No. 851,661. PATENTED APR. 30, 1907.

A. M. HEWLETT & G. F. VAN BRUNT.

CLAMP.

APPLICATION FILED NOV. 13, 1903.

Fig. 1.

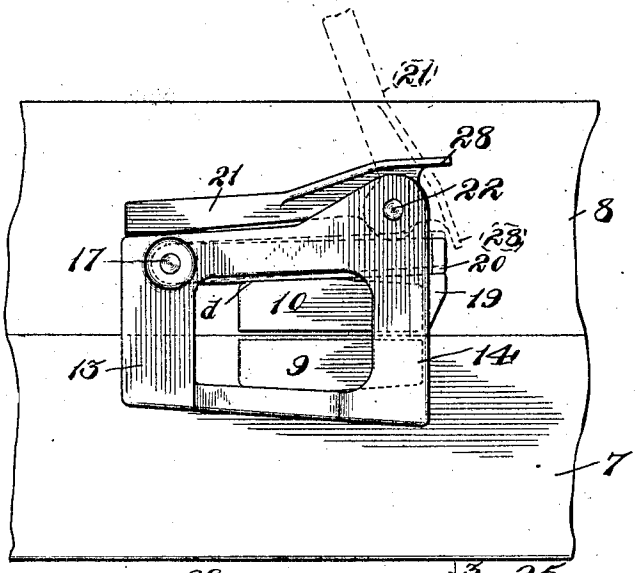


Fig. 3.

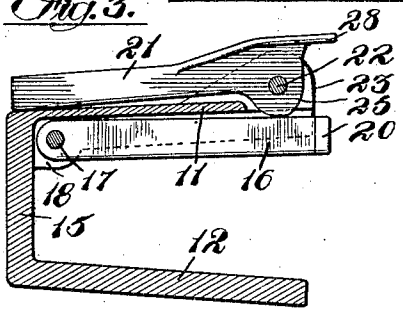


Fig. 2.

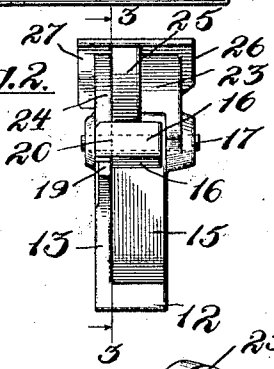


Fig. 5

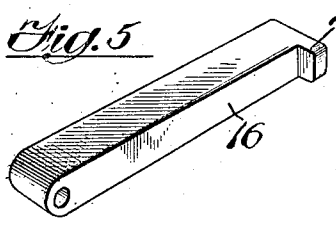


Fig. 4.

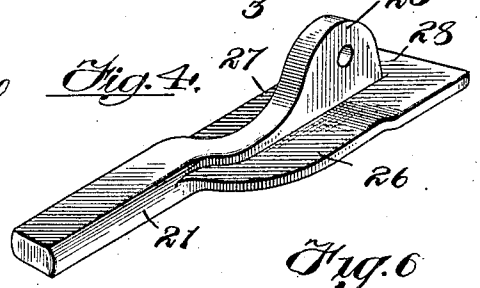
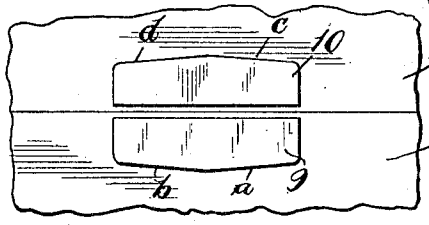


Fig. 6



Witnesses:

Robert F. Wirt

G. V. Donnarus

Inventors

Alfred M. Hewlett,
George Van Brunt,
by Donald Adams Richards & Jackson.
their Attys.

THE NORRIS PETERS CO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE

ALFRED M. HEWLETT AND GEORGE F. VAN BRUNT, OF KEWANEE, ILLINOIS; SAID VAN BRUNT ASSIGNOR TO SAID HEWLETT.

CLAMP.

No. 851,661. Specification of Letters Patent. Patented April 30, 1907.

Application filed November 13, 1903. Serial No. 181,103.

To all whom it may concern:

Be it known that we, ALFRED M. HEWLETT and GEORGE F. VAN BRUNT, citizens of the United States, residing at Kewanee, in the county of Henry and State of Illinois, have invented certain new and useful Improvements in Clamps, of which the following is a specification, reference being had to the accompanying drawings.

Our invention relates to clamps, and has for its object to provide an improved clamp having great latitude of adjustment, in connection with lever-mechanism arranged to act quickly and powerfully to secure an efficient clamping action, also to provide a clamp which is self-adjusting with regard to the parts to be clamped and which may be applied expeditiously and conveniently. The advantages of our improved clamp are hereinafter fully set forth.

We have illustrated our invention as embodied in a clamp especially designed for molders' flasks, but the features of invention hereinafter described, and pointed out in the claims, may be applied to clamps for any and all other purposes to which they are adapted.

