Sept. 14, 1954 A. W. SHARP ET AL 2,688,765

POULTRY SHACKLE

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Fig. 1

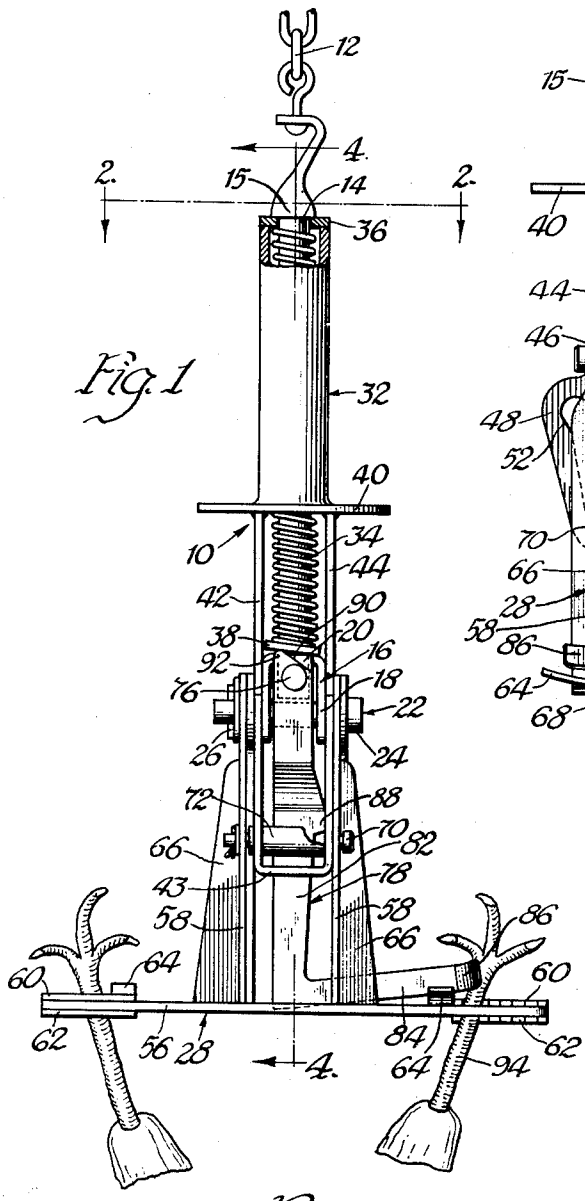


Fig. 3

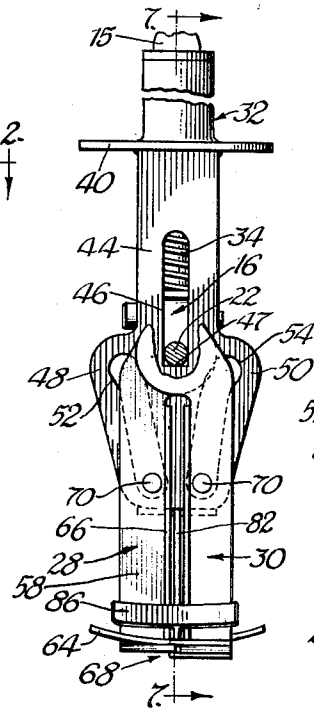


Fig. 4

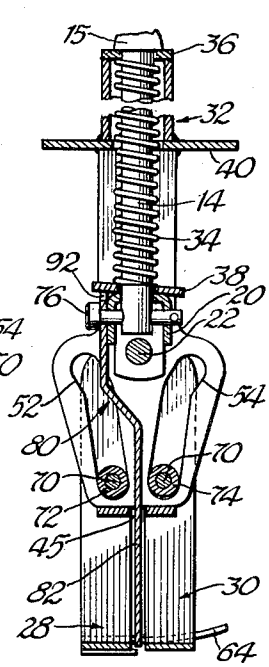


Fig. 5

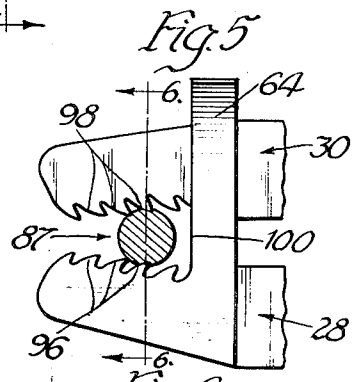


Fig. 6

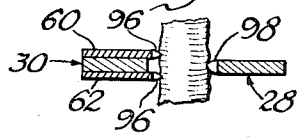
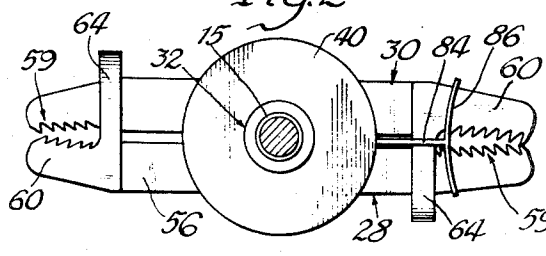


