United States Patent [19]

Anderson

[11] **3,722,861**

[45] **Mar. 27, 1973**

[54] **FENCING**

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[22] Filed: **May 28, 1969**

[21] Appl. No.: **828,598**

[30] **Foreign Application Priority Data**

May 30, 1968 Australia 38586/68

[52] **U.S. Cl.** **254/64,** 254/83, 256/37

[51] **Int. Cl.** **B65h 75/30,** B66f 3/00

[58] **Field of Search** 29/452; 256/1, 2, 11, 37, 39; 242/86.5; 254/64, 83, 134.3; 140/123.5

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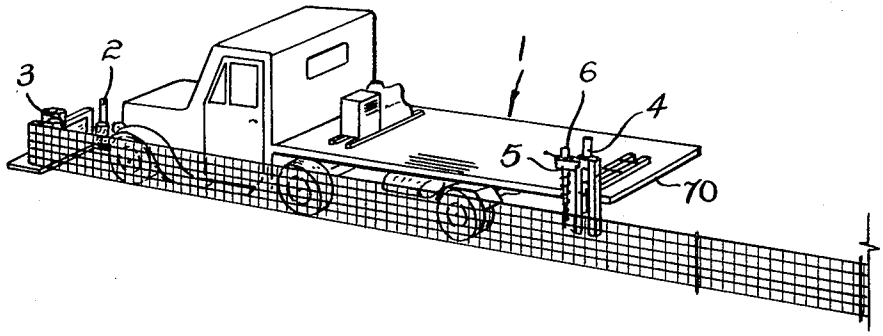
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[57] **ABSTRACT**

The disclosure relates to a fencing device in which a transport moves along the line of fencing and feeds the wires which are to form the line of fencing under tension once fencing is commenced. The posts are positioned by driving means along the line of strip wire and the wires are tied to the posts while the tension is maintained. The tension is maintained by braking means either on a drum which carries the wire or on separate means over which the wire passes and the tension means are so arranged that the force on this tension drum or means is measured by springs so arranged that the brakes are applied until the required tension is reached whereupon the brakes are progressively released to maintain the tension, control being such that the tension is maintained whether the vehicle moves forwardly during the playing out of the wire or is stationary during the driving of the posts.

