Aug. 22, 1961 H. A. DAUM 2,997,326

LOCKING HANDLE GRIP

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Fig. 1

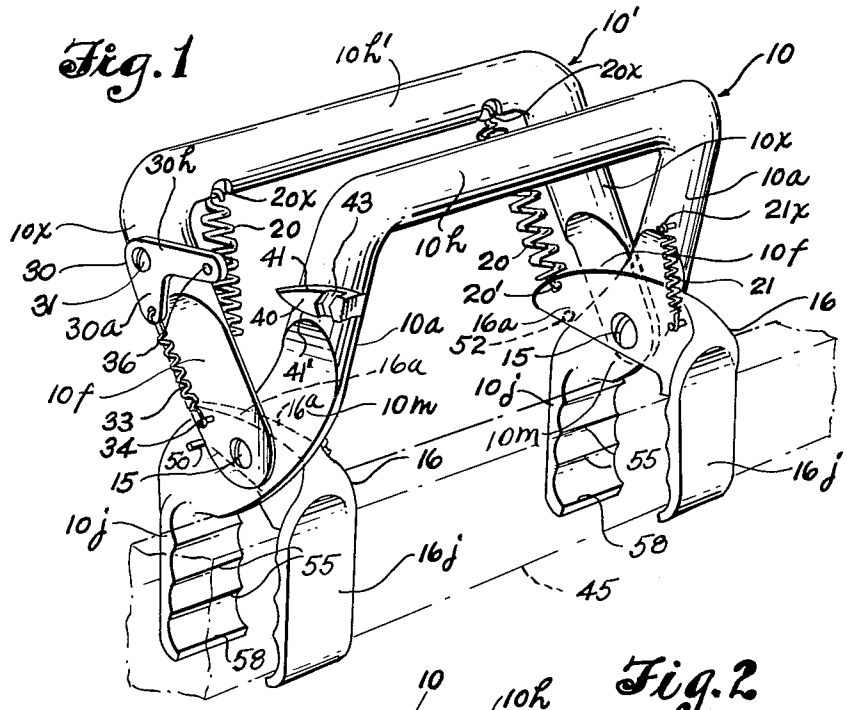
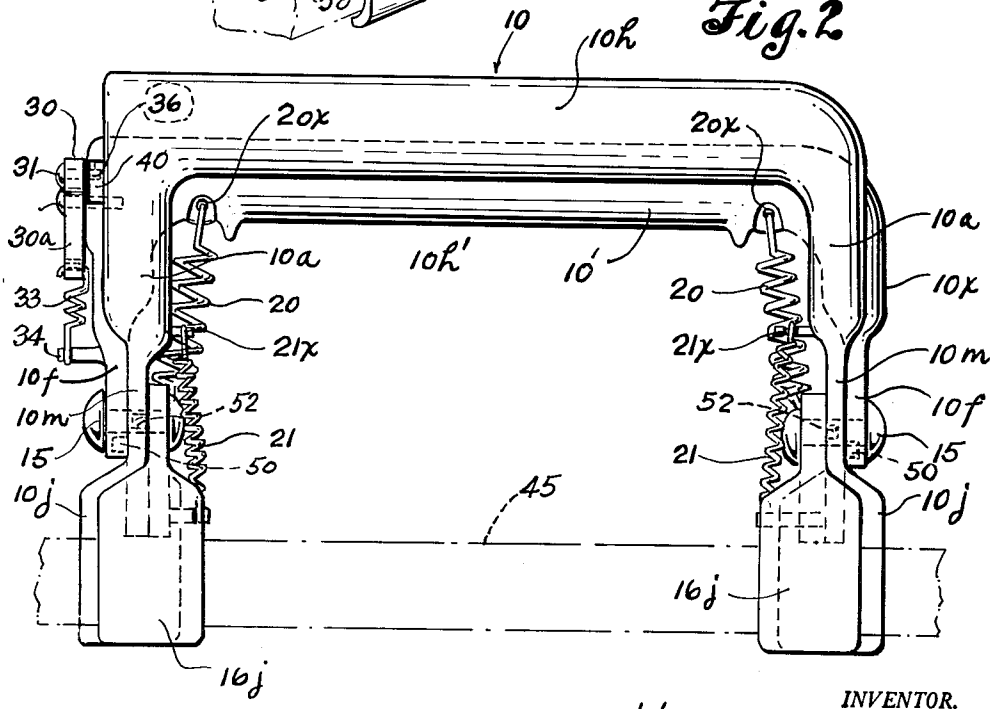