Fig. 2



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POULTRY SHACKLE

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Fig. 7

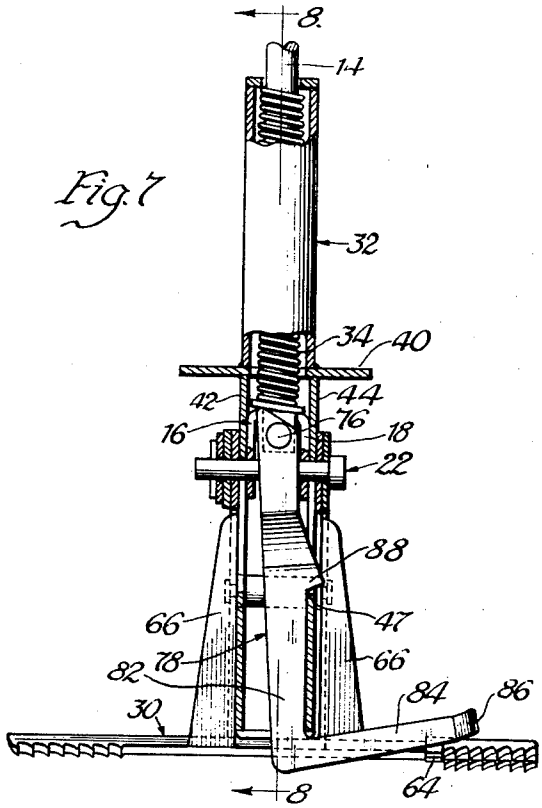


Fig. 8

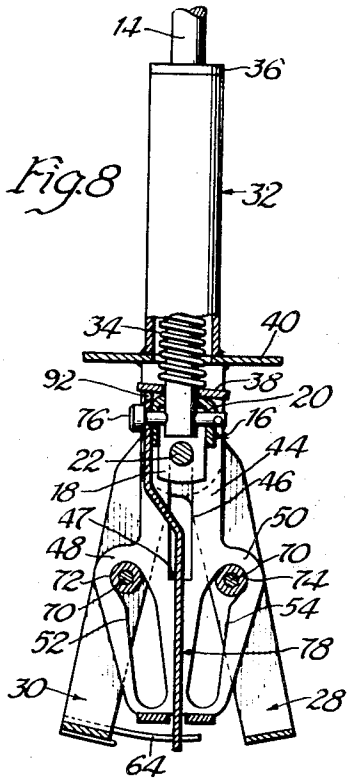


Fig. 9

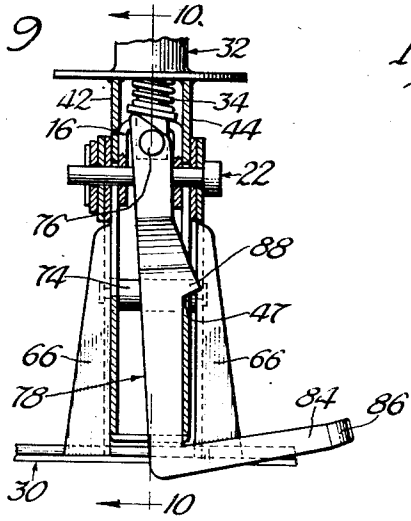
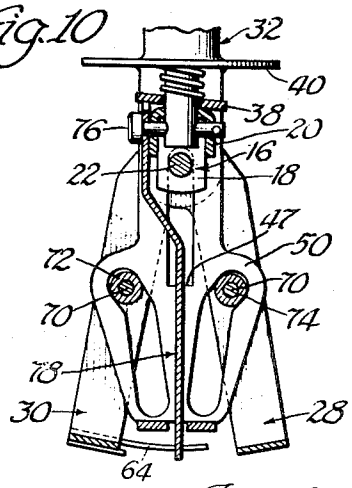


Fig. 10



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UNITED STATES PATENT OFFICE

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POULTRY SHACKLE

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Application February 6, 1951, Serial No. 209,639

19 Claims. (Cl. 17—44.1)

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This invention relates to a shackle, and more particularly to a shackle for holding a fowl during a picking operation.

The shackle of the present invention is included in that general type which suspends the fowl by the legs in head-down position, and is mounted for carrying the fowl through a picking machine.

The dressing of poultry has become in recent years a mass production operation. It is desirable that the fowl being dressed be quickly and easily suspended or released from the conveyor chain which carries the fowl through the numerous poultry dressing operations.

Some of the early shackles were made of wire frame, of which some elements were sprung toward each other in a clasping position. The legs of the fowl were easily inserted between leg holding elements, which were spring loaded. To release the fowl it was necessary to manually grasp the spring members and to force them away from the legs of the fowl to release the legs.