9 Claims, 8 Drawing Figures



Patented March 27, 1973 3,722,861

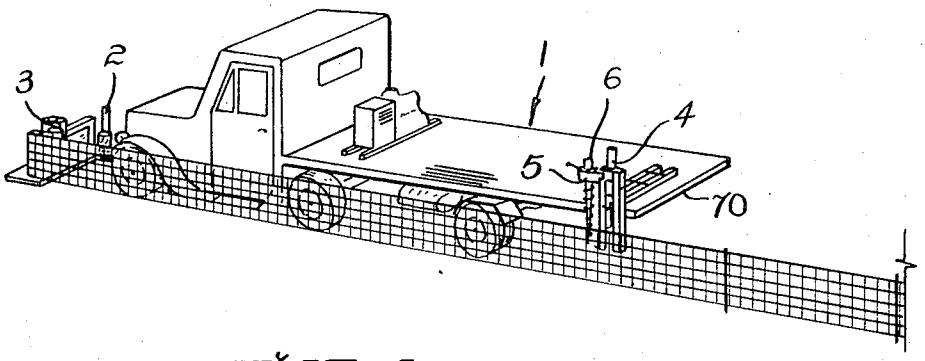


FIG 1

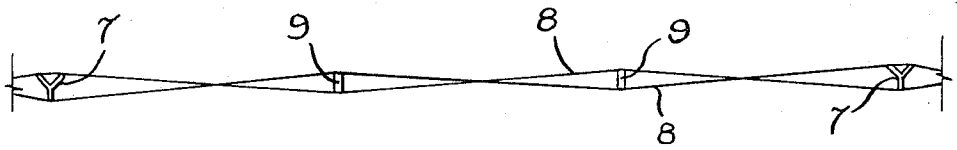


FIG 2

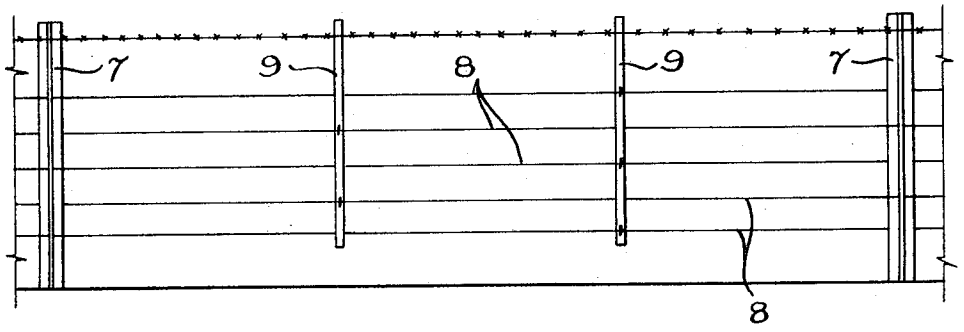


FIG 3

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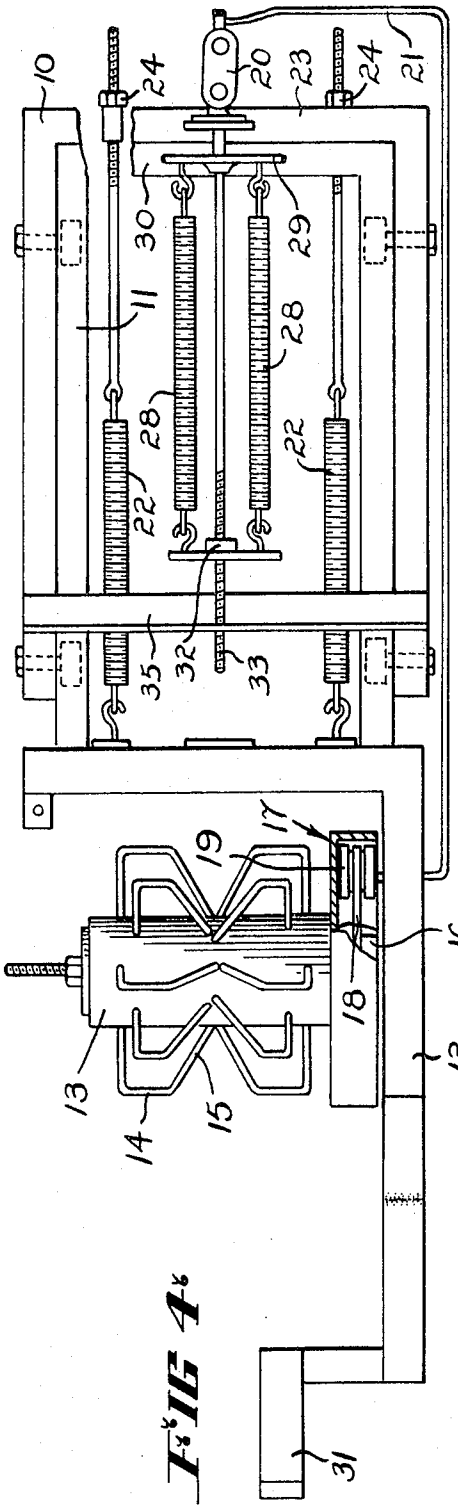