Fig. 2



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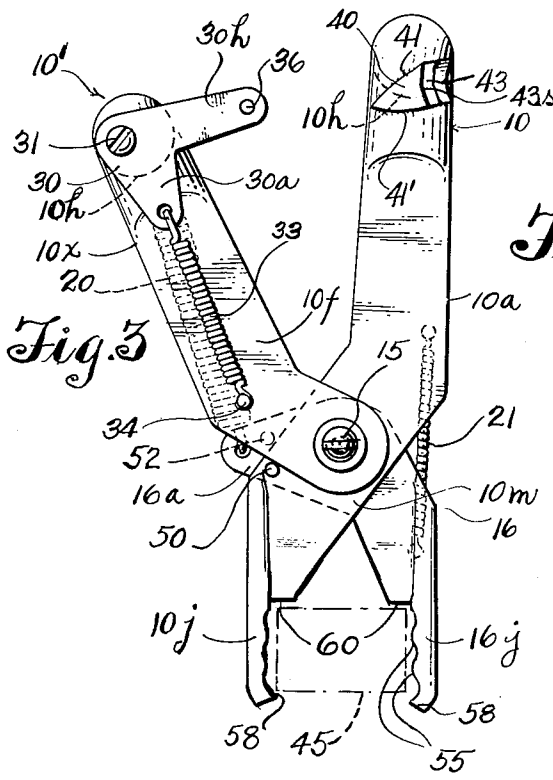


