Jan. 20, 1959 S. A. PLATT 2,869,640

TRAVELLING WIRE COIL CUTTER

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Fig. 1.

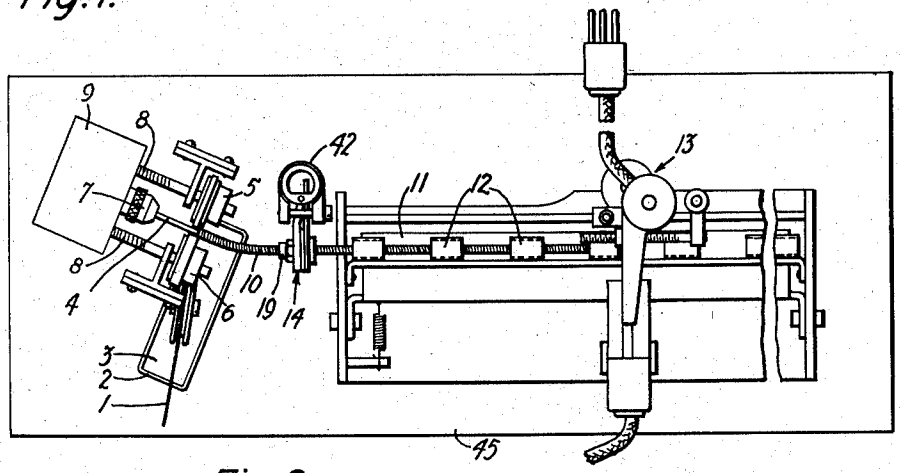
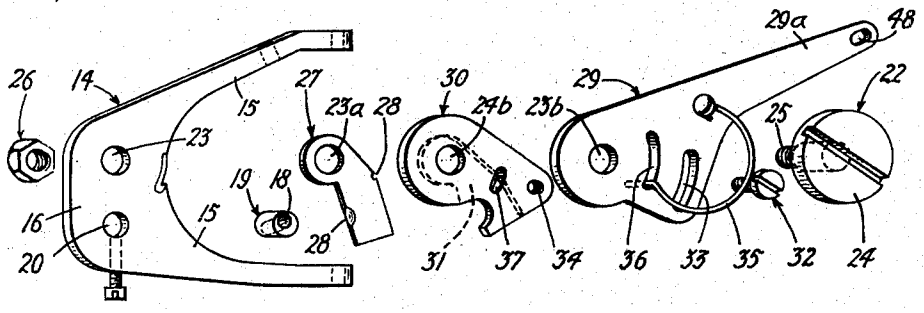


Fig. 2.



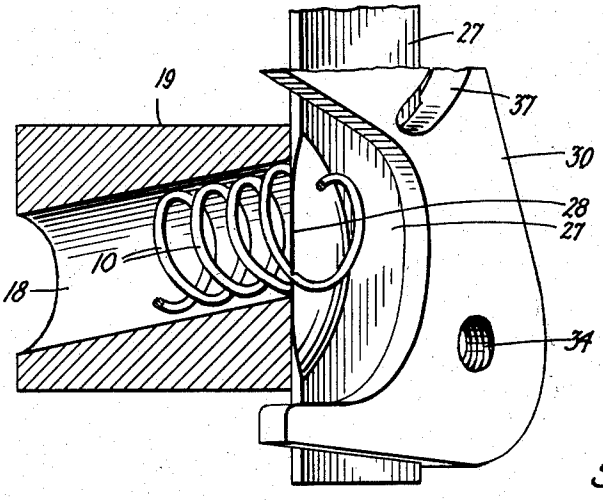


Fig. 3.

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Fig. 4.