FIG 4

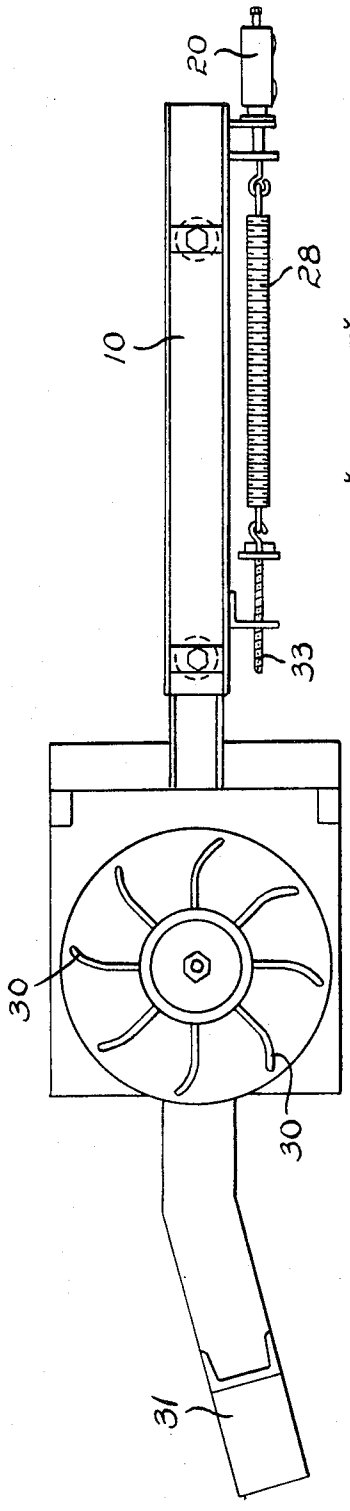
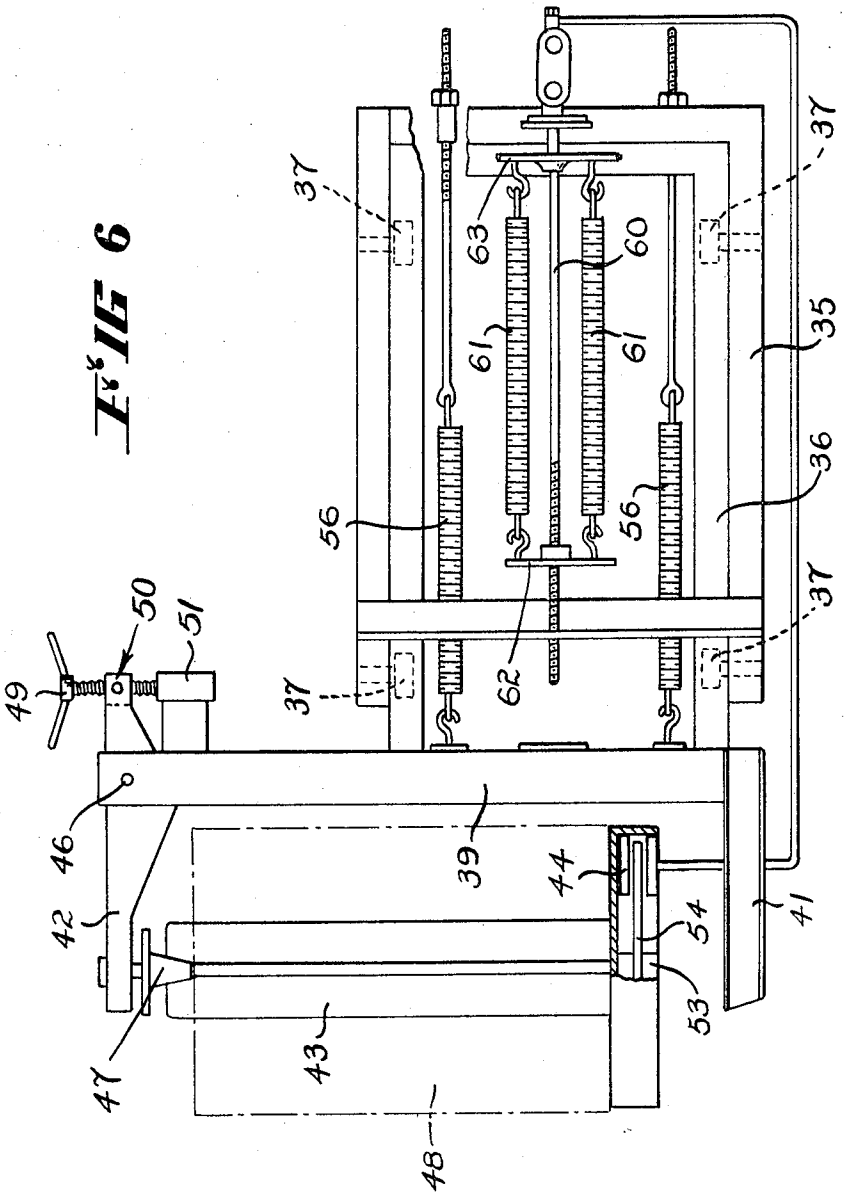