Fig. 3

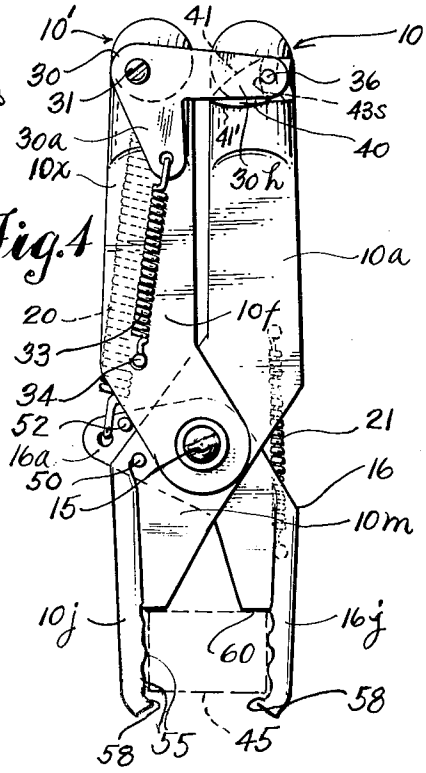


Fig. 4

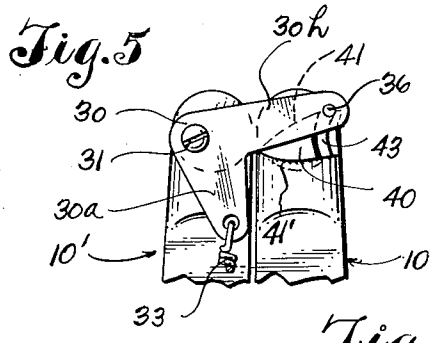


Fig. 5

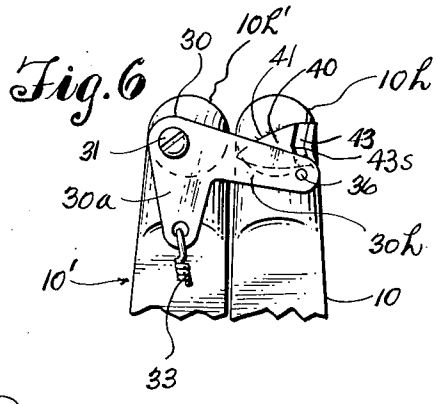


Fig. 6

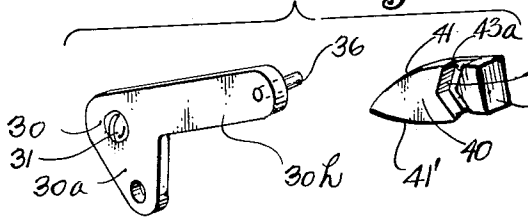


Fig. 7

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Fig. 8

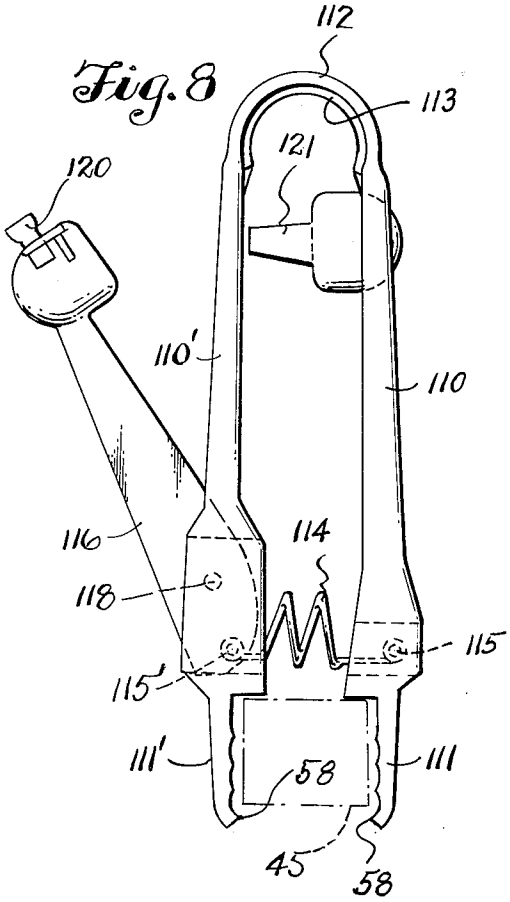
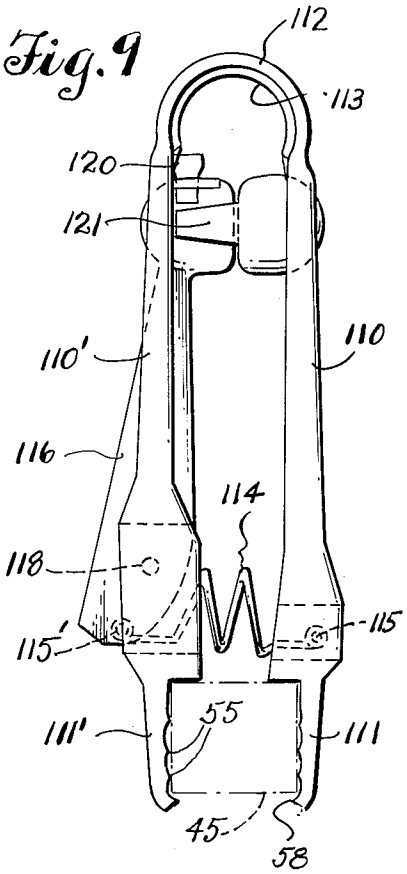


Fig. 9



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2,997,326

LOCKING HANDLE GRIP

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10 Claims. (Cl. 294—16)

This invention relates to devices which are herein designated as "locking grips" or "handle grips." More particularly, the invention relates to devices that may be easily and readily applied to articles that are to be lifted and moved, for temporary use as a practical, convenient and easily releasable handle.

It is the principal object of this invention to provide a novel "handle grip" comprising a pair of pivotally joined handle forming members, comprising hand hold portions that may be readily grasped in one hand for use of the device; which hand hold portions have coacting jaws associated therewith in a novel way that will be opened apart, by spreading the hand hold portions apart, for application to an article to be lifted or handled and then clamped securely thereto and releasably held in clamped condition by a novel latch mechanism that is caused to automatically latch, upon pressing the handles together, to cause the jaws to retain their gripping action, and which latch will automatically release itself, to release the jaws by again applying a firm gripping hand pressure to the hand hold portions.

