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G. T. HART ET AL
CORD SEVERING INSTRUMENT
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1,993,546

Fig. 1.

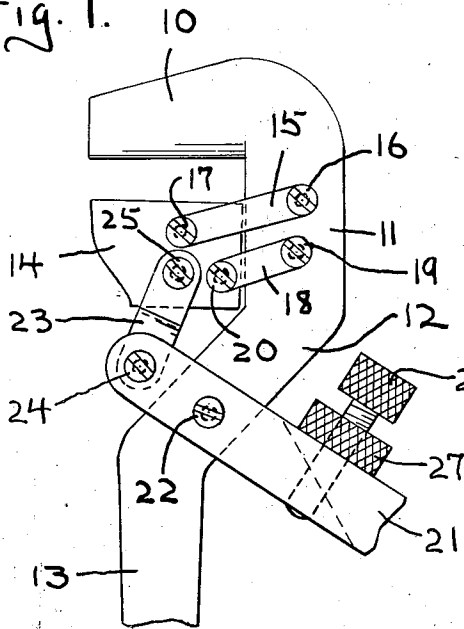


Fig. 2.

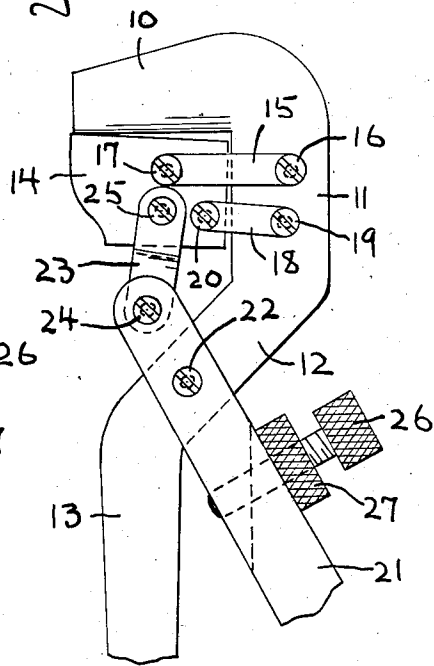


Fig. 3.

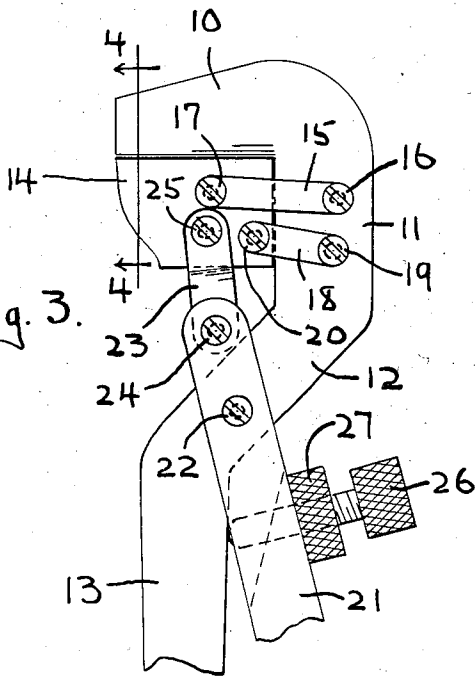
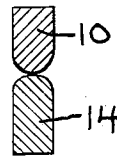


Fig. 4.



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UNITED STATES PATENT OFFICE

1,993,546

CORD SEVERING INSTRUMENT

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Application July 28, 1932, Serial No. 625,302

16 Claims. (Cl. 128—306)

This invention relates to instruments of the type adapted for use for applying heavy pressure at opposite sides of a cord or other part of an animal for severing the cord, and particularly for use for severing the spermatoc cord of an animal by pressure applied through the walls of the pouch without the necessity for any external cutting. It is one of the objects of the invention to provide a new and improved form and arrangement of parts by which the cord when placed in position between the pressure jaws may be held in the desired operative position.

To this end, it is one of the objects of the invention to provide an improved arrangement by which one of the pressure jaws is given a slight angular movement in one direction with respect to the other jaw in the course of the movement of the two jaws toward each other whereby the free ends of the jaws are first brought into preliminary gripping relation, and the movable jaw is then given an angular movement in the opposite direction into the final operative position. It is one of the objects of the invention to provide an arrangement of this type in which the frictional engagement of certain of the mounting links with the parts upon which they are pivotally mounted is of assistance in the matter of bringing the movable jaw to its angular preliminary gripping position, and in which such frictional engagement serves normally to prevent turning of the movable jaw out of such preliminary angular position except as the jaw is turned by the application of pressure positively thereto after all lost motion has been taken up.