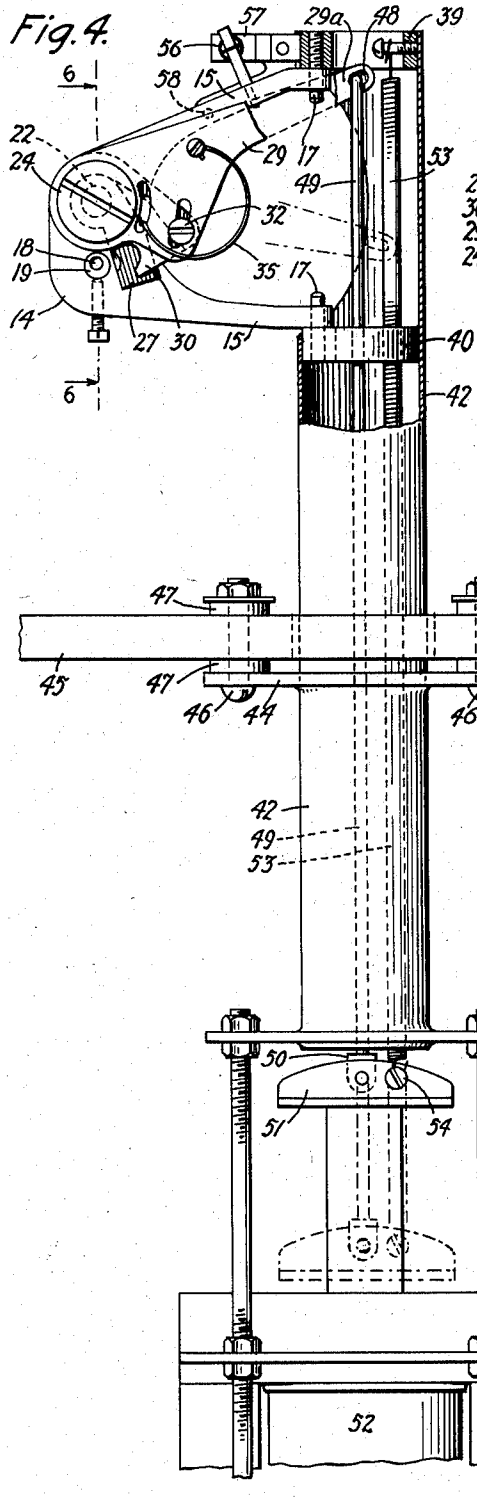


Fig. 5.

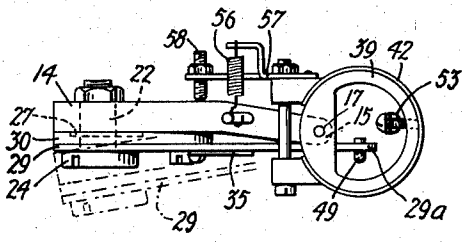
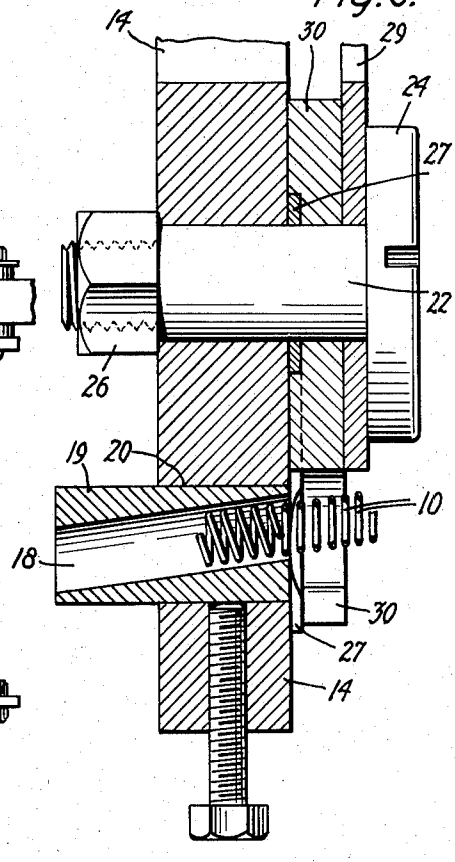


Fig. 6.



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Fig. 7.

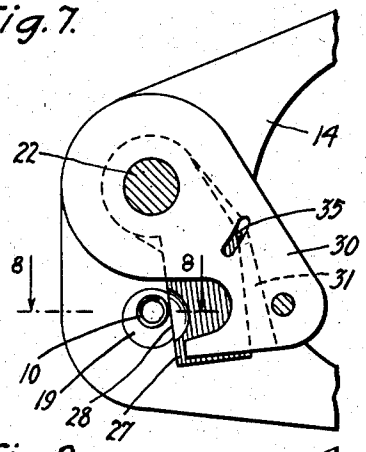


Fig. 8.

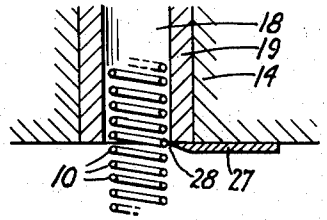


Fig. 9.

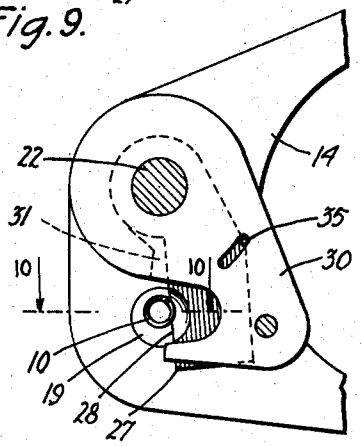


Fig. 10.

