Dec. 7, 1965 G. J. GOETZ 3,221,576

WIRE STRIPPER

Filed Aug. 17, 1964 2 Sheets-Sheet 1

FIG. 1

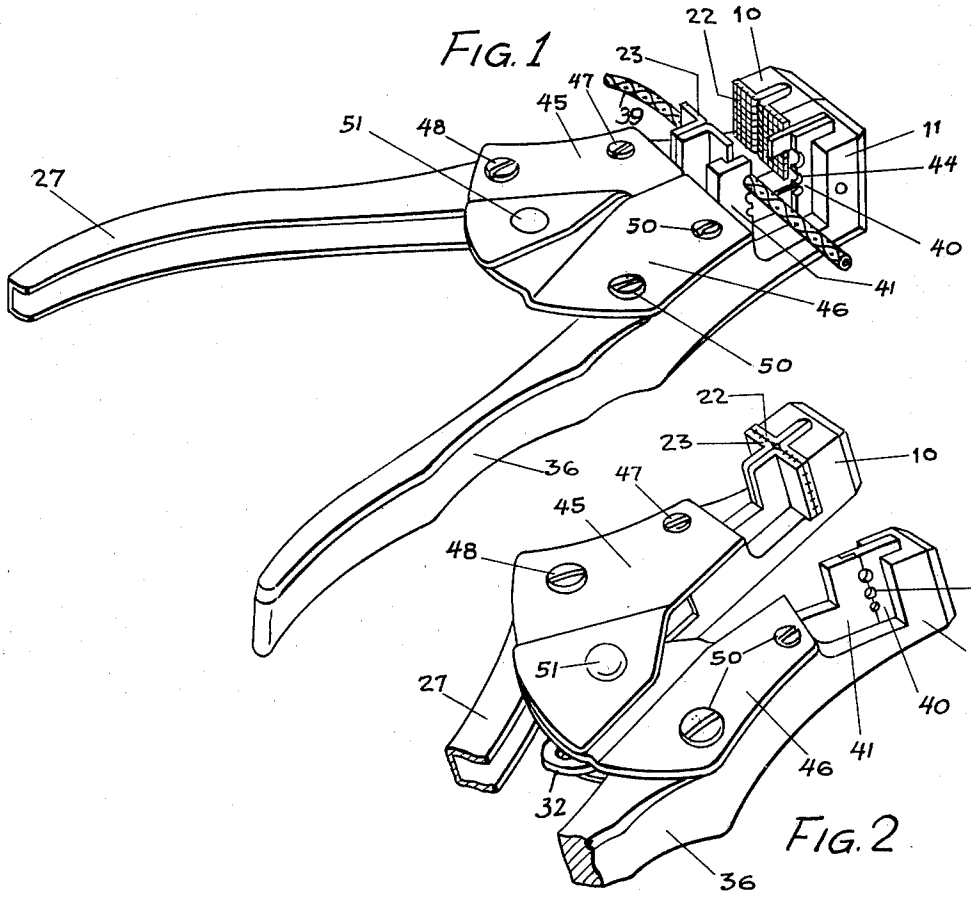


FIG. 2

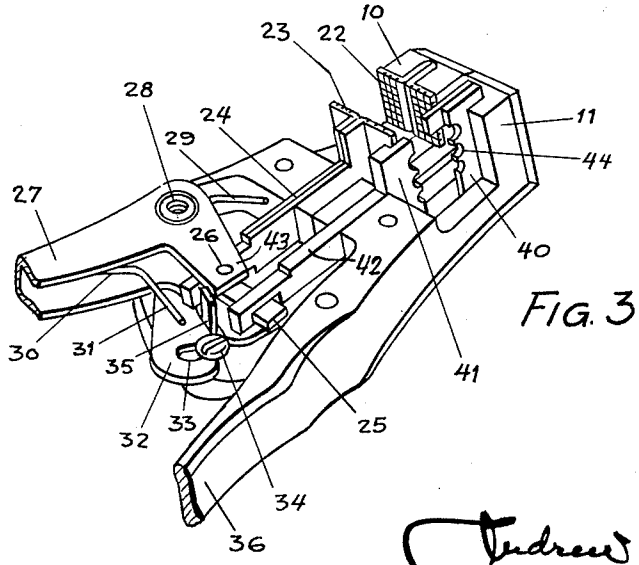


FIG. 3

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WIRE STRIPPER

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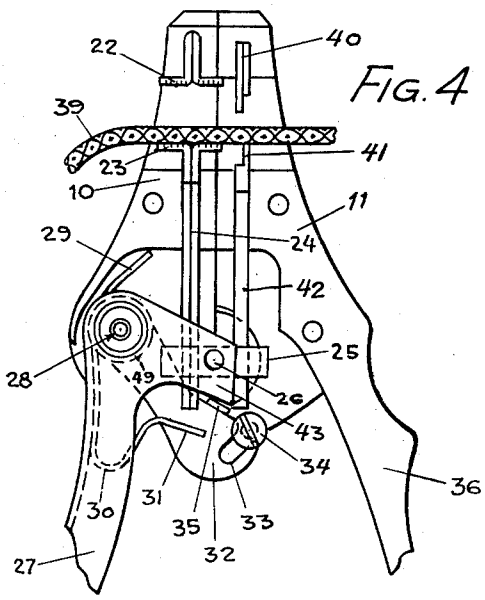