If the spring force was too great, insertion of the legs and release thereof became a problem. If the spring force was too small, some of the stronger birds could struggle free, or if they were heavy enough some birds would slip out of the shackle.

More recently there has been a trend to make shackles with grasping jaw members. Some of these shackles retained the idea of using the legs of the fowl to force the jaw members apart for entrance of the legs into the shackle. Some of the shackles had means for positively ejecting the legs from the shackle. Other shackles had means for cocking the grasping jaws in an open position with trigger means for snapping the jaws shut when the legs of the fowl were introduced into the shackle.

This invention falls in the latter class of shackles. One of the undesirable features in this latter class of shackles, as in all the other shackles, is that only about the same force is necessary to be applied directly to the jaws of the shackle to open them as need be applied to the cocking mechanism. Now it is desirable that the cocking of the jaws be a simple and non-exhausting operation, as a worker may be required to cock many thousands of shackles during a day. But if the force needed to cock the shackle is small, some of the stronger fowl may be able to apply a great enough force upon the shackle jaws to force the jaws open.

In the type of shackles wherein the shackle is cocked open and a trigger is supplied for closing the jaws, it is customary to employ a spring

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biased pawl for cocking the jaws. One spring is used for operating the jaws of the shackle and a second and much weaker spring is used to operate the pawl. The weaker spring is necessary to permit triggering of the mechanism with small forces. The use of two springs, of course, doubles the possibility of failure of parts. Furthermore, the use of a relatively weak spring on the pawl makes jamming of the pawl by foreign matter a problem.

The jaw type poultry shackles heretofore in use include pivotable leaf members having notches therein which cooperate with notches in a base member. The notches in the leaves are of tapering width to accommodate different size legs. In the release of the legs from the shackle, the leaves are pivoted toward the open position, thus gradually releasing the grasped legs. This often results in one leg being released before the other. It is more desirable to have a sharp and sudden opening of the grasping jaws for simultaneous release of the legs of the fowl.

In the leaf type shackles, usually a portion of the leaf is pivoted to a position where it prevents outward movement of the leg from the registered notches. Thus the leg being grasped must be positioned just right so that it is positioned to be grasped as the notches in the leaf and base register, and must not be in the way of the portion of the leaf which pivots to position to close the notches.

Thus, one of the objects of this invention is to provide a shackle which may be cocked in an open position with a trigger operable by an object thrust into the jaws of the shackle to effect closing of the shackle, which shackle may be easily opened by the cocking mechanism but which resists opening by a force applied to the jaws of the shackle.

Another object of this invention is to provide a shackle having clasping jaws and a pawl mechanism for locking said jaws in an open position, said jaws and pawl mechanism being operable by a single spring.

A further object of this invention is to provide a shackle having a pawl mechanism which is triggered by a small force and which is biased to locking position by the spring which operates the jaws of the shackle.

Still another object of this invention is to provide a shackle wherein the clasping jaws may be spread sharply and suddenly to effect simultaneous release of both legs of the fowl and to obviate need of a member for ejecting the grasped articles from the shackle.

Still a further object of this invention is to

provide a shackle having simple clasping jaws which simply and easily receive and position the articles to be grasped and which effectively close and open end of the jaws.

Further objects and advantages of this invention will become apparent as the following description proceeds and the features of novelty which characterize this invention will be pointed out with particularity in the claims annexed to and forming part of this specification.

A preferred embodiment of the invention is shown in the accompanying drawing, in which—

Figure 1 is a front elevation of the shackle with parts broken away showing the legs of a fowl grasped by the jaws of the shackle;

Figure 2 is a view taken on the line 2—2 of Figure 1;

Figure 3 is a side view and looking from the right of the shackle shown in Figure 1, with part of the shackle stem omitted and with the jaws in closed position;

Figure 4 is similar to Figure 3 and is a cross-section view taken on line 4—4 of Figure 1;

Figure 5 is an enlarged plan view of the grasping jaws of the shackle showing the leg of a fowl therein;

Figure 6 is a cross-section view taken on line 6—6 of Figure 5;

Figure 7 is a cross-section view taken on line 7—7 of Figure 3, showing the jaws of the shackle in the full open position with the handle of the shackle moved downward to its lowest position wherein the cams engage the uppermost edge of the cam tracks;

Figure 8 is a cross-section view taken on the line 8—8 of Figure 7;

Figure 9 is similar to Figure 7, showing the shackle in the latched open position after the handle has been released from the position shown in Figure 7 and with the latch means holding the shackle open;

Figure 10 is a cross-section view taken on line 10—10 of Figure 9.