FIG 5

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FIG 6



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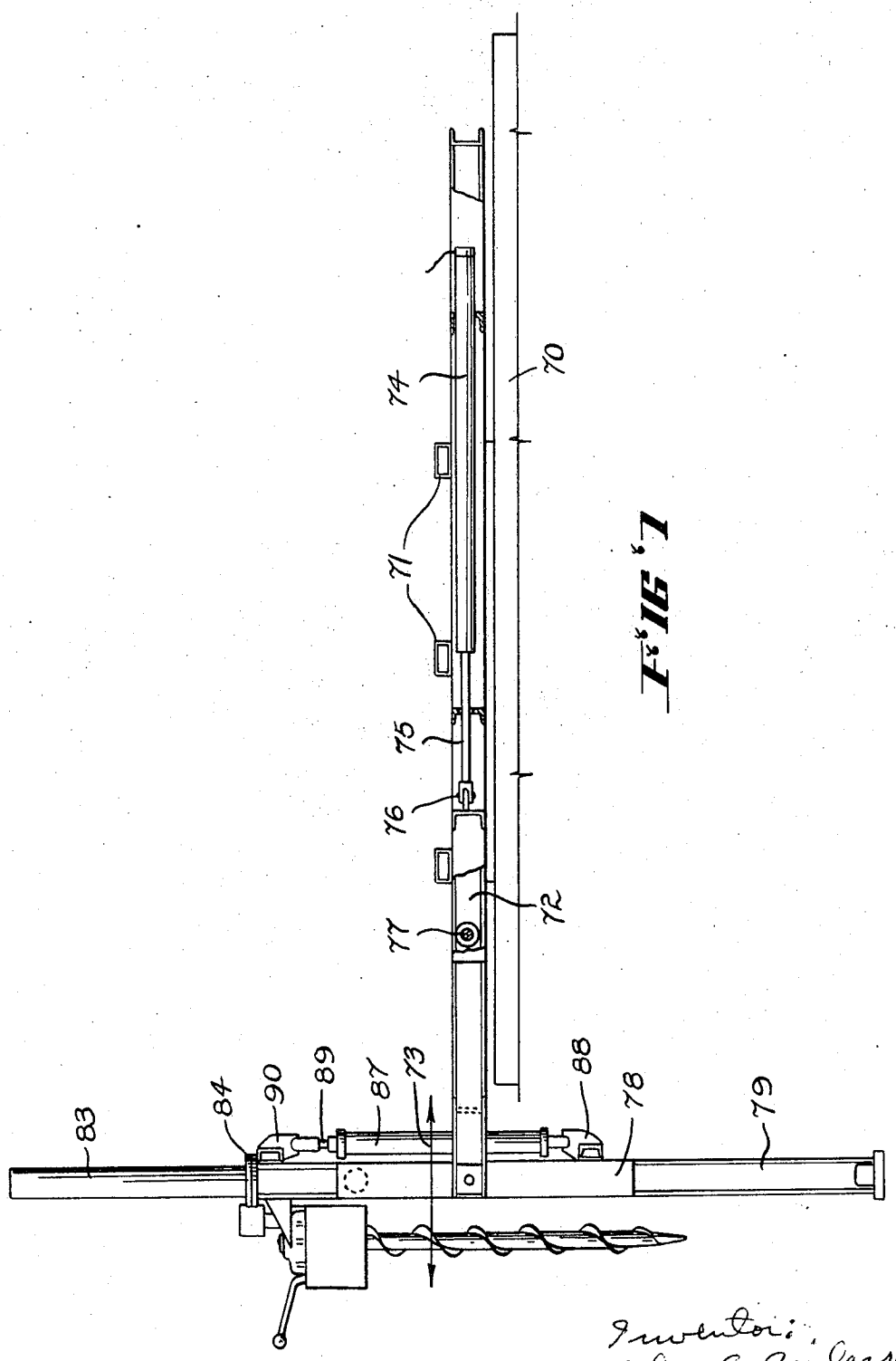