FIG. 4

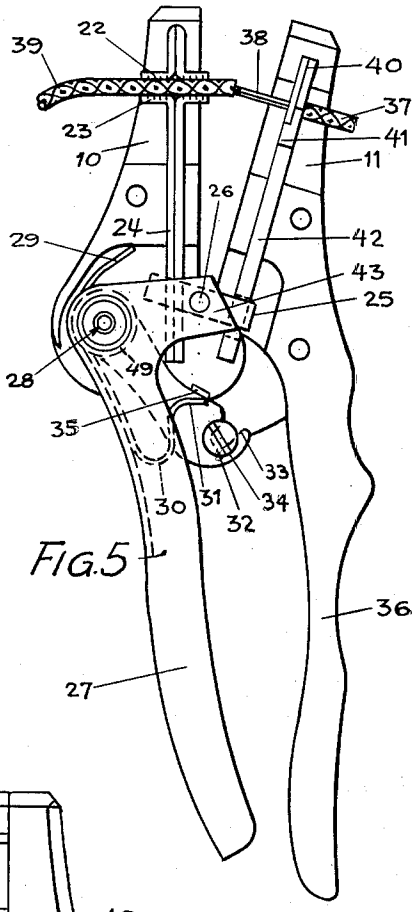


FIG. 5

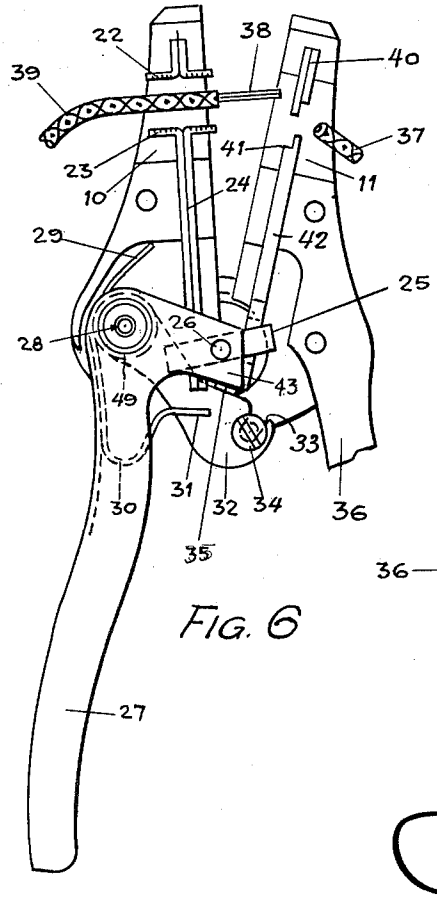


FIG. 6

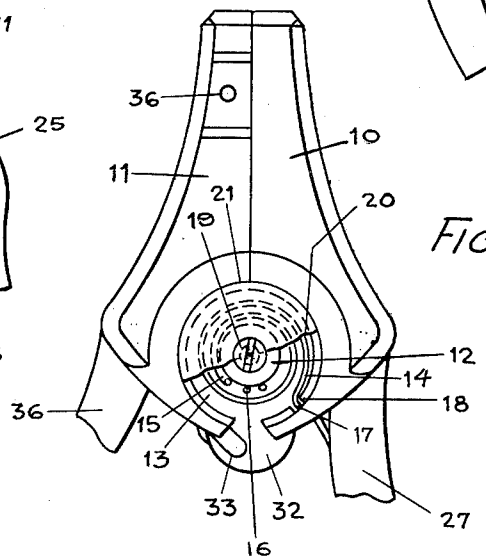


FIG. 7

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WIRE STRIPPER

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18 Claims. (Cl. 81—9.5)

This invention relates to wire strippers, and is particularly concerned with improvements in the general type of wire stripper disclosed in Wood Patent 2,313,793.

In wire strippers of that kind the one hinged half of the body carries a pair of jaws for clamping the wire by its insulation a given distance from the end, and the other hinged half of the body carries a pair of blades adapted to be closed on the insulation to cut it completely around the wire and immediately thereafter strip it off when the hinged halves of the body are swung apart. Due to the fact that at the end of this operation the wire is still held between the clamping jaws and the stripper blades it is quite apt to be crushed if the hinged parts are allowed to close again under action of their return spring when the handles are released, unless the tool is properly constructed. It is important, therefore, that the clamping jaws and/or stripper blades be permitted to open up fully before the hinged halves of the body are allowed to close again. On the other hand, if the catch for holding the hinged halves of the body spread apart had to be released manually at the end of each wire stripping operation, the operation would be far too slow for production jobs requiring numerous wire stripping operations. It is, therefore, the principal object of my invention to provide a new organization and arrangement of the elements of a wire stripper of the kind mentioned in order to obtain:

(1) Opening of the clamping jaws and stripper blades immediately after each stripping operation and before the halves of the tool body can possibly return to closed position;

(2) Improved performance of the wire stripper without too much complication of the construction and with as little increase, if any, in cost of production of the tool;