It is one of the objects of the invention to provide an arrangement comprising adjustable stop means by which the closing movement of the jaws may be limited so as to make a single device suitable for use with different sized animals, thus making it unnecessary to include more than one instrument in the equipment of a stock farm.

It is another object of the invention to improve devices of this type in sundry details hereinafter pointed out. The preferred means by which the several objects are accomplished are illustrated in the drawing and are hereinafter specifically described. That which is believed to be new and is sought to be covered by Letters Patent is set forth in the claims.

In the drawing,—

Fig. 1 is a face view of the improved device forming the subject matter of this application, with the handle portions broken away.

Fig. 2 is a view similar to Fig. 1, but showing

the parts in changed position, with the movable jaw in its preliminary angular position.

Fig. 3 is a view similar to Figs. 1 and 2 but with the movable jaw in its final operative position; and

Fig. 4 is a vertical cross-section taken at line 4—4 of Fig. 3.

Referring now to the several figures of the drawing, in which corresponding parts are indicated by the same reference characters, 10 indicates a jaw member having an arm 11 connected with the rear end of the jaw and extending downwardly therefrom, such arm 11 being connected by an obliquely disposed portion 12 with a handle 13, all of such parts in the construction shown being formed integrally with each other. A second transversely disposed jaw member 14 is movably connected with the jaw member 10 by means of a pair of links 15 at opposite faces of the device, said links 15 being pivotally connected with the arm 11 by means of a bolt 16 and pivotally connected with the jaw member 14 by means of a bolt 17, the arrangement being such that the jaw member 14 is movable up and down toward and from the jaw member 10 along the arm 11. A second set of links 18 are also provided at opposite faces of the device, pivotally connected with the arm 11 by means of a bolt 19 and pivotally connected with the jaw member 14 by means of a bolt 20, the bolt 19 being substantially directly below the bolt 16, while the bolt 20 is located considerably closer to the end of the jaw member 14 than is the bolt 17.

For moving the jaw member 14 toward and from the jaw member 10, a handle member 21 is provided, pivotally connected with the obliquely disposed portion 12 of the handle 13 by means of a bolt 22, the upper end of the handle 21 being in the form of a yoke so as to receive the handle 13 and part 12 therein. At its upper end the handle 21 is provided with a link 23 pivotally connected thereto by means of a bolt 24, the upper end of the link 23 being in the form of a yoke connected by means of a bolt 25 with the jaw member 14. In the arrangement shown, the bolt 25 is located substantially directly below the bolt 17 and directly opposite the bolt 20.

Stop means is provided for limiting the movement of the handles 21 and 13 toward each other, comprising a set screw 26 secured by means of screw threads in the handle member 21 transversely thereof so as to engage the handle member 13 as is best shown in Fig. 3, serving thus to limit the movement of the handle members toward each other. The set screw is provided with

a lock-nut 27 for securing the screw in the desired adjusted position.

In the arrangement shown, the bolts 16, 17, 22, 24 and 25 are all arranged so as to be tightened securely in position without applying pressure against the parts pivotally connected by means of such bolts. The bolts 19 and 20 are arranged, however, so as to tighten the links 18 firmly by friction against the opposite faces of the jaw member 14 and the arm 11 when such bolts are tightened in position.

With the bolts 19 and 20 tightened in position so as to apply a frictional grip upon the jaw 14 and the arm 11, and with the screw 26 adjusted to permit movement of the handles 13 and 21 to the limit of their motion, when the movable jaw 14 is moved downwardly into the position shown in Fig. 1, the jaw member 14 preferably stands in slightly angular position with respect to the jaw member 10. The arrangement is such that when pressure is applied upwardly to the movable jaw 14 through the link 23, the links 18 have a tendency to drag by reason of their frictional engagement with the arm 11, serving to provide a downward pull on the jaw member 14 at the end portion adjacent to the arm 11. At the same time, the frictional engagement between the links 18 and the movable jaw 14 has a tendency to swing the movable jaw into angular position with respect to the jaw 10 as the links move upwardly. At the same time there is no appreciable tendency for causing the movable jaw 14 to swing in the opposite direction out of such preliminary angular position with respect to the jaw 10. The result is that when the movable jaw 14 reaches approximately the end of its upward movement into the position as shown in Fig. 2 the movable jaw 14 has effective pressure relationship with the jaw 10 initially at the free end portions only of said jaws. The arrangement is such that upon continued upward movement of the movable jaw member by means of the link 23 the movable jaw member is caused to swing in counter clock-wise direction in Fig. 2 into substantially parallel relation to the jaw 10 as shown in Fig. 3, the pressure applied positively through the link 23 serving to overcome the pressure applied by friction through the links 18.

