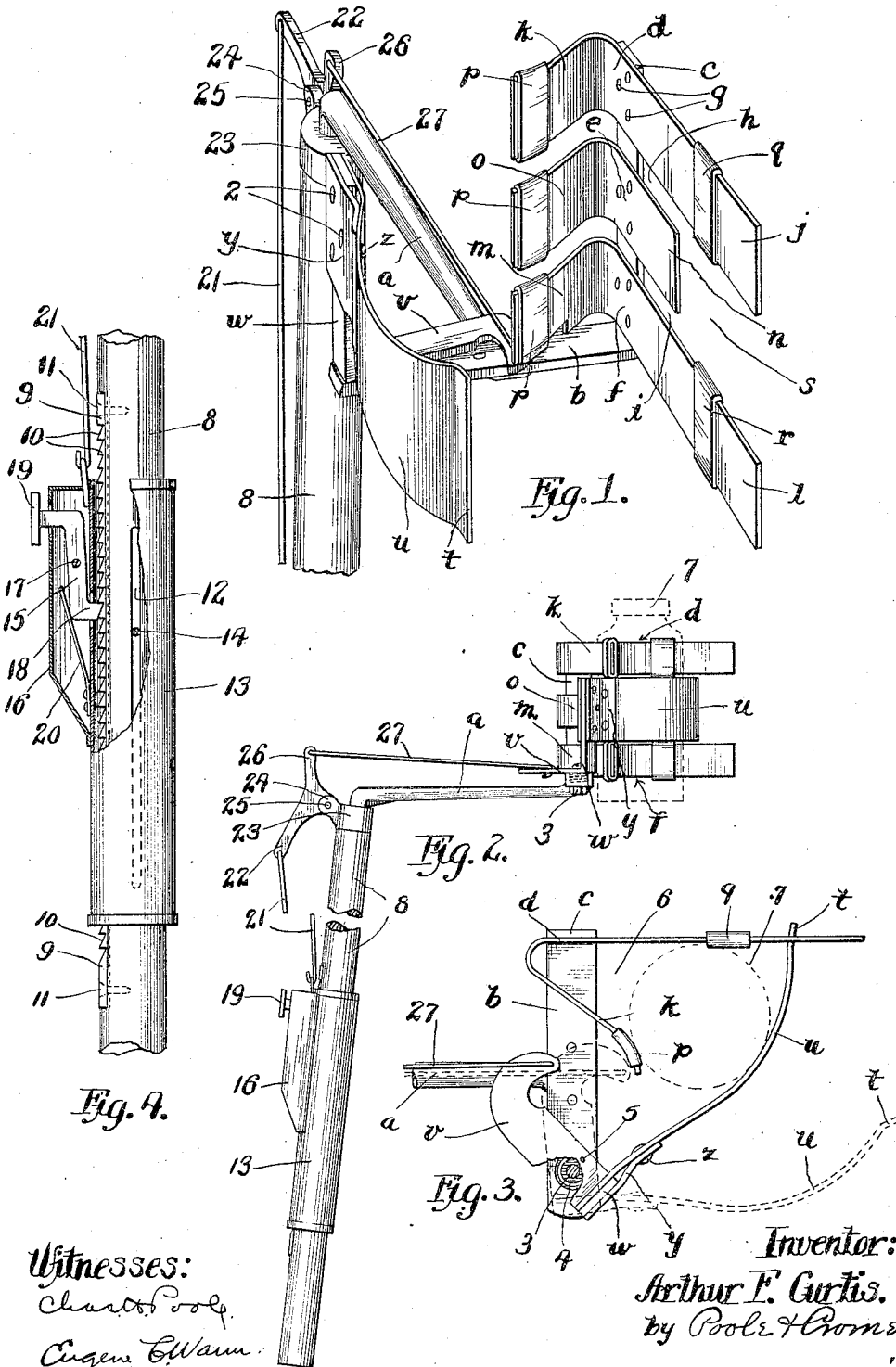


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CLASPING AND LIFTING DEVICE.
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UNITED STATES PATENT OFFICE.

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CLASPING AND LIFTING DEVICE.