(3) Simplification and improvement of the construction by operating all moving parts in the pivotal movement of one handle;

(4) Better timing and equalized operation of the moving parts by using a rocker element pivoted to the pivotal one of the handles and arranged so that one end operates one of the two clamping jaws in proper timed relation to the closing and opening of the stripper blades, the movable one of which is operated by the other end of the rocker element;

(5) Further simplification of the construction by having a single grasshopper type spring that serves to hold the aforesaid pivotal handle normally in retracted position, this spring having also an inwardly extending end portion arranged to engage a lug on a catch that is pivoted on the one body half to swing into locking position in the closing of the clamping jaws and stripper blades and subsequent spreading apart of the two body halves to lock the latter in V-relationship and hold them in that relationship until the aforesaid pivotal handle is returned to nearly fully retracted position by the grasshopper spring, when the hinged halves of the body, which have a separate coiled torsion spring normally tending to hold them in closed position, return to that position.

My improved wire stripper with the above new features is much more practical and durable than previous wire strippers of this general type, because the hinged halves cannot swing open for the stripping operation until after full closing of the clamping jaws and cutting blades, and then the catch is applied only at the end of the opening up of the hinged halves, during which the insulation is

stripped. Inasmuch as the catch locks the halves open while the clamping jaws open and the stripper blades open, I positively eliminate any danger of crumpling the wire. And, finally, the catch cannot be released until the clamping jaws and stripper blades are fully opened. In other words, my improved construction insures the correct sequence of operation, each step depending for its start upon the completion of the previous step.

