July 16, 1957 T. L. JACOBS 2,799,310

NUTCRACKER

Filed Dec. 12, 1955

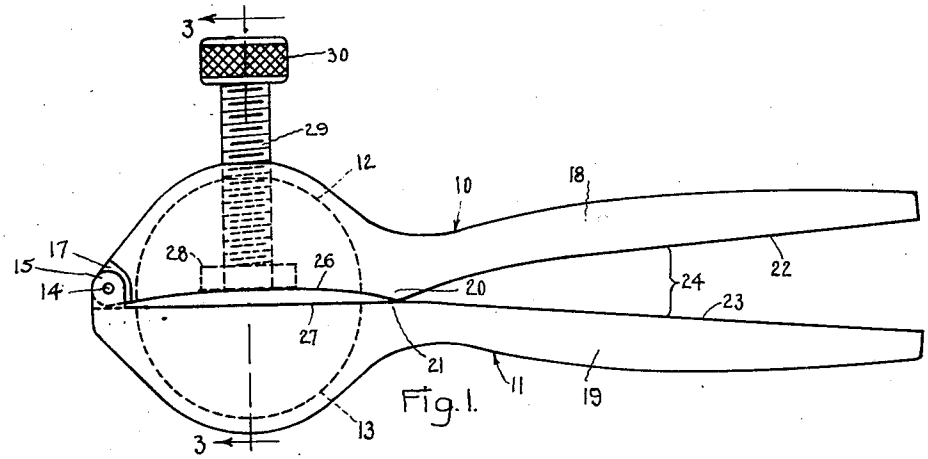


Fig. 1.

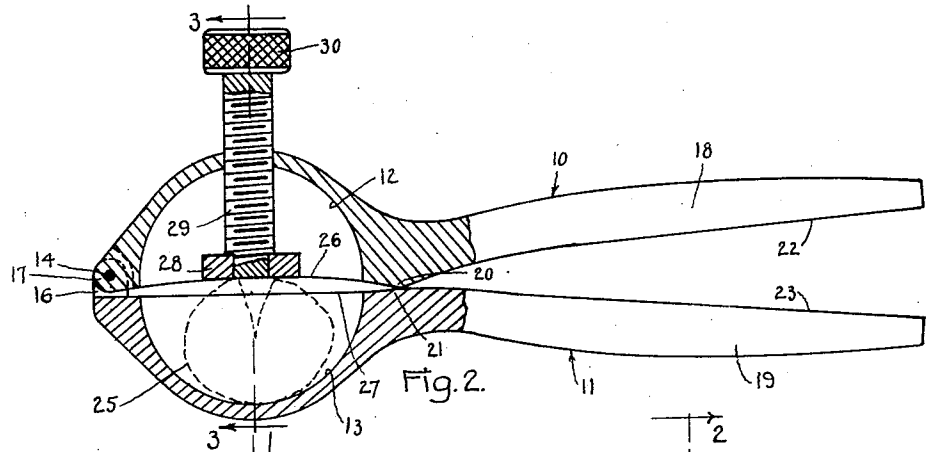


Fig. 2.

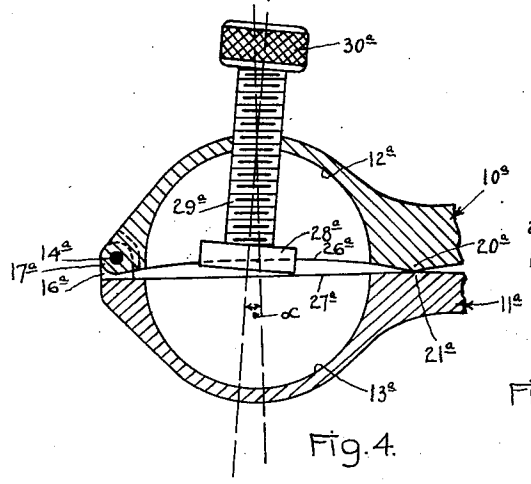


Fig. 4.

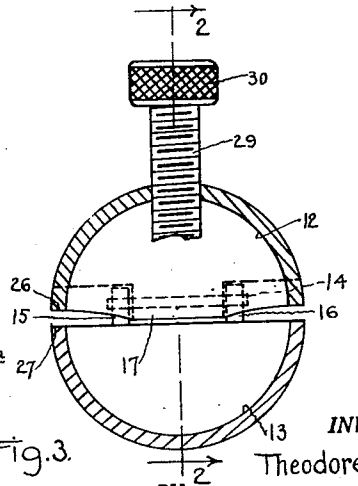


Fig. 3.