FIG. 1

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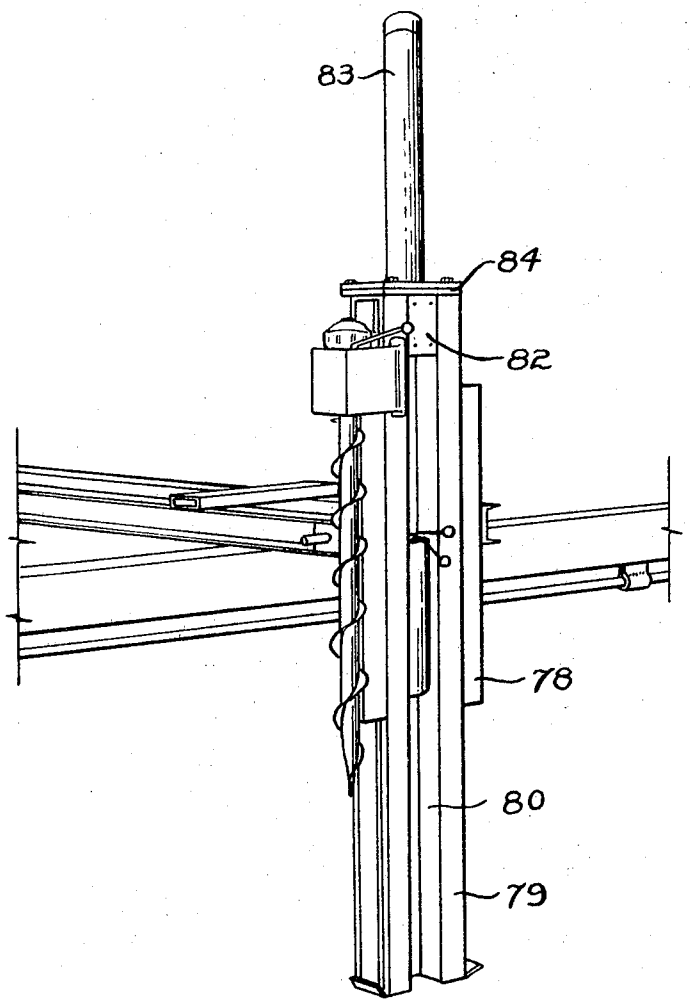


FIG 8

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FENCING

This invention relates to improvements in and to fencing and in particular it relates to fencing of the type which uses metal posts which can be driven into the ground at required spacing and the fencing then attached thereto.

Posts of this type are already well known and can for instance comprise steel members having a cross-section in which three radiating webs are used, to form what is termed a "star" post but problems in fencing with these units usually are the need to stabilize considerable length of fencing between strainer posts and also to prevent lateral displacement of these relatively thin posts against the pressure exerted by cattle or the like.

According to my invention the previously existing problems are overcome by using posts which can be driven into the ground by means of a power tool or the like and by laterally stabilizing the posts along a line of fencing by attaching the wires to these posts while they are tensioned so that the fence is stabilized in the line of the fencing by the tension on the wires themselves.