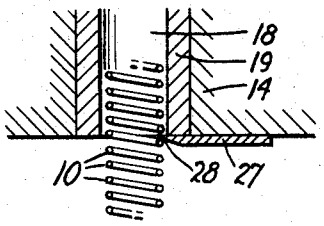


Fig. 11.

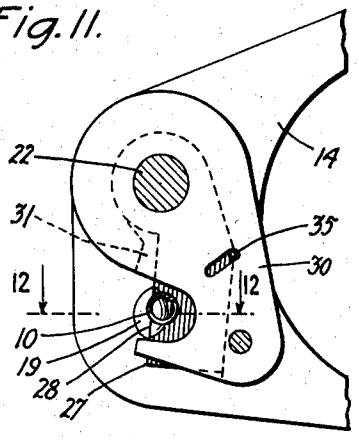
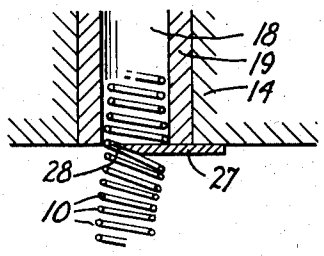


Fig. 12.



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United States Patent Office 2,869,640 Patented Jan. 20, 1959

2,869,640

TRAVELLING WIRE COIL CUTTER

Stephen A. Platt, Grand Haven, Mich.

Application April 5, 1954, Serial No. 421,015

10 Claims. (Cl. 164—43)

This invention relates to the problem of cutting lengths from a wire coil which travels lengthwise while rotating about its axis. The invention is particularly concerned with this problem when the wire is drawn from an alloy of the kind used for electric resistance heating elements and is very easily work-hardened, and when the cut lengths must each have the same electric resistance within a very narrow tolerance range.

A coil of such electric resistance wire is ordinarily produced by coiling the wire on a rapidly rotating mandrel, whereby the coil is produced as a continuously travelling and very rapidly rotating product. The motion of this coil cannot be interfered with very much without introducing trouble at the coiler where the mandrel is located. The lengths should be severed so that they all have the same lengths and this should be done without deforming or nicking the coil convolutions adjacent to the cuts.

One of the objects of the presnt invention is to meet the above requirements in a manner that is more commercially reliable than has heretofore been possible. Other objects may be inferred from the following disclosure of a specific example of one form of the invention which is provided for the purpose of disclosing and explaining the principles. This disclosure is effected by the following description which refers to the accompanying drawings in which:

Fig. 1 is a top view showing the coiler producing the coil and the cutter and its control mechanism;

Fig. 2 is an exploded view showing the component parts of the cutter device per se;

Fig. 3 is a sectioned perspective view showing the action of the cutter;

Fig. 4 is a vertical view showing the cutter and its mounting parts, a portion of the latter being in vertical cross section;

Fig. 5 is a top view of Fig. 4;

Fig. 6 is a cross section taken on the line 6—6 in Fig. 4;

Fig. 7 is a front view of the cutter showing a first phase of the cutting operation;

Fig. 8 is a cross section taken on the line 8—8 in Fig. 7;

Fig. 9 is the same as Fig. 7 excepting that it shows a second phase;

Fig. 10 is a cross section taken on the line 10—10 in Fig. 9;

Fig. 11 is again the same as Fig. 7 excepting that it shows a third phase in the cutting operation; and

Fig. 12 is a cross section taken on the line 12—12 in Fig. 11.

Referring to these drawings, the electric resistance wire being coiled may be of the type designed to operate at high temperatures and which has a composition causing it to work-harden rapidly. It is ordinarily very malleable. These characteristics, together with the requirement that coil lengths of nearly perfect form and free from deformed ends must be produced within very close electric resistance tolerances, makes the processing very difficult.

The wire 1 feeds from a suitable supply continuously under a pulley 2 which is positioned with its lower portion running in a basin 3 containing a liquid lubricant. The wire then travels upwardly to a rapidly rotating mandrel 4 on which it is coiled by powered rotary elements 5 and 6. The mandrel 4 is held in a chuck 7 and this chuck together with rotary flexible shafts 8 for the elements 5 and 6, all project from a powered driving unit 9.