Referring now to the drawings, there is shown in Figure 1 a poultry shackle generally indicated at 10 suspended by a chain 12 from a conveyor (not shown). Connected to the chain 12 and extending therebelow is an elongated support which includes stem member 14 which extends vertically and has fastened at the lower end thereof, and forming part of said support, a downward pointing U-shaped member generally indicated at 16. The member 16 has a pair of oppositely facing and downwardly extending long arms 18 and a pair of oppositely facing and downwardly extending short arms 20. The short arms 20 are displaced substantially 90° from the long arms 18.

Journalled in the long arms 18 of member 16 is a pivot shaft 22 having a head 24 at one end thereof and equipped at the other end with a cotter pin 26 to retain the pin 22 in position. Pivotally mounted on pin 22 are a pair of complementary jaw members generally indicated at 28 and 30.

A tubular handle member generally indicated at 32 is mounted concentrically on stem 14. A spring 34 is positioned concentrically on stem 14 and is positioned between stem 14 and handle 32. A flange 36 is welded to the upper end of handle 32 to engage the upper end of spring 34.

A toggle plate 38 is positioned above member 16 and encircles stem 14. The lower end of spring 34 is positioned against the upper face of toggle plate 38. The spring 34 is under compression and serves to bias the handle 32 upwardly. The upper portion 15 of stem 14 is flared outwardly to engage the flange 36 of handle 32 to prevent the handle from being pushed upwardly off the stem 14.

The lower end of the handle 32 is defined by washer-like member 40 which is welded to the lower end of tubular handle 32. Extending downwardly from the lower face of washer-like member 40 are a pair of spaced parallel arms 42 and 44 joined together at their lower ends for rigidity by transverse member 43. These arms 42 and 44 are best shown in the side views, Figures 3, 4, 8 and 10. The arms 42 and 44 have therein slots 46 to provide for relative motion downward of the handle and arms with respect to the pins 22. The arms 42 and 44 extend laterally outward to form ears 48 and 50 adjacent their lower portions. The handle 32 with arms 42 and 44 attached thereto is a unitary member that may be referred to as a spreader member, which is descriptive of its operation as will be seen from the description of operation hereinbelow.

The ears 48 and 50 on arms 42 and 44 provide for cam tracks 52 and 54 which are cut therein. These cam tracks are slots which, from their lowest point, extend upwardly at a small angle tapering outwardly from the vertical. Toward their upper ends, the cam tracks suddenly taper outwardly from the vertical more sharply, for a reason that will be seen hereinafter.

Referring back to the jaw members 28 and 30, the jaw member 28 includes a horizontally disposed elongated bar 56 and a pair of upstanding flange members 58. The flange members 58 are pivotally mounted on the pin 22. The right-hand end of bar 56 is serrated at its inner face, as shown at 59, in Figure 2. The left-hand end of bar 56 has welded to the upper and lower edges thereof a pair of serrated bars 60 and 62. The upper serrated bar 62 has a tongue 64 which extends transverse to the longitudinal direction of the bar 56. A fillet member 66 is welded between each flange 58 and the elongated bar 56 to provide rigidity to the jaw member.

The jaw member 30 is formed similarly to jaw member 28 but the serrated ends of the elongated bar portion of the jaw member are in reversed position from that described with respect to jaw member 28. In this way the opposite serrated portions of oppositely facing jaw members lie in different planes, as shown at 68 in Figure 3, and as more clearly shown in Figure 6. The oppositely facing jaw members 28 and 30 are identical members, but since they are not laterally symmetrical and because they face each other they are referred to as complementary members.

The flanges 58 of the jaw member 28 have a pin 70 extending therethrough. This pin is located approximately half-way between the elongated bar 56 and the pivot pin 22. Mounted on this pin 70 is a roller 72. This roller 72 is positioned within cam tracks 52 in the arms 42 and 44. The jaw member 30 has a similar roller 74 which is positioned in cam tracks 54 of arms 42 and 44. These rollers 72 and 74 serve as cam followers.

A pin 76 is journalled in short legs 20 of U-shaped member 16 and at 77 in the lower end of stem 14, as shown in Figure 4. The pin 76 extends transversely to pin 22 journalled in legs 18 of member 16, and is positioned above shaft 22. Pivotally mounted on pin 76 is a trigger member generally indicated at 78. This trigger member

78 is laterally offset adjacent the upper end thereof, as indicated at 80 in Figure 4, to provide clearance for the pin 22. The upright leg 82 of trigger member 78 extends through a slot 45 in transverse member 43 and is positioned substantially between the oppositely facing jaw members 28 and 30.

This lower portion of trigger member 78 is L-shaped in form, as seen in Figure 1. The transverse leg 84 of trigger member 78 has a bar 86 attached thereto. This bar 86 overlies the pocket or socket 87 formed by the spaced apart jaw members 28 and 30. A tooth or pawl 88 is formed in the upstanding leg 82 of trigger member 78, for a purpose that will be described hereinafter.