In this way for instance the wires can be carried on suitable reels or the like on a conveyance which can move along the line of the fence, the reels, or members over which the wire passes, being provided with braking means to maintain the wires under the correct tension, the posts being then driven in by means of a suitable power tool and when securely engaged in the ground the pretensioned wires are tied to the posts in such a manner that the tension on the wires is maintained from post to post, this method being continued along the line of fencing so that as the fencing is being erected, the posts are being engaged in the ground and the wires tied to them to maintain the tension along the fence.

In this way the complete fence is stabilized in that all posts are maintained in their proper upright position with the wires tensioned along the line of fencing.

Thus according to this invention a line of fencing may be constructed using for instance steel posts or "star" cross-section or the like with the required number of plain and barbed wire strands or fabricated mesh, the required lateral stability being attained at required intervals by using raking steel posts welded or clamped to the vertical posts to act as struts, only intermediate posts being strutted where necessary for lateral stability.

Stability for the posts along the axis of the fence may be provided by positioning alternate wires on opposite sides of each post and looping the wire around adjacent posts on opposite sides, the wires being tied to the post so that there can be no movement of the post in relation to the wire in the plane of the fence.

Intermediate wooden or similar droppers or wire spacers may be used.

The fence may be constructed by driving the posts with an appropriate power tool, either directly or after drilling a smaller hole, and with the forward movement of the plant the wire strands or rolls of mesh are fed from the coils at the required tension and tied to each post, the tension mechanism being provided by a friction or other type of brake operating on each spool which carries the coils of wire.

In order however that the invention may be more fully understood embodiments thereof will now be described with reference to the accompanying drawings but it is to be clear that the invention need not necessarily be limited to these. The drawings generally refer to a transport by means of which the wire can be applied to posts which are driven by a mechanism on the transport, and the general principle of the invention will be seen to consist in the tensioning of the wires whether they be barbed wires or ordinary wires or wire fabric, in such a manner that tension is applied which is maintained during the positioning and driving of the post and the wire is then tied to the post to rigidly hold same in position and to give a pretensioned fence.

In the drawings,

FIG. 1 shows schematically a transport carrying the various mechanisms by means of which a wire fence can be erected according to this invention, showing it used as when erecting a wire fabric fence,

FIG. 2 shows in plan how posts of what is commonly termed "star" cross-section can be positioned with plain fencing wires as opposed to fabric, attached thereto but crossing over from side to side, intermediate spacers for the wires being shown,

FIG. 3 is a side elevation of FIG. 2,

FIG. 4 shows a mechanical tensioning mechanism by means of which the necessary tension can be applied to wires and maintained irrespective of the forward motion of the vehicle which supports the unit, this form of the device using spring tension to control the actual tension on the wire,

FIG. 5 is a plan of FIG. 4,

FIG. 6 is a view similar to FIG. 4 but showing how woven wire can be supported on a reel and tensioned by spring control to maintain the necessary braking force on the wire to maintain the tension at all times,

FIG. 7 is a view showing the post driver, indicating in particular the tray of the vehicle with the projection mechanism thereon which allows the post driver to be moved outwardly or inwardly in relation to the vehicle to maintain proper fence alignment, and

FIG. 8 is a perspective view of the post pressing head and post guide which forms the operative post engaging mechanism of FIG. 7.

Referring first to FIG. 1 it will be noted that a transport 1 carries on it a wire tensioning mechanism 2 which can handle barbed wire or plain wire or the like, a tensioning member 3 for wire fabric, and a post driving positioning mechanism 4 by means of which the posts are located.

5 indicates a post hole borer which can be positioned to the side of the post driver 4 in case it is desired to predrill a hole of a somewhat smaller diameter than the post which is to be driven into the ground, this borer being driven by a hydraulic motor 6 but being arranged to be swung out of position when not required.

It will be realized of course that the various mechanisms shown can have their position in relation to the vehicle substantially varied and it is not necessary to use a vehicle as the various mechanisms could be welded on a trailer or trailers in proper sequence to effect the necessary supplying and tensioning of the wire or fabric and the post positioning and fixing of the wire thereto.