The wire coil 10 leaves the mandrel 4 in a curved path viewed in plan and is necessarily rotating about its axis while it travels forwardly at a linear speed determined by the pitch of its convolutions and its rotating speed. The coil, of course, travels forwardly in the fashion of a screw because of the manner in which the coil is helically wound. The coil may rotate at speeds of over 4,000 R. P. M., yet it must be cut to precise lengths with sharp and cleanly defined cuts and without damaging any of the convolution in any way.

The coil feeds horizontally over a table 11 on which the coil is positioned by retainers 12. A photo-electrically-operated device, generally indicated at 13, is located relative to the table to actuate an electric circuit for the purpose of controlling the actutaion of the cutter which then severs the length desired from the coil 10. The table 11 is made to retract momentarily to drop the severed coil length.

The present invention embodies a new method which embraces the coiling of the wire by using a liquid lubricant, such as a soapy water, an emulsion of oil lubricant and water, and the like, so that the coil arrives at the cutting location with its wire convolutions coated with this liquid lubricant. Each desired length is cut from this coil with a sharp-edged blade by supporting one side of the coil against retreating from the blade while forcing the sharp edge of the blade transversely against the opposite side of the coil. This force is proportioned so that it is initially insufficient to deform or cut the coil but is sufficient to cause the blade's sharp edge to yieldingly feel its way between the coil's liquid-lubricated convolutions. There is always a chance that the sharp edge of the blade will initially engage squarely with the outside of one of the coil's convolutions, and by the use of the yielding or limited force the motion of the blade is permitted to hesitate until the coil slips to one side or the other from the center line of the convex side of the wire forming the convolution initially engaged. During this time the coil is rapidly rotating and is not damaged in any way, and while the blade feels its way between turns or convolutions the coil can screw itself past the blade without moving the latter in the travelling direction of the coil. The lubrication further contributes substantially towards preventing the wire coil from being harmed. At this point the force applied to the blade is rapidly or suddenly increased so as to cause the sharp edge to pass through the coil between turns and cut through the supported side of the coil where there is no danger of deforming the coil as there is on the latter's unsupported side. The blade is then rapidly withdrawn to a location free from the coil. The initial force applied to the blade is of an elastically yielding nature and when the time comes for cutting this force is suddenly increased by applying a hammer-like impact to the blade.

With the above in mind, the cutter, illustrated by the drawings, comprises a horizontally extending bracket 14 having opposed end portions 15 and 16, respectively. The end portion 15 is formed by upper and lower arms having vertically aligned holes through which anchored pivot pins 17 are arranged to mount the bracket pivotally

on a vertical axis so that the bracket's other end **16** swings horizontally. The pivot pins **17** are, of course, vertically aligned.

The swinging end **16**, of the bracket **14**, has a hole **18** formed therethrough substantially tangentially with respect to this portion's swinging motion. The coil **10** is fed through this hole **18**.

As illustrated the hole **18** is preferably formed through a die **19** which is removably mounted in a hole **20**, formed in the bracket **14**, and which is releasably locked in position by a screw **21**. The hole **18** is made just slightly larger in diameter than the coil **10**, and a plurality of dies, such as the die **19**, may be provided, each with a die hole of a different size for accommodating coils of different sizes, size having reference to diameter.

A pivot **22** is mounted on the bracket adjacent to the hole **20** in which the die **19** is mounted. This pivot extends through a hole **23** formed in the end portion **16** of the bracket, the pivot having an enlarged head **24**, provided with a screwdriver slot, and a threaded opposite end **25** on which a nut **26** is secured to mount the pivot **22**.

The cutting is effected by a very light-weight knife blade **27** which is pivoted on the pivot **22** and has a sharp edge **28** which swings transversely past the opening to the die hole **18** so as to cut the coil as it leaves the hole **18**. A relatively heavy lever **29** is pivoted on the pivot **22** so as to swing concentrically with respect to the blade **27**, and the two are interconnected by a lost-motion means. This means is shown as comprising an intermediate lever **30**, also pivoted on the pivot **22**, and which has a pocket **31** in which the blade **27** is fitted so that it may swing for a limited extent relative to the intermediate lever **30**. This lever **30** is in turn adjustably fixed rigidly with respect to the lever **29** by a screw **32** which passes through an arcuate slot **33** formed in the lever **29** concentric with respect to the pivot **22**, the screw **32** extending into a threaded hole **34** formed in the intermediate lever **30**. When the screw **32** is tightened in the hole **34** the levers **29** and **30** are clamped together relatively immovably.

As illustrated, the blade and each of the two levers have holes **23***a*, **23***b* and **24***b*, respectively, through which the pivot **22** passes.