It is a further object of the present invention to provide a "handle grip" that is especially useful for the lifting of comb foundation frames from bee hives and for other similar operations.

Further objects and advantages of the invention reside in the details of construction of the parts embodied by the handle, jaw and latch mechanisms; in the specific manner of use of springs therewith and in the construction, mode of application, operation and use of the latch means.

In accomplishing the above mentioned and other objects of the invention, I have provided the improved details of construction, the preferred forms of which are illustrated in the accompanying drawings wherein:

FIG. 1 is a perspective view of a handle grip embodied by the present invention shown as applied to the top rail of a comb foundation frame or a similar article.

FIG. 2 is a side view of the handle grip as shown in FIG. 1.

FIG. 3 is an end view of the grip, shown with its coacting jaws and hand hold portions in "open" relationship.

FIG. 4 is an end view, showing the grip jaws in "closed" relationship as in gripping the top rail of a foundation frame and showing the handle latch in "holding" position.

FIGS. 5 and 6 are views of the upper end portions of the paired hand hold members and latch, with the latch shown in its movement to holding and to releasing positions, respectively.

FIG. 7 is a perspective view of the handle grip members shown in disconnected, spaced relationship for explanatory purposes.

FIG. 8 is an end view of a handle grip of an alternative form, shown in open position.

FIG. 9 is an end view of the device of FIG. 8, shown in closed position.

Referring more in detail to the drawings:

In one of its present preferred forms of construction, the device is as shown in FIG. 1, wherein it is seen to comprise complemental handle forming members, designated in their entireties, respectively, by reference numerals **10** and **10'**. Handle forming member **10** comprises a horizontal hand hold portion **10*h***, terminating

at each end in a downwardly directed leg **10*a*** which has an offset jaw **10*j*** at its lower end, joined thereto by a laterally and downwardly directed and flattened intermediate part **10*m***. Both jaws are offset to the same side and are of the like size. The handle member **10'**, likewise comprises a horizontal handle portion **10*h'*** that terminates at its opposite ends in downwardly directed leg portions **10*x*** with flattened end portions **10*f***. In the assembly of these two handle members **10** and **10'**, they are placed with the parts **10*h*—10*h'*** thereof in parallel, coextensive relationship, with the flattened end portions **10*f*** of the short leg portions **10*x*** of the one overlapping the flattened intermediate parts **10*m*** of the other; the overlapped parts being pivotally joined by axially aligned rivets, or bolts as shown at **15**, passing therethrough.

Disposed in opposed relationship to each of the flat jaw portions **10*j*** of handle forming part **10** are relatively short jaw forming levers **16** of bell crank form, each comprising a flat jaw forming portion **16*j*** at one end and a vertically flattened lever arm **16*a*** at its other or upper end that flatly crosses the flattened inside surface of part **10*m*** of the corresponding leg **10*a*** of handle member **10** which carries the opposedly related jaws **10*j***; these crossed parts, at each of the opposite ends of the assembled hand hold members, all being pivoted together by the same rivets or bolts **15**.

Each of the jaw forming members **16** has its lever arm portion **16*a*** connected, at its outer end, as at **20'**, to the lower end of a relatively heavy coil spring **20**, which spring has its upper end hooked into or otherwise connected, as at **20*x*** to the end portion of the hand hold member **10*h'***, as shown in FIG. 2. Also, this same part **16*a*** has the lower end of a relatively weaker coil spring **21** attached to its inner end portion; this latter spring being attached at its upper end under upward pulling tension to the adjacent leg portion **10*a***, as at **21*x***. The arrangement of the coacting jaws **10*j*** and **16*j*** and coil springs **20** and **21** associated therewith is as shown in FIGS. 1 to 4. It is to be further explained that when the coacting jaws **10*j*** and **16*j*** are opened apart incident to the spreading apart of the handle members **10*h*—10*h'***, as in FIG. 3, the springs **20** are relieved of all tension and the smaller springs **21**, under tension, actuate the jaws **16—16** to the full open relationship of FIG. 3. However, when the handle members are pressed together, as in FIG. 4, for closing the jaws together against an object between them, the springs **20** will be placed under substantial tension just as soon as the paired jaws engage the object to be moved or lifted and this tension will increase in accordance with further closing action. The smaller springs **21** under lesser tension, operate only to open the jaws **16*j*** away from jaws **10*j*** with the lessening of tension of springs **20** incident to the spreading of the hand hold members **10—10'** apart.