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NUTCRACKER

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1 Claim. (Cl. 146—14)

This invention relates to improvements in nut-crackers, and the like. The present improvements have to do with nut-crackers of that type in which two jaws are pivotally connected or hinged together, said jaws being provided with concave pockets which face each other and act in co-operation to hold the nut being treated, and to exert the desired compressive force against opposite portions of the nut in order to crack the nut shell. Various devices of this general type have been known for many years and widely used. However, it has been found that such devices as heretofore constructed and operated do not effectively perform their functions when various sizes of nuts are treated in them. If the nut inserted into a conventional nut-cracker of the jaw type is smaller than the intended size for such nut-cracker it may be found that when the jaws are fully rocked together the needed compressive force has not been exerted on the nut shell to crack the same; conversely, if the inserted nut is too large for the nut-cracker it will be found necessary to arrest the compressive operation produced by forcing the jaws together, before the jaws have been fully rocked towards each other; otherwise the nut may and probably will be excessively compressed. This will result in breaking the nut meat into small particles, and otherwise producing an undesirable operation. It is further to be noted that such previously known or conventional form of jaw type nut-cracker will develop its compressive force against the opposite faces of the nut at different points when nuts of different sizes are treated, since the contacts produced against the opposite faces of the nut will be located at points other than diametrically opposite to each other except in the single case of one particular size of nut for which the device has been designed.

It is also to be noted that when using such a conventional form of device as just referred to, when the cracking operation occurs before the jaws have been fully closed together there will remain a substantial size of opening between the companion jaws at the instant of cracking the nut, so that particles of the nut shell are frequently, and in fact, generally ejected through such opening, and fall to the floor or to unintended and undesired locations, making it necessary to clean up the premises after cracking the nuts.

It is further noted that such previously known and conventional forms of nut-crackers present the serious objection that the jaws may come fully together when the treated nut is under-size. If care is not exercised by the user he may be seriously pinched between the jaws at such time.

It is a prime object of the present invention to produce a construction of the nut-cracker in which the jaws are hinged together but the jaw handles are of such form and construction that when they are rocked fully together (which is the intended condition at completion of each nut-cracking operation), such rocking movement is limited by companion stopping elements or surfaces of the two jaws while said jaws are still separated far enough to avoid such pinching operation. In other words, provision is

made for limiting the rocking movement of the jaws towards each other at a point where the hand grips of the jaws are still separated sufficiently to avoid such pinching result.

Since the device is intended to always be operated to bring the jaws to such limited position of closure, I have also made provision for ensuring that various sizes of nuts will be properly and effectively compressed to ensure proper cracking thereof, irrespective of the exact size of the nut being treated. Such provision comprises an adjustable element carried by one of the jaws (preferably the upper jaw) and adjustable towards and from the other jaw through a range of adjustment sufficient to accommodate a range of nut sizes of considerable amount. The two jaws are provided with concave companion recesses, and that of the lower jaw is preferably of semi-spherical form. The nut to be treated is set into such semi-spherical lower jaw recess while the two jaws are separated, and the adjustable element is adjusted to a position such that when the jaws are forced fully together (until limited by the stopping elements or surfaces above referred to), the proper compressive action has been produced on the nut to crack its shell, leaving the nut meat substantially whole and unbroken. Since such limiting action occurs when the two jaws have been brought substantially together it follows that at such time the pocket of the lower jaw is substantially closed over by the upper jaw, thus preventing any egress of broken shell or other elements. Thus such relation of parts not only ensures proper cracking of the nut being treated, but also prevents egress of shell particles, etc., and prevents pinching of the fingers of hand of the operator.