The frictional effect of the tightened engagement of the links 18 with the arm 11 and the jaw member 14 is normally sufficient for taking up all lost motion in the connections between the jaw 14 and the jaw 10 for holding the parts in the position as shown in Fig. 2 with jaws converging forwardly as the movable jaw approaches the jaw 10. Under such conditions the links 15 are under compression while the links 18 are under tension. When the power is applied to the movable jaw 14 for moving it from its preliminary position as shown in Fig. 2 into its final operative position as shown in Fig. 3, such power is applied substantially vertically, or at right angles with respect to the tension longitudinally of the links 18 and the compression longitudinally of the links 15. Under such conditions, the frictional resistance with respect to such final movement of the member 14 is very great so as to require a comparatively heavy pressure upwardly through the link 23 for swinging the movable jaw into its final position as shown in Fig. 3. In the arrangement shown, when the jaw member 14 moves into its final operative position the longitudinal pressure conditions in connection with the links 15 and 18 are reversed so that

the links 18 are under compression and the links 15 are under tension.

With the arrangement of the device as illustrated and as above described, an operator can readily apply the device in position and hold the cord in position until the free end portions of the jaws have reached an effective pressure relationship by which the cord is kept from slipping out of position between the jaws. The operator is then free to employ both hands to advantage for applying the required pressure upon the handles 13 and 21.

As will be readily understood, by an adjustment of the set-screw 26 the movement of the jaw 14 toward the jaw 10 can be limited and controlled so as to limit the effective action of the device to correspond to the size of the parts operated upon. By the provision of this arrangement, a single device can be used to advantage for all of the various uses to which a device of this type is normally put, it being thus unnecessary to provide more than a single device as complete equipment for a stock farm.

In the above description and in the claims, the arm 11 is described as being extended downwardly from the end of the jaw 10, and the other parts are described correspondingly. It is to be understood that this phraseology is used only for the sake of convenience without regard to the position in which the device may be used in practice.

While the form of device as shown in the drawing is preferred, it is to be understood that the invention is not limited thereto except so far as the claims may be so limited by the prior art, it being understood that changes might be made in the detailed form of device without departing from the invention.

We claim:—

1. In a device of the type described, the combination of a jaw member, a second jaw member, means for moving said second jaw member toward and from said first named jaw member, and means adapted to exert effective pressure on said second jaw member for causing the face of said jaw normally to stand in substantially fixed angular position converging toward its free end with respect to the face of the other jaw as said second jaw member is moved toward said first named jaw member and adapted when said jaws are brought into effective pressure relationship at their free end portions to yield for permitting said second jaw member to swing under pressure through a substantial angle into substantially parallel relation to said first named jaw member.

2. In a device of the type described, the combination of a jaw member, a second jaw member, means for moving said second jaw member toward and from said first named jaw member, link means swingingly mounted with respect to said jaw members so as to permit said second jaw member to move toward and from said first named jaw member, and other link means swingingly mounted with respect to said jaw members on axes in spaced relation to the axes on which said first named link means is mounted adapted normally to exert effective pressure on said second jaw member for causing its face to stand in convergent position toward its free end with respect to the face of the other jaw when said second jaw member is moved toward said first named jaw member and adapted when said jaws are brought into effective pressure relationship at their free end portions to permit said second jaw member to swing under

pressure into substantially parallel relationship to said first named jaw member.

3. In a device of the type described, the combination of a jaw member, a second jaw member, means for moving said second jaw member toward and from said first named jaw member, link means swingingly mounted with respect to said jaw members so as to permit said second jaw member to move toward and from said first named jaw member, and other link means swingingly mounted with respect to said jaw members adapted normally to exert effective pressure on said second jaw member for causing its face to stand in convergent position toward its free end with respect to the face of the other jaw when said second jaw member is moved toward said first named jaw member and adapted when said jaws are brought into effective pressure relationship at their free end portions to permit said second jaw member to swing under pressure into substantially parallel relationship to said first named jaw member.

4. In a device of the type described, the combination of a transversely disposed jaw member, an arm extending downwardly from one end portion of said jaw member, a second jaw member movable upwardly and downwardly along said arm toward and from said first named jaw member, transversely disposed link means pivotally connected with said second jaw member and with said arm, means bearing on said second jaw member at a point substantially directly below the pivotal connection of said link means to said second jaw member for forcing said jaw member toward said first named jaw member, and other link means pivotally connected with said second jaw member and said arm below said first named link means adapted normally to exert effective pressure on said second jaw member for causing its face to stand in convergent position toward its free end with respect to the face of the other jaw when said second jaw member is moved toward said first named jaw member and adapted when said jaws are brought into effective pressure relationship at their free end portions to permit said second jaw member to swing under pressure into substantially parallel relationship to said first named jaw member.