1,047,505.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, ARTHUR F. CURTIS, a citizen of the United States, and a resident of Elgin, in the county of Kane and State of Illinois, have invented certain new and useful Improvements in Clasping and Lifting Devices; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to that class of clasping and lifting devices adapted to be used for reaching and clasping jars, cans or other objects and lifting the same to or from any desired position, more especially an elevated position upon a shelf or other support, and more particularly to clasping mechanisms adapted to enable glass jars, fruit or other objects of varying sizes and requiring careful handling to be clasped, or detached, released and handled in such a manner as to prevent injury thereto.

The principal object of the invention is to provide a simple, economical and efficient clasping and lifting mechanism.

My improved clasping and lifting mechanism by reason of its construction and mode of operation may properly be designated as a "mechanical hand".

A further object of the invention is to provide a clasping and lifting mechanism adapted to be used for clasping and lifting jars, cans or other objects, and particularly objects of fragile construction or which are easily injured in handling, and adapted to tightly clasp and closely conform to or engage objects of varying shapes, sizes and dimensions in such a manner as to enable the same to be lifted to or from any position and particularly an elevated position on a shelf or other support and deposited and released in any desired position without danger of injuring the objects to be handled thereby.

Other and further objects of the invention will appear from an examination of the accompanying drawings and from the following description and claims.

The invention consists in the features, combinations and details of construction herein described and claimed.

In the accompanying drawings Figure 1

is a perspective view of a clasping and lifting device constructed in accordance with my invention and improvements; Fig. 2, a view in side elevation of the same with parts of the handle broken away and showing the device in closed position and in clasping engagement with a jar or can to be lifted thereby; Fig. 3, an enlarged plan view of the clasping and lifting mechanism shown in Fig. 2, showing the device in closed position in full lines and the pivoted clamping member or jaw in open position in broken lines; and Fig. 4, an enlarged detail view of the pawl and ratchet mechanism or means for operating the pivoted clamping member and showing the same in closed position or clasping engagement with the object to be operated upon.

In constructing a clasping and lifting mechanism in accordance with my improvements I provide an arm or bracket *a*, formed preferably of metal, and having a transverse frame or supporting member *b* supported thereon, or forming transverse arms or projecting portions thereof. An upright or upwardly projecting frame portion *c* is mounted upon one end of the transverse frame member *b* or formed integral therewith, and upon this upright frame member or portion *c* is mounted a plurality of angular frame members *d*, *e* and *f* arranged one above the other or in superposed relation, and secured to the frame member *c* by means of rivets *g*, or other suitable means, and forming a jaw having side frame and end frame portions disposed at an angle with respect to each other. These frame or jaw members *d*, *e* and *f* are made preferably of flexible or resilient material, such as soft sheet steel, and are arranged preferably in position to provide spaces *h* and *i* therebetween. The top member *d* comprises a longitudinal side finger or side frame member *j* and a preferably integral transverse or end frame member *k* which extend at an angle and preferably in oblique relation to each other. The bottom frame member *f* is, by preference, arranged parallel with the top member *d* and comprises a longitudinal side finger or side frame member *l* beneath the top side finger *j* and a transverse or end frame member *m* below the level of and parallel with the top frame member *k*. The inner or intermediate finger or frame mem-

ber *e*—of which there may be any desired number—comprises a longitudinal side finger or side frame member *n* between and in parallel relation to and preferably shorter than said upper and lower longitudinal fingers *l* and *j*, and a transverse or end frame portion *o* preferably integral with the frame portion *n* and extending between and in parallel relation to the upper and lower transverse or end frame portions *k* and *m*. The transverse or end frame portions *k*, *o* and *m* are all flexible and extend transversely with respect to the arm *a*, and inward and forward, preferably in oblique relation to the longitudinal side fingers or side frame members *j*, *n* and *l*, and, by preference, are each slightly curved at or near their inwardly projecting ends.

Cushion members in the form of rings or bands *p* of soft rubber are slipped upon the inner ends of these metallic fingers or frame members *k*, *o* and *m*, and similar cushion members or bands *q* and *r* of compressible material are mounted upon the relatively long side frame members or fingers *j* and *l*, respectively, adjacent to the forward ends of said metallic fingers. The cushioning bands *q* and *r* are located preferably endwise beyond the forward end of the inner finger *n*, so that a space *s* is provided between the forwardly projecting end portions of the fingers *j* and *l* and between the cushions *q* and *r* on said fingers, adapted to admit the swinging end portion *t* of a pivoted clamping member or jaw *u*, which is pivotally mounted upon a suitable support, preferably the opposite end of the transverse frame member *b* from that on which the fingers *d*, *e* and *f* are mounted.