The adjustable element to accommodate various sizes of nuts preferably comprises a screw-threaded stem extended through the upper jaw's bowl and carrying an enlarged abutment on its lower end to present a substantial nut engaging surface. The position of such abutment is thus adjusted by screwing the stem up or down with respect to the upper jaw element. Since such screw-threaded stem shifts along its own axis during such adjustment it follows that the abutment executes a like linear travel during adjustment. It also follows that the face of the abutment will lie substantially normal to the axis of such adjustment. Accordingly, when the upper jaw is rocked with respect to the lower jaw, with the abutment raised to accommodate a large nut, the engagement of such abutment with the surface of the nut, during rock of the upper jaw, will be exerted in a different direction and manner than when the abutment is in lowered position for accommodation of a smaller size of nut. In order to produce the best average condition of engagement of such abutment with nuts of various sizes I prefer to set the screw-threaded stem through the bowl of the upper jaw at an angle such that such stem slants towards the pivotal or hinge connection between the two jaws. Such modified arrangement is illustrated in the accompanying drawing. Study thereof will show that with such an arrangement the pressure exerted by such abutment against the upper surface of the nut located in the bowl of the lower jaw is substantially a direct pressure against the upper surface of the nut, and substantially without any sliding of such abutment over the surface of the nut as the upper jaw is forced towards the lower jaw during the cracking operation. Thus an improved cracking operation is ensured for nuts of various sizes within the range of sizes for which the device is intended.

It is a further object of the invention to provide a very simple form of construction, one which may be readily made from simple castings and with a minimum amount of machining, and one which can be readily assembled at low cost.

Other objects and uses of the invention will appear

from a detailed description of the same, which consists in the features of construction and combinations of parts hereinafter described and claimed.

In the drawing:

Figure 1 shows a side elevation of one embodiment of the invention, with the jaws in fully closed position; and this figure shows that when in such fully closed condition the jaws and handles or grips remain separated sufficiently to avoid pinching the fingers of the user;

Figure 2 shows a vertical longitudinal section along the device shown in Figure 1; being a section taken on the line **2—2** of Figure 3, looking in the direction of the arrows;

Figure 3 shows a cross-section taken on the lines **3—3** of Figures 1 and 2, looking in the direction of the arrows; and

Figure 4 shows a fragmentary vertical longitudinal section of the bowl portion of a modified arrangement, such modification consisting in the insertion of the screw-threaded stem of the adjustable abutment in a slanting direction, as explained in the preamble.

Referring to the drawing, the nut-cracker includes the two jaw members **10** and **11**. Each of these is provided with a concave recess at one end, indicated at **12** and **13** for the two members, respectively. The jaw members are pivoted or hinged together adjacent to these recesses by the cross-wise extending pin **14** extended through the outside lugs **15** and **16** of the member **11**, and the intermediate lug **17** of the member **10**. The jaw members are provided with hand grip portions **18** and **19**, respectively. These are preferably formed of generally rounded cross-section to provide convenient gripping surfaces, the details of which need not be detailed here.

The two jaw members are provided with companion surface elements **20** and **21** which come together when the jaws are rocked towards each other the maximum intended movement. In Figure 2 the jaws are shown in such fully rocked or closed condition. Preferably the surface element of the jaw member **10** comprises a slight downwardly extending lug adapted to engage with the surface element **21** of the member **11** at the fully closed position. Examination of Figures 1 and 2 also shows that the hand grip portions **18** and **19** are so formed that their proximate surfaces **22** and **23** are separated from each other a substantial distance even when the jaws are fully rocked towards each other. This distance, indicated at **24** is sufficient to accommodate fingers of rather large size without crushing, so that danger of pinching is substantially avoided even when the device may be carelessly used.

The recesses **12** and **13** are of substantially semispherical form as well shown in Figures 2 and 3 in particular. When the two jaws are brought fully together to their limited positions the proximate edges of these bowls come close to each other so as to afford a more or less tightly closed enclosure. The nut, shown at **25** within the device and accommodated between the bowls, is forced against the floor of the lower bowl during the compressing operation, and when that compressing operation has been completed to crack the nut said proximate bowl edges **26** and **27** come into or close to registry and engagement with each other so as to provide an enclosed space within which the final cracking operation occurs. Thus, any particles of shell or nut meat which may be ejected at the time of cracking are retained within the enclosed nut space, and prevented from being scattered outside thereof. Although I have shown these proximate edges as being slightly separated from each other when the jaws are in their fully closed positions, and when the surface elements **20** and **21** have come together, this detail of construction has been shown as a means to ensure that the closing action will be exactly limited at the desired point of movement, since it is possible to finish such surface elements **20** and **21** to ensure such result. Evidently, however, the arrangement might be one in which the entire proximate edge portions of the two bowls would come substantially into contact at the fully jaw closed position, and I contemplate such detailed arrangements as being within the scope of my invention.