The invention is illustrated in the accompanying drawings, in which:

FIGS. 1 to 3 are perspective views of my improved wire stripper, FIGS. 1 and 3 being alike except that in FIG. 3 the cover plates are removed to expose the parts that would otherwise be hidden, the clamping jaws and cutter blades being in fully retracted position in both views, while FIG. 2 shows the clamping jaws and cutter blades closed and the hinged body members opened as at the end of a wire srtipping operation;

FIGS. 4 to 6 are face views with the cover plates removed as in FIG. 3 to better show the relationship of the parts in all of the different stages of one complete wire stripping operation, and

FIG. 7 is a rear view of FIG. 4 showing the torsion spring that interconnects the two hinged body members and tends normally to hold them closed.

The same reference numerals are applied to corresponding parts in these seven views.

Referring to the drawings, the wire stripper comprises a pair of body members or carriers **10** and **11** hingedly connected as shown at **12** in FIG. 7 on the back of the tool where a circular depression **13** is provided in concentric relation to the pivot bearing **12** to accommodate a torsion spring **14**, one end **15** of which is adjustably connected to the body half **11** by entry of a right angle bent end portion in either one of a series of circumferentially spaced holes **16**, while the other end **17** is engaged in a notch **18** in the body half **10**, thereby urging the body halves **10** and **11** normally to the closed position. A screw **19** secures a circular cover plate **20** at its center to body half **10**, the two body halves together providing a shallow large radius circular depression **21** concentric with depression **13** in which the plate **20** is accommodate substantially flush with the back of the tool.

Body member **10** carries the wire clamping jaws, consisting of a stationary jaw **22** fixed on the body member **10** and a movable jaw **23**, the latter having a slidable shank portion **24** guided in member **10** and slidably pivotally connected in the lower portion of member **10** with one end of a rocker bar **25** disposed transversely with respect to the jaw **23** and pivoted intermediate its ends, as at **26**, to the handle **27**. This handle is pivotally mounted, as at **28**, on the body member **10** and is normally urged to its fully retracted position shown in FIGS. 1, 3 and 4 by means of a grasshopper type spring **29–30** that is coiled around the pivot **28** and has one end **29** bearing against the body member **10** and the other end **30** bearing against the handle **27**. The latter end **30** has an inward right angle extension **31** that is so arranged in relation to the elongated catch **32** that is pivoted at one end, as at **28**, on the body member **10** and has an arcuate slot **33** in its other end for locking engagement with the reduced shank of a projection **34** on the body member **11**, as shown in FIGS. 5 and 6, whereby the extension **31** will engage a lug **35** provided on the catch **32** intermediate its ends, as shown in FIG. 5, and press the catch resiliently into locking position when the handle **27** is moved to fully closed position with respect to the other handle **36**. The latter is in the form of a rigid extension of body member **11**. This pressure of extension **31** on lug **35** occurs at the point where the body members **10** and **11** have been swung apart to fully opened or V-relationship to

one another at the end of the wire stripping operation illustrated in FIG. 5, where 37 represents the stripped off end portion of freshly cut insulation, 38 the freshly bared wire, and 39 the rest of the wire which is clamped in the wire stripping operation.