The uppermost edge 90 of trigger member 78 located above the pivot pin 76 slopes upwardly to the left, as shown in Figures 1, 7 and 9. This sloping edge 90 forms a peak 92 at the upper left-hand corner of the trigger member 78. This peak 92 extends above the uppermost extent of the U-shaped member 16 and engages the bottom face of the toggle plate 38. The spring 34 bearing upon the upper face of toggle plate 38 exerts a force on the peak 92 of trigger member 78 to give a counterclockwise moment to the trigger member 78 around the pivot pin 76.

The pawl 88 on the trigger member 78 butts against the arm 44 when the shackle is in closed position, but when the shackle is in the open position, the slot 48 in arm 44 registers with the pawl 88 and permits rotation of the trigger member counterclockwise about pin 76. This permits the pawl 88 to engage the lowermost edge 47 of slot 46 and to prevent the return of the handle 32 to the forward position under the bias of spring 34. Thus, the pawl 88 effectively locks the shackle in an open position.

When an article such as the leg 94 of the fowl is inserted in the open pocket formed by the spread apart jaw members 28 and 30, it will strike the bar 86 at the end of trigger member 78. Only a slight force is necessary to cause the trigger 78 to be pivoted about pin 76 and the tooth, or pawl, 88 is disengaged from the surface 47 of slot 46, thus permitting spring 34 to return the handle to the uppermost position and snapping shut the jaws of the shackle on the leg of the fowl.

Although the spring 34 is a very strong spring, it will be seen that the lever arm from the point of contact, of the leg 94, with the bar 86 to the pivot pin 76 is very much greater than the lever arm from the peak 92 to the pivot pin 76, and thus only a small force is necessary to trigger the shackle.

In the operation of the shackle, the spring 34 has the spreader member, comprising handle 32 and arms 42 and 44, normally biased upwardly. When this occurs, the rollers 72 and 74 are in the lowermost part of the cam tracks 52 and 54 and the jaw members 28 and 30 are closed, as shown in Figures 3 and 4. To cock the shackle to the open position, the handle 32 is grasped by the operator and the spreader member is pulled downwardly. It will be seen that the washer-like member 40 provides a support for the hand of the operator and also prevents the operator from moving his hand into any of the apparatus that is moving, where he may be injured. As the handle 32 and the arms 42 and 44 are moved downwardly, the jaw members 28 and 30 of the shackle are spread until the lower edge 47 of slot 46 registers with the pawl 88 in trigger member 78. When the pawl 88 enters the slot 46 and engages the lower surface 47 thereof, the shackle will be locked in the open position.

To explain the spreading operation of the jaw members 28 and 30, it will be seen that as the handle 32 and ears 42 and 44 move downwardly, the cam tracks 52 and 54 are moved downwardly relative to the cam followers 72 and 74. During the greater portion of the downward movement of the cam tracks, the cams 72 and 74 move outward slightly because of the very small included angle between the cam tracks and the vertical. Toward the end of the downward movement of the cam tracks, there is a sudden divergence of the cam tracks and the jaws are suddenly and sharply opened. This is very desirable for the purpose of completely releasing simultaneously all objects that are grasped by the jaws of the shackle. This sudden spreading of the jaws takes place just before the registering of the pawl 88 with the slot 46 in ear 44.

To insure the engagement of pawl 88 with the lowermost edge 47 of slot 46, movement of the cams in the cam tracks to a point beyond the latching position is provided. This is clearly shown in Figures 7 to 10, where in Figures 7 and 8 the cams 72 and 74 are in engagement with the uppermost limit of cam tracks 52 and 54. At this point pawl 88 has moved into slot 46 but does not engage the lowermost edge 47 of slot 46.

In Figures 9 and 10, the handle 32 has been released and the spring 34 has biased the handle upwardly. In this position, the latched open position, the pawl 88 is engaging edge 47 of slot 46. It will be seen in Figure 10 that the cams 72 and 74 are slightly below the uppermost limit of the cam tracks 52 and 54.

In the insertion of the legs of the fowl into the shackle, the operator grasps the fowl by the legs and simultaneously enters the legs between the oppositely facing bars 56 of the jaw members 28 and 30. The legs are prevented from moving inwardly too far between the bars 56 by means of the tongues 64 which protrude across the space and form a bottom wall for the pocket or socket which is formed by the spread apart bars.

The legs are entered simultaneously in opposite ends of the spaced apart jaws of the shackle, and as the one leg 94 engages element 86 of the trigger member 78, the pawl member is released as described above, and the jaws of the shackle snap shut on the legs. The shackle does not close to the fully closed position, since the legs of the fowl are inserted therebetween. The release of the fowl is accomplished simultaneously with the cocking of the shackle for receiving the next fowl. The operator simply pulls down the handle 32 until the pawl 88 again locks the shackle in an open position. The sudden divergence of the cam tracks 52 and 54 during the cocking of the shackle causes an immediate and complete release of the legs of the fowl that are grasped by the shackle jaws.