One of the novel features of this invention has to do with the specific latch mechanism for holding the object gripping jaws against release of clamping pressure after they have been applied to and clamped against an article, until the user of the device intentionally releases it.

A preferred latch mechanism herein shown comprises a latch lever **30** of bell crank form that is pivoted, by a bolt or rivet **31** to the upper end portion of a leg **10*x*** of handle member **10'**. This bell crank lever comprises a downwardly directed arm **30*a*** and a horizontally or transversely directed arm **30*h***. A lightly tensioned coil spring **33** is attached at its upper and lower ends, respectively to the lower end of arm **30*a*** and to a stud **34** applied to the lower part of leg **10*x***. This spring yieldingly retains the arm **30*h*** in that neutral position of rest in which it is shown in FIG. 3. At its outer end, the arm

30*h* has an inwardly directed latching stud 36 fixed therein for a purpose presently explained.

Fixedly mounted on the upper end portion of a leg 10*a* of the hand grip member 10, as in FIG. 3, is a latch block 40 which has a pointed body portion directed toward the bell crank arm 30. This pointed body has an upwardly and laterally curving top surface 41 and an opposite camming surface 41' that curves downwardly and rearwardly. Opposite the point, the block body 40 has a vertically directed channel 43 formed therein that is arched or bowed between its ends in a direction toward the bell crank.

With these latch devices so constructed and applied, as in FIG. 3, to the hand hold members, their use is as follows:

Assuming that the handle grip is to be used for moving or picking up an object such as, for example, a comb foundation frame from a bee hive; the top rail of such frame, being designated by numeral 45 in FIGS. 3 and 4; the unlatched hand hold portions 10—10' are opened apart by tension of springs 21, and incident thereto the coacting pairs of jaws, 10*j* and 16*j*, are opened apart for their application about or over the rail 45 as shown in FIG. 3. The user, while holding the device in one hand, then presses the handle portions 10*h*—10*h*' together as from positions of FIG. 3 toward positions of FIG. 4. This stretches the spring 20 and causes the coacting paired jaws at each end of the grip to move toward each other and to be clamped against opposite faces of the rail. Then, as the hand hold portions 10*h*—10*h*' move farther together, with the jaws clamped against opposite sides of part 45, the springs 20 are placed under a substantial tension, which increases as the handle members are further closed together as in FIG. 4. Thus, the rail 45 is gripped under the greater tensioned force of the two springs 20 as only slightly resisted by springs 21.

With the closing of the handle portions 10—10' together, the inwardly projecting latch stud 36 at the end of arm 30*h* of the bell crank 30 engages the upwardly sloping top cam surface 41 near the point of latch block 40 and slides upwardly along it, and finally drops into the upper end of the channel 43 and into abutting contact with the upper end portion of the outer wall 43*a* of channel 43, as in FIG. 5 and is caused to remain there until the user slightly releases his handle closing grip. When this handle closing grip is released, the tension in spring 33 actuates lever arm 30*h* downwardly and the stud 36 is moved into the seat 43*s* between the ends of the channel, as in FIG. 4 and the jaws are held against release. The operator may then lift or pull the comb frame upwardly from the hive and the handle grip will hold just as long as no "squeezing" or latch releasing pressure is applied to handle parts 10*h*—10*h*'.

When it is desired to release the handle grip jaws 10*j*—16*j* from the frame rail 45, the user merely grips the parts 10*h*—10*h*' in one hand and presses them together. This releases the stud 36 from its FIG. 4 seated or holding position in the medial part of the curved channel 43, and permits the tension of coil spring 33 to rock the bell crank arm 30*h* downwardly and thus move stud 36 from the lower end of the channel 43, as in FIG. 6. Then, when the user releases this squeezing grip slightly, the tension in springs 21 moves the handle members apart and releases the paired jaw members 10*j* and 16*j* from the rail, and the tension of springs 20 returns the parts to their FIG. 3 open positions.