It is now evident that in order to produce the needed compressive force on the nut just prior to completion of the jaw closing movement the inner surface of the upper jaw member (or some element related to that surface) must be so located with respect to the sustaining surface of the lower jaw's bowl that proper contact of the upper bowl's surface with the top surface portion of the nut will occur early enough in the jaw closing movement to ensure production of the needed compressive force against the nut prior to arresting of the jaw closing movement. Such assurance is provided by the means which I shall now explain as follows:

I have provided an adjustable abutment **28** carried by the upper jaw member and adapted to co-operate with the surface **13** of the lower jaw member to produce the needed compressive force against the nut. This adjustable abutment conveniently comprises the lower end of a screw-threaded stem **29** threaded through the bowl of the jaw member **10**, or an enlargement carried by such lower end. This stem **29** extends out through the bowl of the jaw member **10** and is provided with a grip portion **30** by which the stem may be conveniently turned to bring the abutment **28** into correct relation with the jaw member so that the proper compressive action will be produced against the nut carried by the lower bowl, and to meet the needs of the size of that nut.

Examination of Figure 2 shows that the stem **29** shown in that figure extends through the bowl of the upper jaw member in such direction that such stem extends in direction substantially normal to the plane of the hinge connection **14** and the point of engagement of the two surface elements **20** and **21** with each other when the jaws are fully closed together. Under these relations it is seen that during the last portion of the closing movement the direction of travel of the abutment **28** is substantially normal to such plane so that a direct compressive action is produced against the nut. This relation is based on the assumption that the amount of such last portion of abutment travel, needed to effect the cracking compression force against the nut, is relatively small. If the nut is of soft shell material so that a larger amount of compressing movement must be produced (from the point of first engagement of the abutment **28** with the top surface of the nut shell until that shell is finally cracked at the time of contact between the surface elements **20** and **21**) it is seen that a substantial change in the direction of movement of the abutment **28** will occur during the actual compressing action against the nut's shell. That is, under such assumed conditions, the direction of movement of the abutment **28** will change during the actual compressing operation due to the angle of rock executed by the upper jaw member (with respect to the lower jaw member) during the actual shell compressing action.

In Figure 4 I have shown a modified arrangement in which the stem **29a** extends at an angle with respect to the plane passing through the hinged connection **14a** and the point of engagement of the surface elements **20a** and **21a**. This angle is such that when the jaws are fully closed together the stem slants down and towards the hinged connection at an angle of the order of a few degrees, generally about five degrees. With this arrangement, and with the threaded stem adjusted for production of the final cracking action at or just prior to the engagement of the surface elements **20** and **21** with each other, the first contact of the abutment with the top surface of the nut shell will generally occur while the stem slants slightly outwardly with respect to said plane; and during the shell deforming action needed to produce cracking, such angle will change to a slight inward slant at the time of final arresting of the jaw hinging movement.

Conveniently the jaw members may be formed of cast aluminum or other light metal; and suitable orna-

mentation of the outer surfaces of the bowl portions may be provided as desired.

I claim:

A nut-cracker comprising in combination upper and lower jaw members, a hinged connection between said members, a hand grip element extending outwardly from each jaw member at a location substantially diametrically opposite to said hinged connection, a concave nut receiving pocket in the lower jaw member adjacent to said hinged connection, means to limit rock of the jaw members towards each other in the nut cracking direction comprising rock limiting surface elements on the jaw members in position to engage together at completion of the rock of the jaw members towards each other about the hinged connection, and an abutment carried by the upper jaw member and facing the concave pocket of the lower jaw member in position to engage the top surface of a nut located in the concave pocket during rock of the jaw members towards each other, said abutment being adjustable with respect to the upper jaw member towards or away from the plane which includes the hinged connection between the jaw members and the rock limiting surface element on the upper jaw member and said abutment being adjustable towards and away from said plane in a direction non-normal to said plane and along a line which slants towards the axis of the hinged connection.

References Cited in the file of this patent

UNITED STATES PATENTS

2,720,900	Quist	Oct. 18, 1955

FOREIGN PATENTS

179,225	Canada	Sept. 11, 1917
439,263	Great Britain	Dec. 3, 1935