Body member 11 carries the wire stripping blades, consisting of a stationary blade 40 fixed on body member 11 and a movable blade 41, the latter having a shank portion 42 slidable in member 11 and slidably pivotally connected by its lower end portion with the other end of the rocker bar 25 so that the movable jaw 23 and movable blade 41 are operated in unison in the pivotal movement of the handle 27 relative to the body member 10. The bar 25 is tiltable at 26 relative to handle 27 to equalize the thrust on the parts 23 and 41 and permit giving further movement to the blade 41 when the jaw 23 can move upwardly no farther by reason of clamping engagement with the wire 39. In that way, compensation is made for different diameters of insulations, and equalized pressure is applied to the parts 23 and 41 when pressure is applied to handle 27. Furthermore, this tieing together of the parts 23 and 41 insures good timing in the opening and closing movements, the jaws 22–23 being closed in correct relationship to the cutting operation of blades 40 and 41, and release of the clamping pressure being insured in correct relation to the opening of the blades 40–41, so that there will be no danger of the wire being crumpled by reason of the body members 10 and 11 closing while the wire is still clamped. As seen in FIG. 6, clamping pressure on the wire 39 is released at the same time that the blades 40 and 41 are moved apart following the stripping operation illustrated in FIG. 5. When the clamping jaw 23 and blade 41 are both fully retracted, the lateral extension 43 on the pivoted end of the handle 27 carrying the pivot 26 bears against the lug 35, as seen in FIG. 6, and, under the action of the coiled spring 29–30, which tends to return the handle 27 to the fully retracted position shown in FIGS. 4 and 7, the catch 32 is swung downwardly to the released position shown in FIGS. 4 and 7, allowing the body members 10 and 11 to return to closed position under the action of spring 14.

In closing, attention is called to FIGS. 1 and 2 where I have shown the cover plates 45 and 46 which conceal the moving parts that I have shown exposed in FIGS. 3 to 6. Plate 45 is fastened by screws 47 and 48 to the body member 10, the screw 48 threading in a center hole in the pivot stud 28 on which handle 27 is pivoted with catch 32 and on which the coiled middle portion 49 of spring 29–30 is mounted. Plate 46 is secured by screws 50 to body member 11. The pivotal connection 51 between the two plates is in coaxial relation to the pivot 12 hingedly connecting the body members 10 and 11 as first described.

In operation, referring to FIGS. 4 to 6:

(1) FIG. 4 shows the tool in the starting position with clamping jaws 22–23 open and stripper blades 40–41 open to receive the wire 39. The operator shifts the wire laterally with respect to jaws 22–23 and blades 40–41, to suit the size of wire, the blades 40–41 having a series of different sizes of notches 44 to accommodate the different sizes of wires;

(2) Then, as seen in FIG. 5, the handles 27 and 36 are closed by hand pressure of the one hand holding the tool, and, in the first portion of the closing movement, the clamping jaws 22–23 clamp the wire 39 while the stripper blades 40–41 cut through the insulation all around the wire, the body members 10 and 11 meanwhile remaining closed as in FIG. 4, and, finally, when no further movement of blade 41 and jaw 23 is possible, the further closing movement of handle 27 toward handle 36 results in the opening or spreading apart of the body members 10 and 11, with the result that the insulation is stripped off the wire 38 as seen at 37 in FIG. 5, the catch 32 being finally applied to the projection 34 under pressure of the inwardly bent end portion 31 of the spring 29–30 to lock

the body members 10 and 11 in the open V-relationship shown, to prevent any likelihood of these members closing prematurely and crumpling the wire, that having been an objection all too common in previous tools of this type, and

(3) Finally, as seen in FIG. 6, the operator relaxes his grip on the handles 27–26, and, as the handle 27 returns under action of spring 29–30, jaw 23 is retracted along with blade 41 leaving the wire 39 free. The retraction of jaw 23 and blade 41 is prior to release of latch 32, thus positively eliminating the likelihood of the wire being crumpled by the premature closing of the body members 10 and 11, the catch 32 being released only when the lateral extension 43 of handle 27 strikes the lug 35 as the handle 27 is being returned to its normal fully retracted position by means of spring 29–30, thereby unlocking the body members 10 and 11 and allowing them to return to the closed position shown in FIG. 4, under action of spring 14, leaving all of the parts in a position to start the next cycle for another wire stripping operation.