The blade **25** is biased gently towards its advancing position by a relatively large diameter loop of spring wire **35** having one end fixed to the lever **29** and its other end bent inwardly and extending through arcuate slots **36** and **37**, formed through the two levers **29** and **30**, respectively, and so as to abut behind the blade **27** with respect to which the spring end is located by a notch **38** formed in the back of the blade.

Preferably the die hole **18** is inclined with respect to the axis of the die **19** and the hole **20**, so that the coil convolutions on the side of the hole closest to the knife blade are substantially parallel to the front surface of the die and of the bracket over which the blade **27** slides within the confines of the recess **31** formed in the intermediate lever **30**.

The pivot pins **17** project towards each other and are mounted by two vertically interspaced rings **39** and **40** which are secured inside of a vertical tube **42** having a transverse window **43** formed therethrough and through which the bracket transversely extends. This tube **42** serves as a mount for the cutter, the tube having a flange **44** by which it is secured through a hole formed in a worktable **45** which is suitably mounted horizontally. The flange **44** is preferably secured to the table by screw fastenings **46** which engage the opposite sides of the table through elastically deformable shock absorbing washers **47**.

The lever **29** advances the blade **27** for cutting, and the swinging end **29***a* of this lever is provided with a transverse hole **48**. A connecting rod **49** connects with the lever by an end which passes loosely through the hole **48**, the latter being elongated radially with respect to the pivot **22**, and this rod **49** depends down through the tube substantially vertically to a remote location below the table **45**, where the lower end of the rod is secured, by a connection **50** (with the armature **51** of a commercial magnetic device having a reciprocating solenoid **52** which, when energized, draws the armature **51** downwardly with great force and speed. It should be noted that the end **29***a* of the lever **29**, and the hole **48**, are located quite close to the pivot pins **17**, the rod **49** being correspondingly close and descending substantially vertically and substantially parallel to the common vertical axis of the two pins **17**.

A long coil spring **53** has its upper end anchored to the ring **39** and its lower end connected, at **54**, with the armature **51**. This counterbalances the weight of the rod **49**, of the armature **51** and of the lever **29**, and in addition biases the lever arm **29** upwardly to a location determined by the distance that the armature **51** may be pulled upwardly, the upward stroke of this armature being limited.

While actually cutting the coil the cutter must act as a flying shear or cutter so as to avoid impeding the lengthwise travel of the coil. It is for this reason that the bracket is pivotally mounted by the pivot pins **17**. The bracket is biased to swing oppositely to the coil's travelling direction by a coil tension spring **56** which is secured to a bracket **57** extending from the top of the tube **42**. The horizontal swinging forward limit of the bracket is fixed by an adjustable stop **58** which is screwed through the end of the bracket **57** so as to be engaged by the bracket **14** when the latter is pulled forwardly by the spring **56**.

The importance of the arrangement of the parts, described hereinabove, and the degree of the elasticity of the spring **35**, and the relative weights of the blade **27** of the lever **29**, may best be emphasized in connection with the description of the operation of the described apparatus. This operation, whereby the described method is effected mechanically rather than in some other fashion, will now be described. In operation:

The described cutter is initially set-up so that the sharp edge **28** of the blade **27** just safely clears the coil leaving the described coiler and travelling lengthwise, while rotating rapidly, through the die hole **18**. The coil is coated with liquid lubricant as previously described. The location of the knife blade is fixed by proper setting of the angular relation between the levers **29** and **30** by appropriate use of the screw **32**. The blade **27** is, of course, biased forwardly by its spring **35**. With this set-up the coil is cut whenever the solenoid **52** is energized under the control of the device **13** previously mentioned. When energized the armature **51** is jerked downwardly at great speed. Due to the great length of the coil spring **53** the latter exerts a pull of relatively constant value, and, therefore, the armature **51** does not meet greatly increasing resistance exerted by this spring **53** as the latter expands.

It is to be noted that the coil of resistance wire can be supported against the action of the cutting blade only on the side of the coil opposite to this blade. All of its other portions are unsupported respecting the force which must be applied by the blade to the coil to effect cutting. This is one of the things that makes the cutting problem so severe, because the application of cutting force to the coil anywhere excepting directly opposite to its convolution portion which can be supported, results in deformation of the coil.

In the case of the present invention the first action is as shown by Figs. 7 and 8 where the sharp edge **28** of the blade **27** is initially engaging the unsupported side of the coil **10**. The manner of initial engagement is a matter of chance and the worst possible condition is when the sharp edge engages squarely with the convex surface of

the cross section of the one of the wire convolutions. This condition is illustrated by these Figs. 7 and 8.