5. In a device of the type described, the combination of a transversely disposed jaw member, an arm extending downwardly from one end portion of said jaw member, a second jaw member movable upwardly and downwardly along said arm toward and from said first named jaw member, transversely disposed link means pivotally connected with said second jaw member and with said arm, means bearing on said second jaw member at a point substantially directly below the pivotal connection of said link means to said second jaw member for forcing said jaw member toward said first named jaw member, and other link means below said first named link means pivotally connected at one end with said arm and pivotally connected at the opposite end with said second jaw member at a point on said second jaw member located between said arm and the point where said first named link means is connected with said second jaw member and adapted normally to exert effective pressure on said second jaw member for causing its face to stand in convergent position toward its free end with respect to the face of the other jaw when said second jaw member is moved toward said first named jaw member and adapted when said jaws are brought into effective pressure relationship at their free

end portions to permit said second jaw member to swing under pressure into substantially parallel relationship to said first named jaw member.

6. In a device of the type described, the combination of a jaw member, a second jaw member, means for moving said second jaw member toward and from said first named jaw member, link means swingingly mounted with respect to said jaw members so as to permit said second jaw member to move toward and from said first named jaw member, and other link means swingingly mounted with respect to said jaw members on axes in spaced relation to the axes on which said first named link means is mounted, the arrangement being such that normally upon movement of said second jaw member toward said first named jaw member one of said link means is under tension and the other link means is under compression for holding said jaws in convergent position toward their free ends until the free end portions of the jaws are brought into pressure relationship to each other and that upon continued movement the longitudinal pressure conditions in connection with said links are reversed and said second jaw member is permitted under pressure to swing into substantially parallel relationship to said first named jaw member.

7. In a device of the type described, the combination of a jaw member, a second jaw member, means for moving said second jaw member toward and from said first named jaw member, link means swingingly mounted with respect to said jaw members so as to permit said second jaw member to move toward and from said first named jaw member, and other link means swingingly mounted with respect to said jaw members on axes in spaced relation to the axes on which said first named link means is mounted, the arrangement being such that one of said swingingly mounted link means is adapted by frictional engagement with the connected parts to exert effective pressure on said second jaw member for causing its face to stand in convergent position toward its free end with respect to the face of the other jaw when said second jaw member is moved toward said first named jaw member and adapted when said jaws are brought into effective pressure relationship at their free end portions to permit said second jaw member to swing under pressure into substantially parallel relationship to said first named jaw member.

8. In a device of the type described, the combination of a jaw member, a second jaw member, means for moving said second jaw member toward and from said first named jaw member, link means swingingly mounted with respect to said jaw members so as to permit said second jaw member to move toward and from said first named jaw member, and other link means swingingly mounted with respect to said jaw members on axes in spaced relation to the axes on which said first named link means is mounted, the arrangement being such that one of said swingingly mounted link means is adapted normally by frictional engagement with one of said jaw members to apply an effective pressure on said movable jaw member in opposition to the movement of said movable jaw member toward said first named jaw member serving to cause the face of said second jaw member to stand in convergent position toward its free end with respect to the face of the other jaw when said second jaw member is moved toward said first named jaw member and adapted when said jaws are brought into effective pressure relationship at their free end portions to permit said

second jaw member to swing under pressure into substantially parallel relationship to said first named jaw member.

9. In a device of the type described, the combination of a jaw member, a second jaw member, means for moving said second jaw member toward and from said first named jaw member, link means swingingly mounted with respect to said jaw members so as to permit said second jaw member to move toward and from said first named jaw member, and other link means swingingly mounted with respect to said jaw members on axes in spaced relation to the axes on which said first named link means is mounted, the arrangement being such that one of said pivotally mounted link means is adapted normally by frictional engagement with the movable jaw member to oppose swinging movement of said jaw member with respect to the link means serving as said second jaw member is moved toward said first named jaw member to cause the face of said second jaw member to stand in convergent position toward its free end with respect to the face of the other jaw and adapted when said jaws are brought into effective pressure relationship at their free end portions to permit said second jaw member to swing under pressure into substantially parallel relationship to said first named jaw member.