From the foregoing description it should be clear that my improved wire stripper operates smoothly and positively, the correct sequence of operations being definitely insured by reason of the fact that each step depends for its commencement upon the completion of the previous step in the cycle of operations. There is no "hair-trigger" adjustment necessary to obtain such functioning, as was the case with some prior designs.

It is believed the foregoing description conveys a good understanding of the objects and advantages of my invention. The appended claims have been drawn to cover all legitimate modifications and adaptations.

I claim:

1. A tool for stripping insulated wire comprising, in combination, a pair of elongated parallel body members pivoted together adjacent one end, spring means urging the body members toward closed parallel relationship but permitting them to be moved to a V-relationship against the action of said spring means, wire clamping means on one body member including a stationary jaw and a movable jaw slidable endwise of said body member toward and away from the stationary jaw, wire stripping means on the other body member including a stationary blade and a blade movable endwise of said body member toward and away from the stationary blade, a pair of handles, one of which is pivotally mounted on and extends from one of said body members and the other of which extends from the other body member, said handles being so arranged as to be adapted to be grasped in one hand of an operator and to be opened and closed with respect to one another, spring means tending normally to urge the pivoted handle to retracted position with respect to the other handle, and an elongated rocker bar disposed in transverse relation to the movable clamping jaw and movable stripping blade and operatively connected at its opposite ends with said jaw and blade and pivotally connected intermediate said ends with said pivoted handle for reciprocation relative to said body members.

2. A tool for stripping insulated wire comprising, in combination, a pair of elongated parallel body members pivoted together adjacent one end, spring means urging the body members toward closed parallel relationship but permitting them to be moved to a V-relationship against the action of said spring means, wire clamping means on one body member including a stationary jaw and a movable jaw slidable endwise of said body member toward and away from the stationary jaw, wire stripping means on the other body member including a stationary blade and a blade movable endwise of said body member toward and away from the stationary blade, a pair of handles, one of which is pivotally mounted on and extends from one of said body members and the other of which extends from the other body member, said handles being so arranged as to be adapted to be grasped in one hand of an operator and to be opened and closed with respect to one

another, spring means tending normally to urge the pivoted handle to retracted position with respect to the other handle, an elongated rocker bar disposed in transverse relation to the movable clamping jaw and movable stripping blade and operatively connected at its opposite ends with said jaw and blade and pivotally connected intermediate said ends with said pivoted handle for reciprocation relative to said body members, and means for releasably locking said body members in opened V-relationship to one another, whereby to enable clamping the wire between said jaws and cutting the insulation from the wire disposed between said blades and thereafter stripping the insulation from the wire in the spreading apart of the body members by closing of the handles, the locking of the body members in open V-relationship preventing crumpling of the wire by premature closing of the body members after the wire stripping operation.

3. A tool for stripping insulated wire as set forth in claim 2 including resilient means for urging the catch to locking position at the conclusion of the closing movement of the handles, and means for positively releasing said catch in a predetermined timed relation to the return of the handles to fully opened relationship.

4. A wire stripper as set forth in claim 2 including a projection on the handle arranged to engage a portion of the catch to move it to locking position in the closing movement of the handles after the body members have been spread to open V-relationship, and another projection on said pivoted handle arranged to engage a portion of said catch to release it in timed relation to the return of the handles to fully retracted position with respect to one another.

5. A wire stripper as set forth in claim 2 wherein the spring means normally returning the pivoted handle to retracted position comprises a grasshopper spring have a coiled middle portion mounted at the pivot for said handle and having one end portion engaging the body member on which the pivot is carried and another end portion engaging the pivoted handle to exert spring pressure on said handle tending to return it to retracted position, the last mentioned end portion having an inwardly bent extension arranged to engage a portion of said catch to urge it resiliently towards locked position when the handles reach fully closed relationship and the body members are swung apart to open V-relationship.

