-up portion, when actuated, will automatically engage and pick up said free end of said clamp member.

6. In a clamp having a clamping member provided with a projecting arm, a hinged link having lever fastening means adapted to engage said projecting arm to lock the clamp shut, said means being provided with means for increasing mechanical advantage to disengage said link and arm when opening the clamp to move said lever fastening means out of the path of said arm to permit the clamp to be freely opened.

7. In a clamp having a clamping member provided with a projecting arm, a hinged link carrying a lever-operated cam adapted to engage said projecting arm to lock the clamp shut, said lever operated cam being provided with means for increasing mechanical advantage to disengage said arm and link when opening the clamp to move said cam out of the path of said arm to permit the clamp to be freely opened.

8. In combination, a clamp member provided with a projecting arm, a lever and cam for engaging and locking said arm, a projecting shoulder on said lever and cam positioned to engage the end of the projecting arm and import relative motion longitudinally thereof to the cam when the lever is moved in the direction to unlock said clamp member to move said lever and cam out of the path of said arm to permit the clamp to be freely opened.

9. In a hair clamp, a movable clamping member and a combination lever and locking cam having a shoulder which, on unlocking the cam by rotating the lever, engages a portion of the clamping member to cause the lever and cam to move out of the path of said member to permit the latter to be freely opened.

10. In a hair clamp, a movable clamping member, cam locking mechanism therefor including a cam provided with a face, substantially plane and substantially parallel to the axis of the cam, adapted during the unlocking operation, to engage said movable clamping member to impart translational motion to said cam to move it out of the path of said member.

11. In a hair clamp, a movable clamping member, cam locking mechanism therefor including a cam provided with means adapted during the unlocking operation, to impart translational motion to said cam to move it out of the path of said member.

12. In a hair clamp, in combination, a movable clamp member incapable of longitudinal movement, cam mechanism having a cam portion which when actuated in one direction forces said clamp member closed and which when actuated in the reverse direction releases said clamp member, said cam mechanism being provided with means whereby, upon further actuation in said reverse direction, disengagement between said clamp member and said cam mechanism is effected to permit said clamp to be fully opened.

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