In FIGS. 2 and 3 is shown how posts 7 can be positioned, indicating wires 8 which are passed around alternate sides of the posts 7 prior to tying thereto for

better wire control, and also alternate spacing along the posts, but hereagain it is not necessary to use this alternate positioning as all wires can be tied to a post on one side thereof. Spacers **9** can be interposed at suitable intervals between the posts **7**.

Referring now to the tensioning mechanism shown in FIGS. **4** and **5** it is to be noted that a frame **10** is fixed to the vehicle in any convenient manner and supports on it a slidable frame **11** having on it a bracket **12** which carries a wire tensioning drum **13** having a series of shaped staggered outwardly positioned wire engaging members **14** around which drum the wire from a supply reel, not shown, can be passed, and because of the staggered relationship of the inner ends **15** of the wire engaging members **14** this wire is gripped by the tensioning drum and is pulled taut but as the vehicle moves forward the drum can rotate on a central shaft **16** against the action of a brake **17** to maintain the tension of the wires of the fence as it is being placed into position at a required value. The brake comprises a disc **18** and hydraulic pressure members **19**.

To control this tension, the wire, as will be realized, in passing around the wire tensioning drum **13** will have a tension exerted thereon due to brake action.

The brake action is controlled from a master cylinder **20** connected by a line **21** to the pressure members **19** of the disc brake being urged down on to the disc **18** by a spring assembly now to be described.

Springs **22** secured to a forward bar **23** of the fixed frame **10** but provided with tension adjusting nuts **24** so that the position of the slidable frame **11** in relation to the frame **10** will be regulated by the pull on the drum due to the wire.

To provide a brake pressure which normally holds the brake **17** in engagement, a pair of springs **28** are used which have one end attached to a bracket **29** secured to the forward frame bar **30** of the slidable frame **11** and their other ends secured to a plate **31** which bears against a tension adjusting nut **32** on a rod **33** which is the pressure supply rod for the master cylinder **20** of the braking system.

The rod **33** is guided in an aperture in the bar **35** on the fixed frame **10** and slides freely through the bracket **29**.

In this way the normal pressure required to hold the disc **18** against rotation is generated by the springs **28**, but when tension on the drum **13** is increased sufficiently by the pull of the wires due to the forward movement of the vehicle **1**, the movement of the slidable frame **11** against the springs **22** releases tension on the springs **28** due to the forward frame bar **30** moving back.

In this way any required tension adjustment on the brake **17** and drum **13** can be held.

Thus as the tension on the springs **22** increases due to the pull on the wire tensioning drum **13**, the bracket **29** on the slidable frame **11** moves with the frame and operates the master cylinder **20** as the tension of the springs **28** is countered. As the braking effect is lessened a balance is reached which can be pre-set at which irrespective of the rate of forward movement of the vehicle or the stopping of the vehicle, the tension will be maintained on the wires by the brake **17** due to the relative motion between the frame **10** and the frame **11** under control of the springs **22**.

It is convenient to use ordinary disc brakes for the braking unit **17** which can be hydraulically actuated by means of a control valve master cylinder **20** so that when the springs **28** are fully tensioned the drum has the maximum braking force applied to it, but as the vehicle commences to move forward when a wire has its end fixed to a post or the like and passes around the wire engaging members **14**, the pull so generated will release the brake **17** by an amount depending on the setting of the springs **22** and **28** until a balance is achieved where the drum will be allowed to rotate but will maintain the necessary tension on the wires irrespective of rate of forward movement.

The wire engaging members **14** are preferably curved at their outer extremities **30** as shown more particularly in FIG. **5** so that an improved holding of the wire can be effected by controlling the riding up effect of the wire on these arms which as previously stated have their inner ends staggered for better wire control.

The drum from which the wire is supplied can be mounted on the frame member **31** or can be positioned on any part of the vehicle and if desired guide members can be used to lead the wire to the tensioning drum **13** and to ensure that it passes around the drum for a sufficient portion of its periphery to obtain the necessary tensioning grip.