10. In a device of the type described, the combination of a transversely disposed jaw member, an arm extending downwardly from one end portion of said jaw member, a second jaw member movable upwardly and downwardly along said arm toward and from said first named jaw member, transversely disposed link means pivotally connected with said second jaw member and with said arm, means bearing on said second jaw member at a point substantially directly below the pivotal connection of said link means to said second jaw member for forcing said jaw member toward said first named jaw member, and other link means pivotally connected with said second jaw member and said arm below said first named link means and adapted normally by frictional engagement with the connected parts to exert effective pressure on said second jaw member for causing its face to stand in convergent position toward its free end with respect to the face of the other jaw when said second jaw member is moved toward said first named jaw member and adapted when said jaws are brought into effective pressure relationship at their free end portions to permit said second jaw member to swing under pressure into substantially parallel relationship to said first named jaw member.

11. In a device of the type described, the combination of a transversely disposed jaw member, an arm extending downwardly from one end portion of said jaw member, a second jaw member movable upwardly and downwardly along said arm toward and from said first named jaw member, transversely disposed link means pivotally connected with said second jaw member and with said arm, means bearing on said second jaw member at a point substantially directly below the pivotal connection of said link means to said second jaw member for forcing said jaw member toward said first named jaw member, and other link means below said first named link means pivotally connected at one end with said arm and pivotally connected at the opposite end with said second jaw member at a point on said second jaw member located between said arm and the point where said first named link means is connected

with said second jaw member and adapted normally by frictional engagement with the connected parts to exert effective pressure on said second jaw member for causing its face to stand in convergent position toward its free end with respect to the face of the other jaw when said second jaw member is moved toward said first named jaw member and adapted when said jaws are brought into effective pressure relationship at their free end portions to permit said second jaw member to swing under pressure into substantially parallel relationship to said first named jaw member.

12. In a device of the type described, the combination of a jaw member, a second jaw member, means for moving said second jaw member toward and from said first named jaw member, link means swingingly mounted with respect to said jaw members so as to permit said second jaw member to move toward and from said first named jaw member, and other link means swingingly mounted with respect to said jaw members on axes in spaced relation to the axes on which said first named link means is mounted, said other link means being adapted by frictional engagement with its connected parts normally to cause one of said link means to be under tension and the other link means to be under compression when said second jaw member is moved toward said first named jaw member for holding said jaws in convergent position toward their free ends until the free end portions of the jaws are brought into pressure relationship to each other and adapted upon further continued movement of the second jaw member toward said first named jaw member to cause the longitudinal pressure conditions in connection with said links to be reversed and to permit said second jaw member to swing under pressure into substantially parallel relation to said first named jaw member.

13. In a device of the type described, the combination of a jaw member, a second jaw member, means for moving said second jaw member toward and from said first named jaw member, and means providing an articulated connection between said jaw members at their rear ends adapted normally to hold said second jaw member by yielding pressure thereon in approximately fixed angular position with respect to said first named jaw member throughout its limited movement toward said first named jaw member prior to effective pressure relationship of said jaw members but arranged with a limited amount of play in the connections for permitting the second jaw member to swing into parallelism with said first named jaw member at the end of its operative stroke.

14. In a device of the type described, the combination of two handle members pivotally connected together, a jaw member carried by one of said handle members transversely thereof, a second jaw member, link means pivotally connected at one end with the other of said handle members and pivotally connected at its other end with said second jaw member for moving said second jaw member toward and from said first named jaw member when either handle member is swung toward and from the other handle member, and connections between said second jaw member and said one handle member having a limited amount of play therein permitting a slight angular movement of said second jaw member as it approaches said first named jaw member and comprising means having a frictional engagement with said second jaw member adapted nor-

5 mally to hold said second jaw member turned to the limit of its angular motion in the direction for causing said jaw members to converge toward the free end of said first named jaw member as said jaw members are moved toward each other.

10 15. In a device of the type described, the combination of a jaw member, a second jaw member, means for moving said second jaw member toward and from said first named jaw member, and means adapted normally by a frictional engagement with one of said jaw members to hold said second jaw member preliminarily in convergent position toward its free end with respect to the first named jaw member when moved toward said first named jaw member and adapted upon continued movement by yielding with respect to said frictional holding effect to permit said second jaw member to swing under pressure into substantially parallel relation to said first named jaw member.

16. In a device of the type described, the combination of a jaw member, an arm connected therewith and extending at an angle thereto, a second jaw member, means for moving said second jaw member toward and from said first named jaw member, and means comprising a link pivotally connected at one end with said second jaw member and at its opposite end with said arm adapted normally by a yielding pressure on said second jaw member at the start of its closing movement from its fully opened position to cause said second jaw member to converge toward its free end with said first named jaw member and adapted as movement of said second jaw member toward said first named jaw member continues to resist swinging movement of the second jaw member out of said converging position with respect to said first named jaw member.

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