Oct. 17, 1939. T. W. C. ELVING 2,176,333

TONGS

Filed April 4, 1938

Fig. 1.

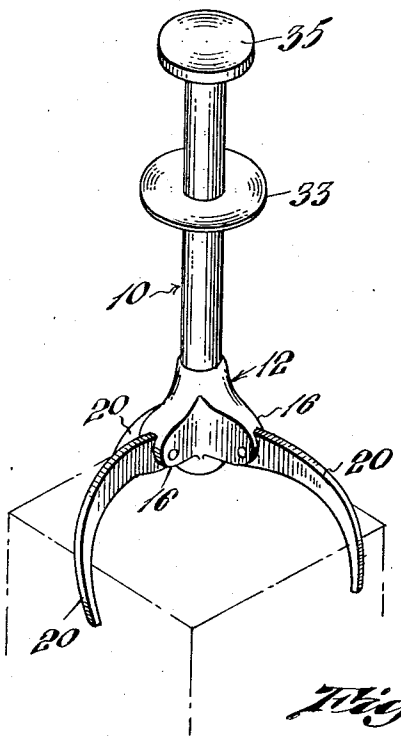


Fig. 2.

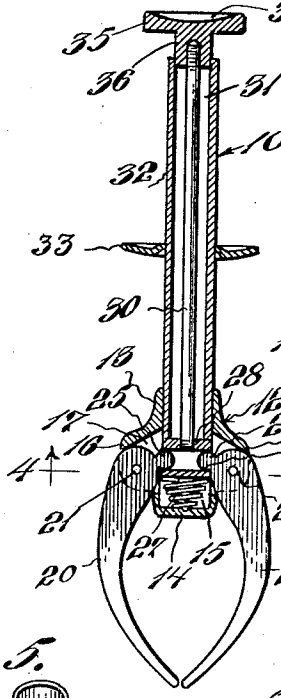


Fig. 3.

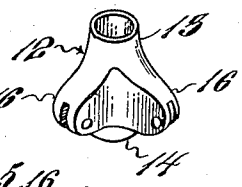


Fig. 7.

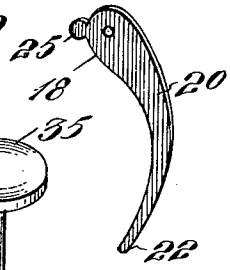


Fig. 5.



Fig. 6.



Fig. 4.

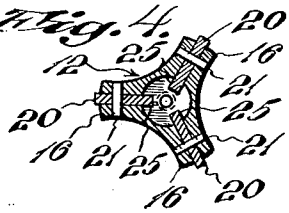


Fig. 9.



Fig. 8.



Fig. 10.



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TONGS

Theodore W. C. Elving, Providence, R. I.

Application April 4, 1938, Serial No. 199,858

8 Claims. (Cl. 294—115)

This invention relates to improvements in tongs, and in particular to miniature tongs adapted for use in picking up and transporting various bodies of small size, such as ice cubes, sugar lumps or other articles; and has for one of its objects the elimination of exposed structure of the movable actuating mechanism for the tong jaws.

Another object is the protection of the moving parts of the actuating mechanism of the tongs from injury, and to provide a device capable of operation without interference by foreign materials becoming wedged or lodged between the movable parts of the actuating mechanism.

Another object of the invention is to provide a tongue construction of the plunger operated type which is simple and reliable in construction, in which the arrangement of the mechanism is such as to eliminate the relatively long spring that normally maintained the pivotally mounted tong members in closed position as has heretofore characterized many of the prior tong constructions.

Another object of the invention is the provision in tongs of the above described type of novel features of construction wherein the operating structure may be made more compact than that employed in previous tong structures of this class.

Another object of the invention is the provision of a means on the operating member for the movable prongs wherein a better fit is had by the contacting surface of the thumb of the person using the tongs.

With these and other objects in view, the invention consists of certain novel features of construction, as will be more fully described, and particularly pointed out in the appended claims.

In the accompanying drawing:

Fig. 1 is a perspective view of a tongs embodying my invention showing the jaw members in open position and indicating the manner in which they provide gripping engagement with an ice cube;

Fig. 2 is a longitudinal sectional view of the tongs shown in Fig. 1 taken on lines lying in a pair of intersecting planes each containing a jaw member and passing through the longitudinal axis of the tongs, with the jaws in closed position;

Fig. 3 is a perspective view of the head member on which are pivotally mounted the tong jaws;

Fig. 4 is a transverse sectional view taken on the line 4—4 of Fig. 2 looking in the direction of the arrows;

Fig. 5 is a perspective view of the tubular body member of the tongs;

Fig. 6 is a perspective view of the operating plunger for opening the jaws;

Fig. 7 is a perspective view of one of the tong jaws;

Fig. 8 is a perspective view of the conical spring for maintaining the jaws in closed position;

Fig. 9 is a perspective view of the disk for applying pressure to urge the jaws in closed position; and

Fig. 10 is a perspective view of the plunger collar for applying manual pressure to move the jaws into open position.