The pivoted clamping member or movable jaw *u* is provided at its pivoted end with a lever arm *v* having an upwardly extending, preferably integral portion *w* secured to the member *u* by means of a plate *y* and rivets 2, which extend through the parts *y*, *w* and *u*, the plate *y* being secured to the member *u* by means of rivets *z* (see Figs. 1 and 3). An upright pivot pin 3 mounted in the end portion of the transverse frame member *b* extends upward and through the lever *v* and forms a pivotal support for said lever and for the clamping member or pivoted jaw *u* secured to said lever. The lever arm *v* extends inward horizontally over the transverse frame member *b* and at an angle with respect to the jaw *u*, and the bottom surface of the lever arm *v* is in sliding engagement with the top surface of the transverse member *b* which forms a bearing for the lever. The jaw *u* is thus braced in an efficient manner by the sliding engaging flat surfaces of the lever arm *v* and transverse frame member *b*. The lever and jaw are thus supported with a sufficient degree of rigidity to enable the pivoted jaw and flexible fingers to se-

curely clasp and hold a jar, can or other object therebetween. A spring 4, shown in Fig. 3, is secured at one end of the supporting frame member *b* and at its opposite end, by means of a pin 5, to the lever arm *v*, and is adapted to yieldingly hold the clamping member *u* in open or extended position, as indicated in broken lines in Fig. 3. The clamping member or pivoted jaw *u* is preferably curved outwardly throughout its longitudinal central portion, as indicated in Fig. 3, so as to provide a concave inner surface portion adapted to engage and securely clasp objects of various sizes, shapes and dimensions, such as jars, cans, lamp chimneys or other objects to be clasped and lifted or handled by means of the device. The end frame portion formed by the transversely and inwardly extending portions *k*, *o* and *m* extend forward of the inner end of the lever arm *v* so that the latter has ample room in which to operate forward and backward without passing forward beyond the said end frame portion so as to interfere with the object to be clasped between the fingers and pivoted clamping member or jaw, and a triangular or V-shaped space 6 is thus provided between the end frame members and side fingers which is adapted to enable objects, such as jars or cans 7 of varying sizes to be pressed inward to a greater or less extent, according to their sizes, into said V-shaped space or between the end frame members *k*, *o* and *m* and the longitudinal or side frame members *j*, *n* and *l*, as indicated in Fig. 3.

In order to provide means for operating the pivoted clamping jaw *u* and for holding it securely in clamping or clamping engagement with an object to be operated upon, and in such a manner as to enable such object to be readily released or deposited in proper position and without danger of injury to the objects to be handled, a handle 8, which may be of any desired length according to the uses to which it is intended to be applied, is provided and mounted in supporting engagement with the bracket or arm *a*, and is preferably so connected with the arm *a* as to extend downward and at an angle with respect thereto, as indicated in Fig. 2. A toothed rack 9 provided with a series of ratchet teeth 10, is mounted upon and in position to extend longitudinally of the handle 8 and is secured to the latter by means of screws 11 or by similar suitable securing means, as shown in Fig. 4. The handle 8 is provided with a longitudinal slot 12, and a sleeve 13 is slidably mounted upon the handle 8 and provided with a guiding pin 14 mounted in said sleeve and adapted to extend through the slot 12, so as to guide the sleeve in its movements longitudinally of the handle. The pin 14 and slot 12 may be arranged in such position as to

limit the upward movement of the sleeve, and permit the downward movement of the same to any desired position. A pawl 15 is pivotally mounted in a laterally projecting portion 16 of the sleeve by means of a pivot pin 17 and is provided with an inwardly projecting end portion 18 adapted to engage the teeth of the rack 9,—the opposite end of the pawl being provided with an outwardly projecting end portion or thumb piece 19 on the outside of the sleeve and in position to be readily operated by the thumb of the operator.

A spring 20 mounted on the inside of the laterally projecting portion 16 of the sleeve engages the pawl and is adapted to yieldingly hold the latter in engagement with the teeth of the rack, as shown in Fig. 4. The sleeve 13 is operatively connected with the lever arm *v* and thereby with the pivoted jaw *u*. A link or rod 21 is secured at its lower end to the sleeve, the opposite end of said rod being connected with the lower lever arm 22 of a bell crank lever, comprising lever arms 22 and 26. This bell crank lever is mounted upon the upper portion of the arm 8 or at the end of bracket *a* by means of a collar 23 having lateral projections 24 between which the bell crank lever is pivotally secured by means of a pivot pin 25. The upwardly extending lever arm 26 of the bell crank lever is preferably integral with the arm 22 already described, and is operatively connected with the lever arm *v* on the pivoted jaw *u* by means of a connecting rod 27, which is connected at one end with the inner end of the lever arm *v* and at its opposite end with said upwardly projecting lever arm 26.