In the present illustrations, a latch 30 has been shown only at one end of the grip but it is to be understood that, while one may suffice, another could be applied to the other end to insure greater safety. It is also to be understood that handle members 10—10' with pivotally hinged legs at one end only might be successfully employed, if such is desired or is sufficient for any particular use, and these equipped with a single latch device. Such could be used quite satisfactorily where weight to be lifted is light.

In FIG. 8, I have illustrated an alternative form of device embodying the features of the present invention therein. In this view, which shows the device only in end elevation, paired coextensive leg members 110—110' are shown to be equipped at their lower ends with coacting jaws 111—111' for reception of an object such as the bar 45, between them. Across their upper ends these legs are joined by an upwardly arched integral resilient portion 112 within which a leaf spring 113 is applied and which yieldingly urges the jaws apart. At a distance slightly above the jaws the legs are joined by a coil spring 114 that operates to pull the legs and jaws toward each other for clamping against an object such as the part 45, placed between them. This coil spring 114 is attached at one end as at 115 to the leg 110 and at its other end is attached, at 115', to the lower end of a jaw clamping lever 116 that extends upwardly along leg 110' and is pivoted thereto near its lower end as at 118 for limited inward and outward movement. When the device is to be applied, the lever 116 is permitted to swing to its outer position as shown. This releases tension in coil spring 114 and allows the spring 113 as applied between the upper ends of the joined legs to spread the jaw portions apart for their application to the part 45. Then the lever 116 is swung inwardly to its FIG. 9 position. This lever action places spring 114 under heavy tension and it then operates to pull the jaws together with clamping action against the bar 45.

At its upper end the lever 16 is equipped with a slidably releasable latch 120 adapted to lockingly engage with a projecting part 121 fixed on the opposite handle thus to secure the jaws clamped against the bar. Release of the latch, releases the lever 116 and its outward swing releases the jaws from the object 45. The projecting portion 121 acts to prevent the squeezing of the upper parts of legs 110—110' together.

Attention is now directed to various refinements both in the device of FIG. 1 and that of FIG. 8, which will now be described.

First, attention is directed to the application of studs as at 50 in FIGS. 3 and 4 to the leg portions 10*m* to act as limiting stops in the spreading or opening apart of the two handle members 10 and 10'. Also, as has been shown in FIG. 4, studs 52 are applied to the arms 16*a* of the members 16 to engage the top edges of parts 10*m* to limit the opening pivotal action of the jaws 16*j*. These studs are applied in like manner to both ends of the assembled handle members.

It is further to be observed in FIGS. 3 and 4 that the paired jaws are formed with slightly projecting, rounded ribs or corrugations 55 horizontally across their inside surfaces to afford a more secure lifting hold on objects that are gripped between the jaws and that the lower horizontal inner edge surfaces of the jaws terminate in slightly inwardly directed toes, as at 58, to give better holding support. Further, it has been shown in FIGS. 1, 3, 4 and 8 that the extent to which the paired jaws can be applied over an object, such as the rail 45, is limited by shoulders 60 that are formed at the lower end portions of the flattened parts 10*m* and project inwardly from the jaws.

The sloping of the bottom surfaces of parts 58 acts to help guide the placement of the jaws over an object.

Further modifications in design might be made in proportion of parts, form and positioning of jaws, use of latches and springs without departing from the spirit of the invention and materials used in the manufacture of such devices can be varied or changed to suit conditions or meet requirements.

What I claim as new is:

1. A releasable handle of the character described com-

prising first and a second hand hold portion with downwardly directed legs, pivot means joining said legs for the opening apart and closing together of said hand hold portion, the leg of one of said hand hold portions being extended beyond the pivot means which joins the legs and formed into a jaw, a jaw lever pivotally mounted between its ends by said pivot means and comprising a lever arm at one end thereof and a jaw at its other end disposed in opposed relationship to the first mentioned jaw and a spring so connected to said lever arm and to the opposite hand hold portion, as to be placed under tension by the closing of said hand hold portions toward each other, thus to actuate the jaws into gripping contact with an object placed between them, and to be relieved of tension with the opening apart of said hand hold portions.