The velocity of the cutting motion is so great that the weight of the parts must be considered. This has been done in the case of the present invention, the blade **27** being thin and light in weight, its actual weight being adjusted so that at the velocity with which the blade is moved the resulting force, plus the force exerted by the spring **35**, is insufficient to nick the wire or deform the coil shape, even under the illustrated conditions. This means that the spring **35** must exert just a gentle force to the blade which is at most insufficient to result in the coil being nicked or deformed.

The motion of the blade **27** momentarily ceases while the lever **29** continues to descend at high speed. The coil **10** is rapidly rotating and is subject to vibration which very quickly causes the coil turns or convolutions to slip ahead of or behind the squarely engaged convolution, the elasticity of the spring **35** being adequate to urge the blade **27** continuously forwardly. The liquid lubricant on the coil assists in this action and the rapid rotation of the coil works with the lubrication to prevent any appreciable nicking or premature cutting of the coil.

The next phase is shown by Figs. 9 and 10 where the sharp edge **28** has slipped between the coil convolutions. The elasticity of the spring **35** must be sufficient to cause the blade to index between the convolutions during this action, but the elasticity should not be substantially greater than this small amount. During this time the coil screws itself over the blade so that no forward force is exerted on the blade and the bracket **14** is not required to swing. There is little resistance to the coil's rotation and, of course, no resistance to its forward or lengthwise travel. Remembering that the lever **29** has been all the time descending at very high velocity, the lost motion, provided by the recess **31**, is taken up with tremendous speed and the entire force resulting from the weight and speed of the lever **29** and the intermediate lever **30** is applied solidly to the back edge of the blade **27** with a hammer-like blow which quickly and cleanly drives the sharp edge **28** through the coil, between convolutions, and cutting through at the support side of the die hole **18**. The solenoid **52** is energized momentarily, so almost immediately the spring **53** raises the lever **29** and rapidly withdraws the blade **27** to a location where its sharp edge **28** clears the coil.

During the brief interval that the blade passes through the coil and the coil is nipped between the blade and the die, both its rotation and lengthwise travel are halted. Due to the great rotative speed, the nipped convolution confined inside of the die hole **18**, expands slightly and braces itself solidly inside of the die so as to further assure a clean cut. During this brief action the bracket **16** swings or flies with the work with the result that the latter's travel, with respect to the mandrel of the coiler, continues. The momentary halt in its rotation is taken up by the length of the coil **10** between the cutter and the coiler without damage to the coil and without causing trouble at the coiler.

During the necessary swinging of the bracket **14** it is important to avoid any resistance to the swinging action. This is why the rod **49** is located as close to the axis of the pins **17** as is physically possible, this bringing all necessary connections to a substantially common pivotal axis. This also dictates the general design of the cutter so the heavy parts do not affect the swinging action of the cutting head. The movement of the bracket **14** is very small in any event, due to the rapidity with which the blade is advanced and withdrawn.

This final cutting phase is shown by Fig. 3 as well as by Figs. 11 and 12. Fig. 3 has the advantage that it more clearly shows the manner in which the nipped convolution momentarily expands and braces itself within the die hole **18**.

The importance of maintaining the blade **27** very light, and in accurately proportioning the elasticity and form of the spring **35**, should now be realized. It makes possible the great speed of action described hereinabove, because in spite of the high velocity the blade **27** cannot damage the coil as the blade engages the latter and feels its way along to the solidly supported side of the coil where the cutting may be effected cleanly and without damage to the coil's form. The extremely rapid but at the same time gentle and hesitating blade feeling action, is at the appropriate time automatically followed by the heavy cutting blow and the rapid withdrawal.

It follows from the foregoing that in spite of the work-hardening properties and malleability of most if not all electric resistance heating wire alloys, that the coils are severed without working the wire so as to work-harden it and without deforming or nicking the coil at the severed portion.

It is to be noted that the blade and levers swing forwardly and backwardly, or, in other words, that they are reciprocative. The pivot **22** is tangentially arranged with respect to the swing of the bracket **14** about the vertical axis fixed by the pivot pins **17**. The lever **29**, of course, swings in a vertical plane substantially parallel to this just-mentioned vertical axis. The rear face of the wall defining the pocket **31** abuts squarely and solidly with the rear edge of the blade **27** so as to deliver the impact which has been described. Although two pins **17** have been described they cooperatively function to form a single pivot, as though only one pin was used.