In the accompanying drawings,—Figure 1 is a side view of my improved clamp, showing it in position on a flask; Fig. 2 is an end view thereof; Fig. 3 is a sectional view on line 3—3 of Fig. 2; Fig. 4 is an inverted perspective view of the operating-lever; Fig. 5 is a perspective view of the swinging arm; and Fig. 6 is a partial side view of a flask, showing the lugs to which the clamp is secured.

Referring to the drawings,—7 indicates the drag and 8 the cope of a flask, which, as shown in Fig. 6, are provided with laterally-projecting lugs 9—10, respectively, adapted to register when the parts of the flask are assembled. The adjacent or inner surfaces of the lugs 9—10 are parallel, but the outer surfaces thereof are inclined,—the lugs being tapered toward their ends, as shown at *a*, *b*, *c*, *d* in Fig. 6, so that the lugs when brought together form a double wedge.

11—12 indicate, respectively, the top and bottom pieces of the clamp-frame, which are connected at one side by side-pieces 13—14, as shown in Fig. 1. For the purpose of securing greater strength an end piece 15 is also provided, connecting the inner ends of the top and bottom pieces 11—12,—said end-piece being preferably formed integral with the side-piece 13 the top and bottom pieces 11—12 and the end piece 15 thus together form a frame which, generally speaking, may be said to be U shaped. As best shown in Fig. 3, the top and bottom pieces 11—12 are inclined with reference to each other,—their inner ends being closer together than their outer ends but the top and bottom pieces are approximately parallel as their inclination to each other is not marked. All that is necessary is to have a slight flare to insure a proper fitting of the frame upon the article clamped.

16 indicates a swinging clamping arm, mounted at its inner end upon a pivot 17 carried by a lug 18 at the upper inner corner of the frame, as shown in Fig. 3. Said arm 16 is approximately parallel with the adjacent member of the clamp frame—the top piece 11—and consequently is inclined slightly relatively to the bottom piece 12 and it is adapted to swing in the plane of the frame toward and from the bottom-piece 12. Its downward movement is limited, however, by means of a lug 19 which projects from the front edge of the side-piece 14, as shown in Fig. 1, and lies under a laterally-projecting lip 20 carried at the forward end of the swinging-arm 16, as shown in Figs. 2 and 5. The relative positions of the lug 19 and lip 20 are best shown in Fig. 2. The lug 19 is so placed as to hold the arm 16 at the outer end in its inclined position,—the distance between the arm 16 and bottom-piece 12 at their outer ends being made greater than at their inner ends, in order that the clamp may adjust itself automatically to varying distances between, and irregularities of, the lugs 9—10 as it is placed upon or over said lugs.

21 indicates the operating-lever, which is mounted upon a pivot 22 secured in lugs 23—24 carried by the frame above the forward portion of the arm 16, as shown in Fig. 3. Said lever is provided near its pivot with a cam-portion 25, which, when the lever 21 is turned down to a position more or less parallel with the top-piece 11, engages and depresses the forward end of the arm 16. As shown in Fig. 3, the cam 25 lies forward of the front end of the top-piece 11, so that it bears directly upon the upper surface of the swinging-arm 16. When the lever 21 is turned up to the position shown in dotted lines in Fig. 1, the arm 16 is released from pressure, and may rise sufficiently to release

the lugs 9—10. 26—27 indicate lateral wings, carried by the operating-lever, which extend over the lugs 23—24 and serve to protect said lugs. Said wings are preferably formed integral with the lever 21, and they are provided with a forward extension or lip 28 which acts as a stop to limit the upward movement of the lever 21, as when said lever is thrown upward to its highest position the lip strikes the forward edges of the lugs 23—24.

In practice the operator takes the clamp by the operating-lever 21, which is then in the position shown in dotted lines in Fig. 1, and places it upon the lugs 9—10 by an endwise movement,—the swinging-arm 16 riding up on the inclined face of the upper lug 10, while the bottom-piece 12 moves up on the inclined face of the lower lug 9. When the clamp is moved up as far as it will go the lever 21 is thrown down to the position shown in Fig. 3,—thereby forcing down the forward end of the arm 16, and consequently tightly clamping the lugs 9—10 together.