There are a number of novel features in the jaw formation of the shackle. The jaw members 28 and 30 bound a socket or pocket 87, as shown in Figure 5. The serrations 96 and 98 on opposite sides of the pocket 87 are positioned at different levels. These serrations 96 and 98 point inwardly toward the base of the pocket 87 and also are tapered so that the pocket 87 is widest adjacent the innermost end 100 of the pocket 87. The innermost end 100 is bounded by tongue 64.

The inwardly pointing serrations 96 and 98 and the outwardly tapering pocket 87 prevent

the bird from kicking its legs outward and out of the shackle. The tapered pocket 87 between the jaws of the shackle make it necessary that the jaws be opened a little in order that the bird may kick itself free from the shackle. However, as explained above, direct force on the clamping jaws will fail to open the clamping jaws. This is true because of the presence of the cams and cam slots. While in previous devices the legs of the fowl were held by means of direct spring pressure, here, although the spring is operable to resist motion of the cams relative to the cam tracks, the small angle of divergence of the cam tracks cooperates with the cams to resist spreading of the jaws of the shackle and more positive gripping of the legs of the fowl is obtained.

While there has been shown and described a particular embodiment of this invention, it will be obvious to those skilled in the art that various changes and modifications may be made therein without departing from the invention and, therefore, it is intended in the appended claims to cover all such changes and modifications as fall within the true spirit and scope of the invention.

What we claim as new and desire to secure by Letters Patent of the United States is:

1. A shackle comprising a support, a pair of jaw members pivotally mounted on said support and normally biased toward each other to clasping position, means operatively associated with said jaw members for spreading said jaw members to an open position, a latch carried by said support for locking said jaw members in said open position, and a single spring operatively associated with said jaw members and said latch for biasing said jaw members to clasping position and for biasing said latch toward the locking position.

2. A shackle comprising a support, a pair of jaw members pivotally mounted on said support and normally biased toward each other to clasping position, means operatively associated with said jaw members for spreading said jaw members to an open position, latch means carried by said support for locking said jaw members in said open position, a single spring operatively associated with said jaw members and said latch means for biasing said jaw members to clasping position and for biasing said latch means toward the locking position, and a trigger attached to said latch means and extending over a portion of the open jaw members, whereby an object entering said open jaws will trip the latch, causing the jaws to be biased toward each other to the clasping position.

3. A shackle comprising a support, a pair of jaw members pivotally mounted on said support and normally biased toward each other to clasping position, means operatively associated with said jaw members for spreading said jaw members to an open position, latch means carried by said support for locking said jaw members in said open position, a single spring operatively associated with said jaw members and said latch means for biasing said jaw members to clasping position and for biasing said latch means toward the locking position, a trigger attached to said latch means and extending over a portion of the open jaw members, whereby an object entering said open jaws will trip the latch, causing the jaws to be biased toward each other to the clasping position, said latch means comprising a pivoted member carried by said support, and a toggle plate biased by said spring against said pivoted member at a point where a moment force is applied to said pivoted member about its pivot.

4. A shackle comprising a support, a pair of jaw members pivotally mounted on said support and normally biased toward each other to clasping position, a handle carried by said support, ears fixed to said handle, said handle and ears being movable with respect to the pivot mounting of said jaw members, spring means engaging said handle and biasing said handle in one direction with respect to the pivot mounting of said jaw members, and cam means on said jaw members and said ears cooperating to spread said jaw members as the handle is moved in another direction with respect to the pivot mounting of said jaw members, said cam means cooperating to resist spreading of the jaw members upon application of a spreading force directly to said jaw members.

5. A shackle comprising an elongated support, a pair of jaw members pivotally mounted on said support and normally biased toward each other to clasping position, a handle carried by said support, ears fixed to said handle, said handle and ears being reciprocable longitudinally of the support and with respect to the pivot mounting of said jaw members, spring means engaging said handle and biasing said handle in one direction with respect to the pivot mounting of said jaw members, cam means on a pair of cooperating members consisting of said jaw members and said ears cooperating to spread said jaw members as the handle is moved in another direction with respect to the pivot mounting of said jaw members, said cam means cooperating to resist spreading of the jaw members upon application of a spreading force directly to said jaw members, said cam means comprising elongated cam tracks in one of said pair of cooperating members diverging slightly from the longitudinal axis of said support over a greater portion of their length and then diverging sharply over the remainder of their length, and cam followers, carried by the other of said pair of cooperating members, in said cam tracks positioned so as to first traverse the slightly diverging portion of the cam tracks as the jaws are spread, whereby substantial longitudinal motion of the cam tracks relative to the cam followers is required to effect spreading of the jaws, and whereby a relatively small spring force will resist a relatively great spreading force applied directly to the jaws.