By the above arrangement it will be readily seen by those skilled in the art, that the longitudinal flexible side fingers or side frame members *j*, *n* and *l* are adapted to be inserted with facility between jars, cans or similar objects upon a shelf, and that when so inserted the pivoted jaw *u* is adapted to be swung into clamping or clamping engagement with the object to be operated upon, by pulling downward upon the sleeve 13 until the object is tightly clasped between the pivoted jaw *u* and the flexible side fingers and end frame portions of the fixed jaw. The pawl and ratchet mechanism is adapted to securely hold the sleeve 13 in any position to which it is adjusted in moving the clamping member *u* into clamping engagement with the objects to be supported or clamped, and the jaw *u* is thus securely locked in clamping engagement with the object. In order to release the object, thus clasped by the device, it is only necessary to press inward upon the pawl 15, thus permitting the pivoted jaw or clamping member *u* to be automatically swung outward or to releasing position, as indicated in

broken lines in Fig. 3 by means of the spring 4 above described.

The upper side finger *j* and lower side finger *l* being of greater length than the inner or intermediate finger *n* provides a space *s* between the end portions of the fingers *j* and *l* adapted to admit the end of the jaw *u*, as indicated in Fig. 3, and the device is thus adapted to clasp and securely hold between the pivoted jaw and the yielding fixed jaw members objects of varying sizes, shapes and dimensions, and the cushioning members or compressible bands *p*, *q* and *r* enable the objects to be securely supported with a minimum degree of force applied.

I claim—

1. A clamping and lifting mechanism comprising in its construction a supporting arm, a jaw mounted upon said arm and comprising side and end frame portions extending at an oblique angle with respect to each other, and a pivoted clamping member pivotally mounted on the arm adjacent to the end frame portion of said jaw and adapted to extend across the space between the end frame and side frame portions of the jaw.

2. A clamping and lifting mechanism comprising in its construction a supporting arm, a jaw mounted upon said arm and comprising in its construction side and end frame portions extending at an oblique angle with respect to each other, and forming a V-shaped space therebetween, a pivoted clamping member pivotally mounted adjacent to the end frame portion of said jaw and adapted to extend across the space between the side and end frame portions of said jaw, and means for operating the pivoted clamping member.

3. A clamping and lifting mechanism comprising in its construction a supporting arm, a jaw mounted upon said arm and comprising superposed side frame portions having a space between the forward ends thereof and end frame portions extending at an angle with respect to the side frame portions, and a pivoted clamping member pivotally mounted adjacent to the end frame portion of said jaw, and having a forward swinging end portion adapted to extend between the forward ends of said superposed side frame members.

4. A clamping and lifting mechanism comprising in its construction a supporting arm, a jaw mounted upon said arm and comprising in its construction a side frame portion and an end frame portion extending at an angle with respect to each other, and having a space between the forward ends thereof, a pivoted clamping member pivotally mounted adjacent to the end frame portion of said jaw and adapted to extend across the space between the forward ends of the

side and end frame portions of said jaw, and lever mechanism connected with the pivoted clamping member, for operating the same.

5 5. A clasp and lifting mechanism comprising in its construction a supporting arm, a jaw mounted upon said arm and comprising a side frame portion and an end frame portion extending at an angle with respect to each other and having a space between
10 the forward ends thereof, a pivoted clamping member pivotally mounted adjacent to the end frame portion of said jaw and adapted to extend across the space between the forward ends of said side and end frame
15 portions of said jaw, a lever arm secured to said pivoted clamping member and extending back of the end frame portion of said jaw, and means for operating said lever arm and thereby the pivoted clamping member.

20 6. A clasp and lifting mechanism comprising in its construction a supporting arm, a jaw mounted upon said arm and comprising flexible side and end frame portions extending at an angle with respect to each
25 other and having a space between the forward ends thereof, and a pivoted clamping member pivotally mounted on the arm adjacent to the end frame portion of said jaw and adapted to extend across the space between the forward ends of the flexible end
30 and side frame portions of the jaw.