In many of the tong constructions heretofore provided, it has been usual to maintain the pivotally mounted jaw members of the tongs in closed position by means of a coil spring of considerable length confined entirely within the tubular body portion of the tongs and extending in an encircling relation about the stem of the actuating member for the jaws. However, for manufacturing reasons, it is often desirable to provide a tongue structure wherein such a relatively long spring is not needed; and in order that this may be accomplished I have arranged for a shorter spring, preferably a volute or conical spring to be employed for urging the tong jaws in closed position; and I have mounted this spring in a position externally of the tubular body portion of the tongs for simultaneously urging and maintaining the jaw members of the tongs in closed position; and I have so arranged the spring that it will act in a direction to oppose and resist manual movement of the operating means for opening the jaws during use of the tongs. I have further located the jaw actuating spring in a position that is an advance position in the portion which pivotally mounts the tong jaws, in which the disposition of the spring is such that it will be coaxial with the axis of the body member and also will have a tendency to move relatively towards the same; and the following is a more detailed description of the present embodiment of this invention, illustrating the preferred means by which these advantageous results may be accomplished:

With reference to the drawing, 10 designates generally my improved tongs which are shown in Figs. 1 and 2 as consisting of a handle unit comprrising a tubular portion 32 provided with a hollow head part 12. The head comprises an upper tubular sleeve portion 13 and a bottom wall member 14, the inner surface of which is cupped outwardly to provide a recess 15. The

head 12 is provided intermediate of its ends with three outwardly extending ears 16 which are formed integrally with the head and are disposed at equally spaced positions on its circumference. The ears 16 are provided with inwardly extending slots 17 which communicate with the interior of the hollow head, and received within these slots are the upper ends 18 of the three tong jaw members 20 which are pivotally secured into position by the pivot pins 21 for rocking movement to open and closed positions. The tong jaws 20 are each of generally arcuate formation and provided with a pointed gripping end 22, as shown in Fig. 7, so that in the normally closed position of the jaws on the head 12, as shown in Fig. 2, the arcuate portions outside the head will extend outwardly beyond the same and have their pointed ends 22 inwardly curved, the tips of which terminate at a common point that is substantially coincident with the extended line of the longitudinal axis of the head 12. The upper ends 18 of the jaws 20 have the portions within the slots 17 provided with curved lugs or cam portions 25 which extend radially inwardly of the slots and into the receptacle portion of the hollow head 12, these cam portions 25 being adapted to have positive camming engagement on their underside with the top surface of a disk 26 which is mounted for sliding movement within the recess 15 of the cupped bottom wall 14, the disk 26 being urged upwardly by means of a spring 27 and pressed against portions of the undersurface of each of the cam portions 25. The spring 27 preferably comprises a conical or volute spring which is of relatively short length, and as shown in Fig. 2, is mounted on its apex in close proximity to the pivot pins 21 and in substantially axial alignment with the longitudinal axis of the hollow head 12. It is desired that the spring 27 be so constructed and have such size as to impart sufficient force to move the disk 26 upwardly to maintain the top surfaces of the cam portions 25 in abutting engagement with the bottom surface of a collar 28 carried by the lower end of a reciprocable operating stem 30 slidably mounted within the cylindrical bore 31 of the tubular portion 32, the lower end of which is secured therein in any suitable manner, such as by having tight press-fitted connection within the bore of the sleeve portion 13 of the hollow head 12. The portion 32 may be formed of a short piece of metal tubing or as a molded body, as desired. As shown in Fig. 2, the diameter of the collar 28 is greater than that of the bore 31 so that in the closed position of the jaws 20 the collar 28 will have abutting engagement with the inner end of the portion 32 which thus acts as a stop to prevent further outward movement of the stem 30 under the action of the spring 27 after manual pressure on the button is released.

Disposed intermediate of the ends of the portion 32 is a circular flange or collar 33, the underside of which is convexedly curved and adapted to be engaged at two generally diametrically opposed positions thereof by two fingers of the hand in order to form a finger hold during use of the tongs when movement of the jaws 20 is effected by downward pressure from the thumb of the user upon an operating button 35 which is secured on the threaded upper end portion of the operating stem 30 projecting for a short distance beyond the top end of the portion 32 when the tongs are in a normally closed position, as shown in Fig. 2. The button 35 is provided with a hub portion 36 which is adapted to have sliding engagement within the cylindrical bore of the tubular portion 32, while the top surface of the button preferably is formed with a concaved portion 38 adapted to enable the contacting surface of the thumb of the user to better fit the button during manipulation of the same in causing operation of the tong jaws.