6. A shackle comprising an elongated support, a pair of jaw members pivotally mounted on said support and normally biased toward each other to clasping position, a handle carried by said support, ears fixed to said handle, said handle and ears being reciprocable longitudinally of the support and with respect to the pivot mounting of said jaw members, spring means operatively associated with said handle for biasing said handle in one direction with respect to the pivot mounting of said jaw members, cam means on said jaw members and said ears cooperating to spread said jaw members as the handle is moved in the opposite direction with respect to the pivot mounting of said jaw members, said cam means cooperating to resist spreading of the jaw members upon application of a spreading force directly to said jaw members, said cam means comprising elongated cam tracks in said ears diverging slightly from the longitudinal axis of said support over a greater portion of their length

and then diverging sharply over the remainder of their length, and cam followers on said jaw members operatively associated with said cam tracks and positioned so as to first traverse the slightly diverging portion of the cam tracks as the jaws are spread, whereby substantial longitudinal motion of the cam tracks relative to the cam followers is required to effect spreading of the jaws, and whereby a relatively small spring force will resist a relatively great spreading force applied directly to the jaws.

7. A shackle comprising an elongated support, a pair of jaw members pivotally mounted on said support and normally biased toward each other to clasping position, a handle carried by said support, ears fixed to said handle, said handle and ears being reciprocable longitudinally of the support and with respect to the pivot mounting of said jaw members, spring means biasing said handle and ears in one direction with respect to the pivot mounting of said jaw members, cam means on said jaw members and said ears cooperating to spread said jaw members as the handle is moved in the opposite direction with respect to the pivot mounting of said jaw members, said cam means cooperating to resist the spreading of the jaw members upon application of a spreading force directly to said jaw members, latch means operatively associated with said jaws for locking said jaws in an open position, and a single spring operatively associated with said jaw members and said latch means for biasing said jaws to clasping position and for biasing said latch means toward the locking position.

8. A shackle comprising a support, a pair of jaw members pivotally mounted on said support, a single spring operatively associated with said jaw members for biasing said jaw members to clasping position, means for spreading the jaw members suddenly, whereby complete release of the clasped articles is effectuated, said means for spreading the jaw members suddenly comprising a member carried by said support and reciprocable with respect to the pivot mounting of said jaw members, said member having therein cam tracks which diverge sharply, and cam followers on said jaw members positioned in said cam tracks and movable relative to said cam tracks along the length thereof.

9. A shackle having a pair of jaw members, each jaw member comprising an elongated bar oppositely facing a complementary member of the other jaw member, said elongated bars being serrated adjacent the ends of their opposed faces, one end of each bar having serrations in the plane of the bar, the other end having serrations thereon in planes displaced from the plane of the bar, and said bars being disposed so that the one end of one bar faces the other end on the oppositely facing bar, whereby the serrations of adjacent oppositely facing ends are positioned at different levels with respect to each other, and said jaw members being mounted for pivoting about an axis substantially parallel to said elongated bars.

10. A shackle having a pair of jaw members, each jaw member comprising an elongated bar oppositely facing a complementary member of the other jaw member, said elongated bars being serrated adjacent the ends of their opposed faces, one end of each bar having serrations in the plane of the bar, the other end having serrations thereon in planes spaced parallel to the plane of the bar, said bars being disposed so that the one end of one bar faces the other end on the

oppositely facing bar, whereby the serrations of adjacent oppositely facing ends are positioned at different levels with respect to each other, and tongues spaced inwardly from the ends of the bars extending substantially across the space between the bars when they are spread apart, and said jaw members, when spread apart, cooperating to define therebetween a pair of spaced sockets.

11. A shackle having a pair of jaw members, each jaw member comprising an elongated bar oppositely facing a complementary member of the other jaw member, said jaw members being mounted for pivoting about an axis substantially parallel to said elongated bars, said elongated bars being serrated adjacent the ends of their opposed faces, one end of each bar having serrations in the plane of the bar, the other end having serrations thereon in planes spaced from the plane of the bar, said bars being disposed so that the one end of one bar faces the other end on the oppositely facing bar, whereby the serrations of adjacent oppositely facing ends are positioned at different levels with respect to each other, and tongues spaced inwardly from the ends of the bars extending substantially across the space between the bars when they are spread apart, said tongues being displaced from the plane of the bar and extending transverse to the length thereof, and being located adjacent the innermost extent of the adjacent serrations at the ends of the bars, and said jaw members, when spread apart, cooperating to define therebetween a pair of spaced sockets.