Our improved clamp embodies certain important features of construction and advantages of operation which, so far as we are aware, are entirely novel. In the first place, the upper and lower members of the clamp being set at an angle to each other, all the slack is taken up by said inclined members, so that the cam-lever need be used only for the final tightening or clamping, the clamping members automatically fitting themselves to the parts to be clamped. Consequently, as very slight movement of the clamping-devices has to be effected by the operation of the operating-lever, a slowly-acting cam may be effectively employed,—thereby increasing the power of the operating-lever and insuring a secure hold on the part of the cam. In the second place, by employing an inclined swinging-arm in connection with an operating-lever as described, the upper and lower members of the clamp adjust themselves to the parts to be clamped and to any irregularities in such parts without modifying the action of the operating-lever itself,—that is to say, the inclination of the upper and lower members of the frame of the clamp provides a self adjusting means for the proper fitting of the clamp upon the parts to be secured together, regardless of irregularities therein, while the final tightening secured by the operating-lever is applied directly to the parts to be clamped through the arm, and the effective operation of the operating-lever is always the same, regardless of variations in the thickness of the parts to be clamped. In this respect our improved clamp is radically different from clamps in which a cam acts directly upon the parts to be held together. In such cases differences in thickness of such parts must be compensated for by greater movement of the cam; and to provide a cam with the necessary range of movement involves increasing its pitch accordingly to secure greater rapidity of movement, with a consequent loss in the security of the hold. Obviously, the greater the pitch of the cam, the greater its liability to slip. In the third place, by employing the inclined pivoted arm in connection with the operating-lever as described, we are enabled to secure a much greater application of power to the parts to be clamped than would otherwise be the case, since the parts to be clamped invariably lie nearer the pivot of said arm than the point at which the operating-lever acts thereupon. Said pivoted arm, therefore, acts as a lever of the second class to multiply the power applied to the operating-lever.

So far as we are aware, all prior clamps employing a cam-lever for tightening have been limited to such adjustment as could be secured by the movement of the cam itself; and we believe ourselves to be the first to provide a self-fitting clamp having a greater range of adjustment than that secured by the movement of the cam. We also believe ourselves to be the first to provide a cam-lever clamp adapted to be adjusted to articles of different thicknesses independently of the operation of said cam-lever. Also, we believe ourselves to be the first to provide a clamp arranged to be forced quickly into place to automatically effect a preliminary binding of the parts to be clamped, and provided with a lever or other mechanism for tightening said parts. We further believe ourselves to be the first to provide a self-fitting clamp with compound lever-mechanism for clamping and tightening the parts to be clamped, as well as the first to employ an inclined swinging-arm in the clamp-frame in connection with a lever acting upon the outer end of said arm for securing the final tightening. All the above features are therefore claimed broadly.

We have illustrated and described our improved clamp as applied to a flask, as that furnishes a convenient means of clearly exemplifying the practical application of the invention, but it may, of course, be applied to any other use to which it is adapted, and our invention includes generically all such modifications as would suggest themselves to the skilled mechanic who might contemplate using features of our invention in other situations. We wish it to be understood further that our invention is not restricted to details of construction, except in so far as such details are particularly claimed. Furthermore, it should be understood that while our improved clamp is ordinarily used in a vertical position, it may be otherwise used, and the terms "upper" and "lower" as applied to the members of the clamp frame have been used as conveniently defining the position of

said parts as illustrated, and they should not be construed as in any sense restricting the use of the clamp.

That which we claim as our invention and desire to secure by Letters Patent is,—

1. A clamp, comprising a frame open at one end to receive the object to be clamped and having clamping members disposed approximately in parallelism, one of said members being movable toward the other for clamping purposes, and means for limiting the extent to which said movable member may approach the other clamping member.

2. A clamp, comprising a frame open at one end to receive the object to be clamped and having clamping members disposed approximately in parallelism, one of said members being pivotally supported near one end and movable toward the other for clamping purposes, and means for limiting the extent to which said pivoted member may approach the other clamping member.

3. A clamp, comprising a frame open at one end to receive the object to be clamped and having clamping members disposed approximately in parallelism, one of said members being movable toward the other for clamping purposes, means for limiting the extent to which said movable member may approach the other clamping member, and means carried by said frame for forcing the movable member toward the other clamping member.

4. A clamp, comprising a frame open at one end to receive the object to be clamped and having clamping members disposed approximately in parallelism, one of said members being pivotally supported near one end and movable toward the other for clamping purposes, means for limiting the extent to which said pivoted member may approach the other clamping member, and means carried by said frame for forcing the pivoted member toward the other clamping member.

5. A clamp, comprising a suitable frame having clamping members set a distance apart and adapted to receive between them the object to be clamped, one of said members being pivotally mounted and having one end movable toward the other clamping member for clamping purposes, and means for limiting the extent to which said pivoted member may approach the other clamping member.

6. A clamp, comprising a suitable frame having clamping members set a distance apart and adapted to receive between them the object to be clamped, one of said members being pivotally mounted near one end, its free end portion being movable toward the other clamping member for clamping purposes, and means for holding the free end of said pivoted member at all times further from the other clamping member than the other end thereof.

7. A clamp, comprising a U-shaped frame adapted to receive the object to be clamped, one side of said frame forming a clamping member, clamping means carried at the opposite side of said frame for coöperating with said clamping member, and means for limiting the extent to which the latter clamping means may approach the other clamping member.

ALFRED M. HEWLETT.
GEORGE F. VAN BRUNT.

Witnesses:
RUTH TUNNICLIFFE,
C. E. MCCULLOUGH.