I claim:

1. A cutter for a wire coil which travels lengthwise while rotating about its axis, said cutter including a support for transversely supporting one side of the coil, a reciprocating blade having a sharp edge, and means for advancing said blade with an initial force which is insufficient to deform or cut said coil but is sufficient to cause said edge to feel its way between the coil's convolutions at said opposite side which force then increases so as to advance said edge through the coil to said supported side and cause said edge to cut said coil at said supported side thereof, said means comprising an element having means for moving it to advance said blade with said increased cutting force, means for interconnecting said element and blade with a lost motion therebetween, and an elastic means resisting said lost motion with said initial force.

2. A cutter for a wire coil which travels lengthwise while rotating about its axis, said cutter including a support for transversely supporting one side of the coil, a reciprocating blade having a sharp edge, and means for advancing said blade with an initial force which is insufficient to deform or cut said coil but is sufficient to cause said edge to feel its way between the coil's convolutions at said opposite side, which force then increases so as to cause said edge to advance through the coil to said supported side to cut said coil at said supported side thereof, said means comprising an element having means for moving it to advance said blade with said increased cutting force, means for interconnecting said element and blade with a lost motion therebetween, and an elastic means resisting said lost motion, said initial force being derived from the elastic force of said elastic means and the momentum of said blade, said element moving means moving said element at predetermined velocity and said blade having a weight which is less than would cause said blade; moving at said velocity to exert a force which, when added to the elastic force of said elastic means, would be sufficient to deform or cut said opposite side of said coil upon initially engaging the same.

3. A cutter for a wire coil which travels lengthwise while rotating about its axis, said cutter including a support for transversely supporting one side of the coil, a reciprocating blade having a sharp edge, and means for advancing said blade with an initial force which is insufficient to deform or cut said coil but is sufficient to

cause said edge to feel its way between the coil's convolutions at said opposite side, which force then increases so as to cause said edge to advance through the coil to said supported side to cut said coil at said supported side thereof, said means comprising an element having means for moving it to advance said blade with said increased cutting force, means for interconnecting said element and blade with a lost motion therebetween, and an elastic means resisting said lost motion, said initial force being derived from the elastic force of said elastic means and the momentum of said blade, said element moving means moving said element at predetermined velocity and said blade having a weight which is less than would cause said blade moving at said velocity to exert a force which, when added to the elastic force of said elastic means, would be sufficient to deform or cut said opposite side of said coil upon initially engaging the same; said element being substantially heavier than said blade and said inter-connecting means forming rigid interengaging surfaces for said blade and element respectively so that said element delivers a hammer-like impact to said blade after taking up said lost motion.

4. A cutter for a wire coil which travels lengthwise while rotating about its axis, said cutter including a support for transversely supporting one side of the coil, a reciprocating blade having a sharp edge, and means for advancing said blade with an initial force which is insufficient to deform or cut said coil but is sufficient to cause said edge to feel its way between the coil's convolutions at said opposite side which force then increases so as to cause said edge to advance through the coil to said supported side to cut said coil at said supported side thereof, said coil screwing itself through said blade while the latter is entered therein prior to cutting the coil, means for returning said blade to a location clearing said coil after the blade has cut the latter, and means for mounting said blade reciprocatively and so that it can fly with said coil while the blade is cutting the latter and is being returned to said location.

5. A cutter for a wire coil which travels lengthwise while rotating about its axis, said cutter including a support for transversely supporting one side of the coil, a reciprocating blade having a sharp edge, and means for advancing said blade with an initial force which is insufficient to deform or cut said coil but is sufficient to cause said edge to feel its way between the coil's convolutions at said opposite side which force then increases so as to cause said edge to advance through the coil to said supported side to cut said coil at said supported side thereof, said support comprising a die having a passage slightly larger in diameter than the coil and through which the latter travels, said blade momentarily anchoring said coil against rotation while cutting the coil and thus causing the coil's convolution in front of the blade to expand, due to slight unwinding, and brace itself against the inside of said passage.

6. A cutter for travelling work and including a bracket, a movable blade mounted on said bracket, means for mounting said bracket so that it swings about an axis spaced from said blade when the latter engages the work, a lever pivotally mounted on said bracket and swinging therewith, said lever having one end connected to move said blade and the other end extending to a location adjacent to and spaced from said bracket mounting means, a connecting rod connected to said lever's last named end and extending therefrom substantially parallel and adjacent to said axis, and means for moving said rod linearly and which is located remotely from said bracket.