7. A clasp and lifting mechanism comprising in its construction a supporting arm, a jaw mounted upon said arm and having
35 side and end frame portions extending at an angle with respect to each other and provided with a space between the forward ends thereof, a pivoted clamping member pivotally mounted adjacent to the end frame
40 portion of said jaw and having a forward end portion movable toward and from the side frame portion of the jaw and adapted to extend across the space between said side and end frame portions of the jaw, a spring
45 operatively connected with the pivoted clamping member and adapted to yieldingly hold the same in releasing position, and means for moving the pivoted clamping member to closed position.

50 8. A clasp and lifting mechanism comprising in its construction a supporting arm, a jaw mounted upon said arm and having side and end frame portions extending at an angle with respect to each other and provided
55 with a space between the forward ends thereof, a pivoted clamping member pivotally mounted adjacent to the end frame portion of said jaw and having a forward end portion movable toward and from the side frame portion of the jaw and adapted
60 to extend across the space between said side and end frame portions of the jaw, a spring operatively connected with the pivoted clamping member and adapted to yieldingly
65 hold the same in releasing position, means

for moving the pivoted clamping member to closed position, and means for securing the pivoted clamping member in clamping engagement with an object to be clasped thereby.

9. A clasp and lifting mechanism comprising in its construction a supporting arm, a jaw mounted upon said arm and having side and end frame portions extending at an angle with respect to each other and provided with a space between the forward
75 ends thereof, a pivoted clamping member pivotally mounted adjacent to the end frame portion of said jaw and having a forward end portion movable toward and from the side frame portion of the jaw and adapted to extend across the space between said side and end frame portions of the jaw, means
80 for moving the pivoted clamping member to closed position, and means for locking said pivoted clamping member in closed position in clamping engagement with an object to be operated upon.

10. A clasp and lifting mechanism comprising in its construction a supporting arm, a jaw mounted upon said arm and having side and end frame portions extending at an angle with respect to each other and provided with a space between the forward
90 ends thereof, a pivoted clamping member pivotally mounted adjacent to the end frame portion of said jaw and having a forward end portion movable toward and from the side frame portion of the jaw and adapted to extend across the space between said side
95 and end frame portions of the jaw, a lever arm connected with the pivoted end of said pivoted clamping member, a sleeve slidably mounted upon a suitable support, and means for connecting the sleeve with said lever
100 arm.

11. A clasp and lifting mechanism comprising in its construction a supporting arm, a jaw mounted upon said arm and having side and end frame
110 portions extending at an angle with respect to each other and provided with a space between the forward ends thereof, a pivoted clamping member pivotally mounted adjacent to the end frame portion of said jaw and having a forward end portion movable toward and from the side frame portion of the jaw and adapted to extend across the space between said side and end frame portions of the jaw, a lever arm connected with
120 the pivoted end of said pivoted clamping member, a sleeve slidably mounted upon a suitable support, means for connecting the sleeve with said lever arm, and means for locking the pivoted clamping member in closed position in clamping engagement
125 with an object to be clamped by said mechanism.

12. A clasp and lifting mechanism comprising in its construction a supporting arm, 130

a jaw mounted upon said arm and having flexible side and end frame portions extending at an angle with respect to each other and provided with a space between the forward ends thereof, a pivoted clamping member pivotally mounted adjacent to the end frame portion of said jaw and having a forward end portion movable toward and from the side frame portion of the jaw and adapted to extend across the space between the forward ends of said side and end frame portions of the jaw, a lever arm connected with the pivoted end of said pivoted clamping member, a sleeve slidably mounted upon the supporting arm, means for connecting the sleeve with said lever arm, and pawl and ratchet mechanism operatively connected with the sleeve and adapted to secure the sleeve in any position to which it is adjusted, and thereby to secure the pivoted clamping member in clamping engagement with an object to be clamped by said mechanism.

13. A claspings and lifting mechanism comprising in its construction a supporting arm, a jaw mounted upon said arm and having flexible side and end frame portions extending at an angle with respect to each other and provided with a space between the forward ends thereof, a pivoted clamping member pivotally mounted adjacent to the end frame portion of said jaw and movable toward and from the side frame portion of the jaw and adapted to extend across the space between the forward ends of said side and end frame portions of the jaw, a spring operatively connected with the pivoted clamping member adapted to yieldingly hold the same in open position, a lever upon said clamping member, and means for operating said lever to move the pivoted clamping member to closed position.