6. A wire stripper as set forth in claim 2 wherein the spring means normally returning the pivoted handle to retracted position comprises a grasshopper spring having a coiled middle portion mounted at the pivot for said handle and having one end portion engaging the body member on which the pivot is carried and another end portion engaging the pivoted handle to exert spring pressure on said handle tending to return it to retracted position, the last mentioned end portion having an inwardly bent extension arranged to engage a portion of said catch to urge it resiliently towards locked position when the handles reach fully closed relationship and the body members are swung apart to open V-relationship, and means including a portion of said pivoted handle arranged to engage the catch to move it to released position when the pivoted handle is returned to fully retracted position whereby to allow the body members to return to closed position in proper timed relation to the return of the handles to fully opened relationship.

7. A tool for stripping insulated wire comprising, in combination, a pair of elongated parallel body members pivoted together adjacent one end, spring means urging the body members toward closed parallel relationship but permitting them to be moved to a V-relationship against the action of said spring means, wire clamping means on one body member including a stationary jaw and a movable jaw slidable endwise of said body member toward and away from the stationary jaw, wire stripping means on the other body member including a stationary blade and a blade movable endwise of said body member toward and away from the stationary blade, a pair of handles, one of which is pivotally mounted on and extends from one of said body members and the other of which extends from the other body member, said handles being so arranged as to be adapted to be grasped in one hand of an operator and to be opened and closed with respect to one another, spring means tending normally to urge the pivoted handle to retracted position with respect to the other handle, and means operable solely by said pivoted handle in the pivotal movement thereof and operatively connected with said movable jaw and movable blade to reciprocate the same relative to said body members.

8. A tool for stripping insulated wire comprising, in combination, a pair of elongated parallel body members pivoted together adjacent one end, spring means urging the body members toward closed parallel relationship but permitting them to be moved to a V-relationship against the action of said spring means, wire clamping means on one body member including a stationary jaw and a movable jaw slidable endwise of said body member toward and away from the stationary jaw, wire stripping means on the other body member including a stationary blade and a blade movable endwise of said body member toward and away from the stationary blade, a pair of handles, one of which is pivotally mounted on and extends from one of said body members and the other of which extends from the other body member, said handles being so arranged as to be adapted to be grasped in one hand of an operator and to be opened and closed with respect to one another, spring means tending normally to urge the pivoted handle to retracted position with respect to the other handle, and means operable solely by said pivoted handle in the pivotal movement thereof and operatively connected with said movable jaw and movable blade to reciprocate the same relative to said body members, said means equalizing the thrust transmitted from said handle to said jaw and blade.

9. A tool for stripping insulated wire comprising, in combination, a pair of elongated parallel body members pivoted together adjacent one end, spring means urging the body members toward closed parallel relationship but permitting them to be moved to a V-relationship against the action of said spring means, wire clamping means on one body member including a stationary jaw and a movable jaw slidable endwise of said body member toward and away from the stationary jaw, wire stripping means on the other body member including a stationary blade and a blade movable endwise of said body member toward and away from the stationary blade, a pair of handles, one of which is pivotally mounted on and extends from one of said body members and the other of which extends from the other body member, said handles being so arranged as to be adapted to be grasped in one hand of an operator and to be opened and closed with respect to one another, spring means tending normally to urge the pivoted handle to retracted position with respect to the other handle, and means operable solely by said pivoted handle in the pivotal movement thereof and operatively connected with said movable jaw and movable blade to reciprocate the same relative to said body members, said means equalizing the thrust transmitted from said handle to said jaw and blade and insuring movement of said jaw and blade in unison in both forward and return movements.