7. A cutter for a wire coil which travels lengthwise while rotating about its axis, said cutter comprising a horizontally extending bracket having opposed end portions, means for pivotally mounting one of said end portions on a vertical axis so that the other of said end portions swings horizontally, said other or swinging end portion having a hole formed therethrough substantially tangentially with respect to this portion's swinging motion and through which said coil is fed, a pivot mounted on said bracket adjacent to said hole and substantially tangentially arranged with respect to said swinging portion's motion, a light-weight knife blade pivoted on said pivot and having a sharp edge swinging transversely past one of said hole's openings so as to cut the coil passing therethrough, a relatively heavy lever pivoted on said pivot, lost-motion means for interconnecting said blade and lever, and an elastic means for resisting the movement of said blade within the limits of said lost-motion means, said lever having an end portion extending to a location at least adjacent to said axis and swinging in a plane substantially parallel to the latter, said lever solidly engaging said blade when the latter's said edge solidly engages the coil so as to overcome the resistance of said elastic means and sever said coil.

8. A cutter for a wire coil which travels lengthwise while rotating about its axis, said cutter comprising a horizontally extending bracket having opposed end portions, means for pivotally mounting one of said end portions on a vertical axis so that the other of said end portions swings horizontally, said other or swinging end portion having a hole formed therethrough substantially tangentially with respect to this portion's swinging motion and through which said coil is fed, a pivot mounted on said bracket adjacent to said hole and substantially tangentially arranged with respect to said swinging portion's motion, a light-weight knife blade pivoted on said pivot and having a sharp edge swinging transversely past one of said hole's openings so as to cut the coil passing therethrough, a relatively heavy lever pivoted on said pivot, lost-motion means for interconnecting said blade and lever, and an elastic means for resisting the movement of said blade within the limits of said lost-motion means, said lever having an end portion extending to a location at least adjacent to said axis and swinging in a plane substantially parallel to the latter, said lever solidly engaging said blade when the latter's said edge solidly engages the coil so as to overcome the resistance of said elastic means and sever said coil, and a connecting rod connected to said lever's said end portion and extending substantially vertically and parallel with respect to said axis and having an end portion remote from said bracket, and powered means connected to said rod's end portion for moving said rod linearly to swing said lever, and a spring connected to said rod and said lever's end portion and to said powered means so as to counterbalance their weight and bias said lever's end portion to retract said blade relative to said hole.

9. A cutter for a wire coil which travels lengthwise while rotating about its axis, said cutter comprising a horizontally extending bracket having opposed end portions, means for pivotally mounting one of said end portions on a vertical axis so that the other of said end portions swings horizontally, said other or swinging end portion having a hole formed therethrough substantially tangentially with respect to this portion's swinging motion and through which said coil is fed, a pivot mounted on said bracket adjacent to said hole and substantially tangentially arranged with respect to said swinging portion's motion, a light-weight knife blade pivoted on said pivot and having a sharp edge swinging transversely past one of said hole's openings so as to cut the coil passing therethrough, a relatively heavy lever pivoted on said pivot, lost-motion means for interconnecting said blade and lever, and an elastic means resisting the movement of said blade within the limits of said lost-motion means, said lever having an end portion extending to a location at least adjacent to said axis and swinging in a plane substantially parallel to the latter, said lever solidly engaging said blade when the latter's said edge solidly engages the coil so as to overcome the resistance of said elastic means and sever said coil, said bracket's swinging end portion swinging with the coil's travel during cut-

ting action of said blade, and a stop for locating said swinging end portion and a spring arranged to bias said swinging end portion against said stop.

10. A cutter for a wire coil which travels lengthwise while rotating about its axis, said cutter comprising a horizontally extending bracket having opposed end portions, means for pivotally mounting one of said end portions on a vertical axis so that the other of said end portions swings horizontally, said other or swinging end portion having a hole formed therethrough substantially tangentially with respect to this portion's swinging motion and through which said coil is fed, a pivot mounted on said bracket adjacent to said hole and substantially tangentially arranged with respect to said swinging portion's motion, a light-weight knife blade pivoted on said pivot and having a sharp edge swinging transversely past one of said hole's openings so as to cut the coil passing therethrough, a relatively heavy lever pivoted on said pivot, lost-motion means for interconnecting said blade and lever, and an elastic means resisting the movement of said blade within the limits of said lost-motion means, said lever having an end portion extending to a location at least adjacent to said axis and swinging in a plane substantially parallel to the latter, said lever solidly engaging said blade when the latter's said edge solidly engages the coil so as to overcome the resistance of said elastic means and sever said coil, said pivotal mounting means comprising a vertical tube having a transverse window formed therethrough and mounting a vertical pin on which said bracket's pivoted end is mounted, said pin being located inside of said tube adjacent to said window and said lever's end portion projecting through said window and said connecting rod extending longitudinally through the inside of said tube, and means for mounting said tube in an upstanding position.

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