It will thus be seen in accordance with the tong construction above described that regardless of whether or not the tong jaws are in open or in closed position the spring 27 will at all times act to maintain positive connection of the cam portions 25 of the jaws 20 with the collar 28 whereby the jaws 20 will be readily responsive to manual movement of the operating stem 30 when the button 35 is depressed by the thumb in operating the tongs. Furthermore, the spring 27 also tends to oppose any inward movement of the stem 30 and, in addition, applies its force in a direction along the longitudinal axis of the tongs to the underside of the disk 26 for effecting closing of the tong jaw member 15 when manual pressure on the button 35 is released, thus causing the article being held between the tong jaws 20, such as an ice cube or a lump of sugar, to be firmly gripped thereby due to the spring action, as indicated in Fig. 1.

The spread of the tong jaws in their open position may be controlled to a limited extent by threading movement of the button along the stem 30 either toward or away from the adjacent end of the portion 32 in order to position the head portion of the button 35 either a greater or lesser distance therefrom and thus permit the button and consequently the operating stem 30 to be pushed downwardly to a greater or lesser extent, as the case may be, to result in the cam portions 25 being moved simultaneously by the collar 28 through a greater or lesser arc, with consequent increased or reduced outward swing of the jaws 20, when the button 35 is depressed, thus providing an arrangement of control and adjustment for regulating the extent of spreading of the tong jaws, as desired.

The foregoing description is directed solely towards the construction illustrated, but I desire it to be understood that I reserve the privilege of resorting to all the mechanical changes to which the device is susceptible, the invention being defined and limited only by the terms of the appended claims.

I claim:

1. Tongs comprising a handle unit having jaw members pivoted thereto intermediate its ends, actuating means for manually moving said jaw members into open position, and resilient means in the lower portion of said handle unit and positioned on the opposite side of the pivots of said jaw members relative to the upper end of said handle units and arranged for acting on said jaw members in a direction for urging said jaw members into closed position.

2. Tongs comprising a handle unit having jaw members pivoted thereto intermediate its ends, actuating means for manually moving said jaw members into open position, and a coiled spring in the lower portion of said handle unit and positioned on the opposite side of the pivots of said jaw members relative to the upper end of said handle unit and arranged for acting on said jaw members in a direction for urging them into closed position.

3. Tongs comprising a handle unit provided

with a hollow head portion, jaw members pivoted to said head portion, actuating means for manually moving said jaw members into open position, and a conical spring in said head portion positioned between the pvots of said jaw members and the lower end portion of said hollow head portion and in co-axial relation with the axis of said head portion for maintaining said jaw members in closed position.

4. Tongs comprising a handle unit provided with a tubular portion and a hollow head portion, jaw members pivoted to said head portion, a reciprocable member extending into said head portion for manually moving said jaw members into open position, and a conical spring disposed in said head portion adjacent the lower end portion thereof and mounted on its apex so as to extend in co-axial relation with said tubular portion for urging said jaw members into closed position.

5. Tongs comprising a handle unit having a tubular portion, a head portion provided with a cupped end and secured at one extremity of said tubular portion, jaw members pivoted at equally spaced circumferential portions to said head intermediate said cupped end and said tubular portion, a reciprocable member within said tubular portion for manually moving said jaw members into open position, and a conical spring disposed in said cupped end and mounted with its apex resting upon the inner surface of said cupped end and arranged to extend in co-axial relation therewith for urging said jaw members into closed position.

6. Tongs comprising a handle unit having a tubular portion provided with a head portion at the other lower end thereof, jaw members pivoted to said head portion, cam portions on said jaws, an operating member slidably mounted within said tubular portion and having an abutment at its lower end extending into said head portion and simultaneously engaging the tops of said cam portions, and a spring actuated member in contact with the bottom surfaces of said cam portions for applying pressure thereto to maintain camming engagement of said abutment with respect to the tops of said cam portions and for causing the jaw members to be moved into closed position.

7. Tongs comprising a handle unit having a tubular portion provided at its lower end portion with a hollow head portion, jaw members pivoted to said head portion, cam portions on said jaws, an operating member slidably mounted within said body member having an abutment at its lower end extending into said head portion and simultaneously engaging the tops of said cam portions, a member in contact with the bottom surfaces of said cam portions, a conical spring generally co-axial with the axis of said tubular portion and positioned for applying pressure on said last-named member to maintain camming engagement of said abutment with respect to the tops of said cam portions and for causing the jaw members to be moved into closed position.

8. Tongs comprising a handle unit having a tubular portion provided at the lower end thereof with a hollow head portion, jaw members pivoted to said head portion, cam portions on said jaws, an operating member slidably mounted within said tubular portion and having an abutment at its lower end extending into said head portion and simultaneously engaging the tops of said cam portions, a member in contact with the bottom surfaces of said cam portions, a conical spring generally co-axial with the axis of said tubular portion positioned in said head portion and engaging said last-named member for applying pressure thereto to maintain camming engagement of said abutment with respect to the tops of said cam portions and for causing the jaw members to be moved into closed position.

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