10. A tool for stripping insulated wire comprising, in combination, a pair of elongated parallel body members pivoted together adjacent one end, spring means urging the body members toward closed parallel relationship but permitting them to be moved to a V-relationship against the action of said spring means, wire clamping means on one body member including a stationary jaw and a movable jaw slidable endwise of said body member toward and away from the stationary jaw, wire stripping means on the other body member including a stationary blade

and a blade movable endwise of said body member toward and away from the stationary blade, a pair of handles, one of which is pivotally mounted on and extends from one of said body members and the other of which extends from the other body member, said handles being so arranged as to be adapted to be grasped in one hand of an operator and to be opened and closed with respect to one another, spring means tending normally to urge the pivoted handle to retracted position with respect to the other handle, means operable solely by said pivoted handle in the pivotal movement thereof and operatively connected with said movable jaw and movable blade to reciprocate the same relative to said body members, a catch for locking said body members in open V-relationship, and means on the pivoted handle for moving said catch toward locking position in timed relation to the closing of the handles and releasing said catch in timed relation to the opening of the handles.

11. A wire stripper as set forth in claim **10** in which the last mentioned means operates resiliently in the catch engaging direction and positively in the catch releasing direction.

12. A wire stripper as set forth in claim **10** in which the last mentioned means comprises a spring on the pivoted handle applying resilient pressure on the catch in the catch engaging direction and a projection on the pivoted handle engaging the catch to release it positively.

13. A tool for stripping insulation from wire comprising in combination, a pair of elongated body members disposed side by side and pivotally connected together at one end to swing apart to V-relationship in a wire stripping operation, wire clamping jaws on one body member including a fixed jaw on the outer end thereof and a movable jaw slidable lengthwise of said body member toward and away from the fixed jaw, wire stripper blades on the other body member including a fixed blade on the outer end thereof and a movable blade slidable lengthwise of said body member toward and away from the fixed blade, a pair of hand levers, one of which is rigid with and extends from the pivoted end of one body member and the other of which is pivoted relative to the pivoted end of the other body member and extends therefrom, means connecting the pivoted hand lever with said movable jaw and movable blade operating when the hand levers are pressed together to first close the jaws and blades and then swing the body members apart, spring means normally tending to return the body members when swung apart, and other spring means tending to swing the pivoted hand lever to retracted position relative to the other hand lever.

14. A wire stripper as set forth in claim **13** wherein the means connecting the pivoted hand lever with said movable jaw and movable blade is constructed and arranged to equalize the thrust transmitted from said handle to said jaw and blade.

15. A wire stripper as set forth in claim **13** wherein the means connecting the pivoted hand lever with said movable jaw and movable blade is constructed and arranged to equalize the thrust transmitted from said handle to said jaw and blade and insure their movement in unison in both directions.

16. A tool for stripping insulation from wire comprising in combination, a pair of elongated body members disposed side by said and pivotally connected together at one end to swing apart to V-relationship in a wire stripping operation, wire clamping jaws on one body member including a fixed jaw on the outer end thereof and a movable jaw slidable lengthwise of said body member toward and away from the fixed jaw, wire stripper blades on the other body member including a fixed blade on the outer end thereof and a movable blade slidable lengthwise of said body member toward and away from the fixed blade, a pair of hand levers, one of which is rigid with and extends from the pivoted end of one body member and the other of which is pivoted relative to the pivoted end of the other body member and extends therefrom, means connecting the pivoted hand lever with said movable jaw and movable blade operating when the hand levers are pressed together to first close the jaws and blades and then swing the body members apart, spring means normally tending to return the body members when swung apart, other spring means tending to swing the pivoted hand lever to retracted position relative to the other hand lever, a catch for locking said body members in open V-relationship, and means on the pivoted handle for moving said catch toward locking position in timed relation to the closing of the handles and releasing said catch in timed relation to the opening of the handles.

17. A wire stripper as set forth in claim **16** in which the last mentioned means operates resiliently in the catch engaging direction and positively in the catch releasing direction.

18. A wire stripper as set forth in claim **16** in which the last mentioned means comprises a spring on the pivoted handle applying resilient pressure on the catch in the catch engaging direction and a projection on the pivoted handle engaging the catch to release it positively.

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