14. A claspings and lifting mechanism comprising in its construction a supporting arm, a jaw mounted upon said arm and comprising superposed side frame members provided with a space therebetween and an end frame portion extending at an oblique angle with respect to said side frame members, and provided with a space between the forward ends of the side frame members and end frame portion of the jaw, a pivoted clamping member pivotally mounted adjacent to the end frame portion of said jaw and having a forward end portion adapted to extend between the forward ends of the superposed side frame members when in closed position, and means for moving the pivoted clamping member to closed position.

15. A claspings and lifting mechanism comprising in its construction a supporting arm, a jaw mounted upon said arm and having side and end frame portions extending at an angle with respect to each other and provided with a space between the forward

ends thereof, cushion members mounted upon the side and end frame portions of said jaw, and a pivoted clamping member pivotally mounted adjacent to the end frame portion of said jaw and having a forward end portion movable toward and from the side frame portion of the jaw and adapted to extend across the space between said side and end frame portions of the jaw.

16. A claspings and lifting mechanism comprising in its construction a supporting arm, a jaw mounted upon said arm and having side and end frame portions extending at an angle with respect to each other and provided with a space between the forward ends thereof, cushion members mounted upon the side and end frame portions of said jaw, a pivoted clamping member pivotally mounted adjacent to the end frame portion of said jaw and having a forward end portion movable toward and from the side frame portion of the jaw and adapted to extend across the space between said side and end frame portions of the jaw, a lever arm connected with the pivoted end of said pivoted clamping member, a sleeve slidably mounted upon the supporting arm, means for connecting the sleeve with said lever arm, and pawl and ratchet mechanism operatively connected with the sleeve and adapted to secure the sleeve in any position to which it is adjusted.

17. A claspings and lifting mechanism comprising in its construction a supporting arm, a jaw mounted upon said arm and having side and end frame portions extending at an angle with respect to each other and provided with a space between the forward ends thereof, cushion members mounted upon the side and end frame portions of said jaw, a pivoted clamping member pivotally mounted adjacent to the end frame portion of said jaw and having a forward end portion movable toward and from the side frame portion of the jaw and adapted to extend across the space between said side and end frame portions of the jaw, a spring operatively connected with the pivoted clamping member adapted to yieldingly hold the same in open position, a lever upon said clamping member, and means for operating said lever to move the pivoted clamping member to closed position.

18. A claspings and lifting mechanism comprising in its construction a supporting arm, a jaw mounted upon said arm and having side and end frame portions extending at an angle with respect to each other and provided with a space between the forward ends thereof, cushion members mounted upon the side and end frame portions of said jaw, a pivoted clamping member pivotally mounted adjacent to the end frame portion of said jaw and having a forward end portion movable toward and from the side

frame portion of the jaw and adapted to extend across the space between said side and end frame portions of the jaw, a spring operatively connected with the pivoted clamping member adapted to yieldingly hold the same in open position, a lever upon said clamping member, means for operating said lever to move the pivoted clamping member to closed position, and means for securing the lever in any position to which it is adjusted.

19. A clamping and lifting mechanism comprising in its construction a supporting arm, a jaw mounted upon said arm and having side and end frame portions extending at an angle with respect to each other and provided with a space between the forward ends thereof, a pivoted clamping member pivotally mounted adjacent to the end frame portion of said jaw and having a forward end portion movable toward and from the side frame portion of the jaw and adapted to extend across the space between the for-

ward ends of said side and end frame portions of the jaw, a lever arm upon said clamping member, a handle for said supporting arm, a sleeve slidably mounted upon said handle, a pivoted bell crank located intermediate the sleeve and said lever arm, a connecting rod connected with said lever arm of the pivoted clamping member and with one of the arms of said bell crank, a connecting rod connected with the other arm of said bell crank and with said sleeve, and pawl and ratchet mechanism operatively connected with said sleeve and adapted to secure the same in any position to which it is adjusted.

In testimony that I claim the foregoing as my invention I affix my signature in the presence of two witnesses, this 10th day of August A. D. 1912.

ARTHUR F. CURTIS.

Witnesses:

ALBERT H. BATES,
HERMAN L. JEANNAIRE.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."