2. A releasable handle of the character described comprising horizontally extending first and second hand hold portions equipped with downwardly directed legs, pivot members joining said legs to permit the opening apart and closing together of said hand hold portions; the legs of said first hand hold portion extending below the place of pivotal connection with the legs of the companion hand hold member and each formed into a jaw, jaw levers mounted pivotally by said pivot members and each providing, at one end, a lever arm and at its other end, a jaw disposed in opposed relationship to the corresponding jaw of the first mentioned jaws for cooperatively gripping an object disposed between them, coiled springs attached at their opposite ends, respectively, to said jaw-forming lever arms and to said first of the hand hold members; said coiled springs being placed under tension incident to the closing together action of the hand hold portions to apply jaw closing movement to the jaw levers and to be relieved of tension incident to opening apart of the hand hold portions.

3. The handle of claim 2 including another coiled spring, attached at its opposite ends, respectively, under tension to the jaw lever and to the corresponding leg of the handle member at that side to move said hand hold portions apart, and to open the coacting jaws apart, with the opening of said hand hold portions.

4. A releasable handle of the character described comprising a pair of horizontally disposed and parallel hand hold members with downwardly directed leg portions at their opposite ends, pivot means joining the legs at corresponding ends of said hand hold members for their opening and closing action; the legs of one of the hand hold members being extended beyond the pivot means and terminating as jaws, jaw-forming levers of bell crank form mounted by said pivot means; each jaw-forming lever comprising a jaw portion at one end thereof, disposed in paired relationship with one of the jaws first mentioned, for the gripping of an object between them, and a lever arm at its other end for actuation of its jaw portion, coiled springs attached at their ends to said lever arms and to the opposedly disposed hand hold member; said spring being placed under tension, to apply closing force to the bell crank jaws with the closing together of the hand hold members and relieved of said closing force with their opening apart.

5. The handle of claim 4 wherein a latch lever is pivotally mounted on one of said hand hold members and

a latch block is fixedly mounted on the opposite member; said lever and block being movable together with the closing action of said hand hold members to engage in a releasably latched connection, thus to retain the coacting jaws in gripping contact with an object against which they have been closed.

6. The combination recited in claim 5 wherein spring means acts against said pivoted latch lever to urge its swinging end to a neutral position, between upper and lower limits of movement, and wherein said latch block is formed with an upper cam surface and with a lower cam surface, merging into a point directed toward the levers and with a channel extended across the block between said cam surfaces, a latch pin extended laterally from the swinging end of the latch lever to ride on the upper cam surface of the block with the initial closing of the hand hold members together and to drop into said channel to latch said hand hold members in a closed together relationship.

7. The combination recited in claim 6 wherein said channel as provided across said latch block is formed between its ends with a seat into which said latch pin will be received to yieldingly retain the latch lever against release from latching position, and from which seat it will be unseated for movement from the lower end of the channel incident to a further closing together movement of said hand hold portions.

8. The device of claim 7 wherein said latch lever is of bell crank form and has a latch arm and a lever arm, said latch arm being held yieldingly in neutral position by a coil spring attached under tension, at its ends, to the lever arm and to the leg of the handle member on which it is pivotally mounted.

9. A handle of the character described comprising a pair of horizontally disposed and parallel hand hold members, each with downwardly directed leg members at its opposite ends, pivot means joining corresponding legs of said paired hand hold members for the opening apart and closing together of said hand hold members; the leg members of one hand hold member extending below the points of pivotal connection of said legs and each terminating in a jaw, jaw-forming levers pivotally mounted by said pivot means in cooperating relationship to the jaws of the leg members of said one hand hold member, springs connected with said jaw-forming levers and with the legs of the opposite hand hold member and adapted to be placed under tension with the closing together of said hand hold members to actuate cooperatively related jaws into gripping contact with an object placed between them, and means applied to said legs for limiting the opening action of the jaws with the opening of the hand hold members.

10. The handle of claim 9 wherein the cooperating jaws are equipped with shoulders positioned to engage with objects placed between the jaws to limit the extent of application of said jaws thereto and wherein the object gripping surfaces of the jaws are transversely corrugated.

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