12. A shackle having a pair of jaw members, each jaw member comprising an elongated bar oppositely facing a complementary member of the other jaw member, said jaw members being mounted for pivoting about an axis substantially parallel to said elongated bars, said elongated bars being serrated adjacent the ends of their opposed faces, one end of each bar having serrations in the plane of the bar, the other end having serrations thereon in planes above and below the plane of the bar, said bars being disposed so that the one end of one bar faces the other end on the oppositely facing bar, whereby the serrations of the oppositely facing ends are positioned at different levels with respect to each other, and tongues spaced inwardly from the ends of the bars extending substantially across the space between the bars when they are spread apart, a pair of said opposite serrated ends and the adjacent tongue substantially bounding a pocket open at its outer end, said serrated ends tapering away from each other from the tip ends thereof, whereby said pocket is of increasing width from the ends of the bars to said tongue.

13. A shackle having a pair of jaw members, each jaw member comprising an elongated bar oppositely facing a complementary member of the other jaw member, said jaw members being mounted for pivoting about an axis substantially parallel to said elongated bars, said elongated bars being serrated adjacent the ends of their opposed faces, one end of each bar having serrations in the plane of the bar, the other end having serrations thereon in planes above and below the plane of the bar, said bars being disposed so that the one end of one bar faces the other end on the oppositely facing bar, whereby the serrations of the oppositely facing ends are positioned at different levels with respect to each other, and tongues spaced inwardly from the ends of the bars extending substantially across the space between

the bars when they are spread apart, a pair of said opposite serrated ends and the adjacent tongue substantially bounding a pocket open at its outer end, said serrated ends tapering away from each other from the tip ends thereof, whereby said pocket is of increasing width from the ends of the bars to said tongue, the serrations on said bars pointing generally towards the inner ends of the pockets.

14. A shackle comprising a pair of jaw members, said jaw members having portions thereof adapted to be spread apart to bound an open ended pocket, said pocket tapering along its length to its smallest width at the open end thereof, a spreader member operatively associated with said jaw members affording means for opening said jaw members, and cam means operatively associated with said jaw members to prevent spreading of said pocket bounding portions of the jaw members by forces applied directly to said pocket bounding portions, said cam means comprising elongated cam tracks in said spreader member, and cam followers carried by said jaw members positioned in said cam tracks.

15. A shackle comprising a pair of jaw members, said jaw members having portions adapted to be spread apart to bound an open ended pocket, said pocket tapering along its length to its smallest width at the open end thereof, said pocket bounding portions having serrations pointing generally toward the portion of the pocket of greatest width, a spreader member operatively associated with said jaw members affording means for opening said jaw members, and cam means operatively associated with said jaw members to prevent spreading of said pocket bounding portions of the jaw members by forces applied directly to said pocket bounding portions, said cam means comprising elongated cam tracks in said spreader member, and cam followers carried by said jaw members positioned in said cam tracks.

16. A shackle comprising an elongated support, a pair of jaw members having jaws formed at one end thereof and each mounted on said support to pivot about a pivot axis lying transverse to the longitudinal axis of the support, a reciprocating spreader member carried by said support and movable in opposite directions parallel to the longitudinal axis of said support, cam means operatively associated with said spreader member and said jaw members to effectuate opening and closing of said jaws, and a spring carried by said support and biasing said spreader member in a direction to effectuate closing of said jaws.

17. A shackle comprising an elongated support, a pair of jaw members having jaws formed at one end thereof and each mounted on said support to pivot about a pivot axis lying transverse to the longitudinal axis of the support, a reciprocating spreader member carried by said support and movable in opposite directions parallel to the longitudinal axis of said support, cam means operatively associated with said spreader member and said jaw members to effectuate opening and closing of said jaws, and a spring carried by said support and biasing said spreader member in a direction to effectuate closing of said jaws, said cam means comprising cam tracks and cam followers in operative engagement with each other at points spaced radially from said pivot axis.

18. A shackle comprising an elongated support, a pair of jaw members having jaws formed at one end thereof and each mounted on said support to pivot about a pivot axis lying transverse to the longitudinal axis of the support, a reciprocating spreader member carried by said support and movable in opposite directions parallel to the longitudinal axis of said support, cam means operatively associated with said spreader member and said jaw members to effectuate opening and closing of said jaws, a spring carried by said support and biasing said spreader member in a direction to effectuate closing of said jaws, a latch operatively associated with said jaw members for locking said jaw members in said open position, and said spring also being operatively associated with said latch for biasing said latch toward the locking position.

19. A shackle comprising an elongated support, a pair of jaw members having jaws formed at one end thereof and each mounted on said support to pivot about a pivot axis lying transverse to the longitudinal axis of the support, a reciprocating spreader member carried by said support and movable in opposite directions parallel to the longitudinal axis of said support, cam means operatively associated with said spreader member and said jaw members to effectuate opening and closing of said jaws, a spring carried by said support and biasing said spreader member in a direction to effectuate closing of said jaws, a latch, operatively associated with said jaw members for locking said jaw members in said open position, said spring also being operatively associated with said latch for biasing said latch toward the locking position, and a trigger secured to said latch overlying the space between the open jaw members and affording means for tripping the latch to release the jaw members from the open position.

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