It will be realized of course that where a number of wires are fixed to posts and are being fed out at the same time, these wires can pass around a common drum **13** and be commonly fed with the required tension, and after leaving the tensioning drum **13** these wires could be guided on any suitable means if required to position them in relation to the posts, but it will also be realized that a series of these wire tensioning drums **13**, with the necessary braking means, could be positioned on the vehicle so that a number of these wires could be fed out at the same time each with its own tensioning means and positioned perhaps one above another in such a way that the wires assume their normal fencing alignment as they are fed from the wire tensioning drums **13**.

Such a device can of course feed barbed wire as well as plain wire and in many types of fencing a single barbed wire can be fed from a wire tensioning drum **13** and secured at the top of the fence, and the lowerportion lower portion the fence can be formed by wire fabric in which case the device of FIG. **6** can be used in which again there is a fixed frame **35** and a sliding frame **36**, the sliding frame **36** being guided by guide rollers **37**, one end of the frame carrying a frame member **39** having a lower member **41** and an upper member **42** so arranged that between them they can support a drum **43** having at its lower end a brake **44**, the upper member **42** being connected to the member **39** by a pivot **46** in such a manner that it can be swung upwardly out of the way so that the member **47** can engage the top of the drum **43** when it is supporting a roll of fabric **48** but can be swung upwardly and out of the way to allow a roll of new fabric to be positioned as required.

A hand operated screw device **49** engages a swivel member **50** in a fork in the end of the upper member **42** and also a screwed socket **51** on the member **39** so that the screw member **49** allows the other end of the upper member **42** to be correctly positioned with respect to

the drum 43, that is by raising that end of the member 42 the drum engaging member 47 can disengage from the drum 43 and the drum can then itself be removed from a shaft 53 on which it can be mounted and which also carries the disc 54 of the brake 44. A new roll of wire fabric can be positioned on the drum 43 and the upper end of the drum then again confined in position by the member 47 by operating the screw member 49 to move down the member 47 which of course as is shown is attached to the free end of the upper member 42.

To maintain the required tension on the wire the springs 56 are used, which are secured at one end to the sliding frame 36 and at the other end to a member 39, the brake rod 60 having the springs 61 secured to the bracket 62 and members 63 on the sliding frame 36. This device being similar in operation to the mechanism earlier described with reference to FIGS. 4 and 5, in that braking on the drum will decrease as the required tension is applied to the wire fabric which is being applied to the fence.

To position the posts the tray 70 of the vehicle has on it a frame 71 which supports a sliding frame 72 which can be moved in the direction of the arrow 73 by means of the hydraulic ram 74.

The piston rod 75 of the hydraulic ram 74 is attached by means of a pin 76 to the sliding frame 72 which can again be guided by means of rollers 77 to ensure smooth inward and outward movement in the direction of the arrow, this arrangement allowing the post driver to be moved in and out in relation to a transverse position on the vehicle so that as the vehicle moves forwardly the post driver can be accurately positioned along the line of the fencing.

Supported on the outer end of the sliding frame 72 is a vertical frame 78 which in turn carries post guides 79 which are spaced apart to leave between them a gap 80 in which the post can be positioned, these post guides 79 being themselves adjustable if required so that they can be positioned at a required distance from the ground and the post guides also supporting a pressing head 82 which is connected to the piston rod of a ram 83 carried by the post guides 79 through the attachment bracket 84 so that this ram can move the pressing head 82 downwardly or upwardly under hydraulic control of the ram 83 to permit the pressing head 82 to be raised and a post positioned between the post guide 79 within the space 80 therebetween after which the pressing head 82 is forced down by the ram 83 through any suitable hydraulic control mechanism and the post is forced down into the ground the required extent. A hammer can replace the pressing ram or can be used with it.

The post guides 79 are moved by means of the ram 87 which has its lower end attached to a bracket 88 secured to the vertical frame 78 but has its piston 89 coupled by means of a bracket 90 to the head piece 84 previously referred to, so that by operation of the hydraulic ram 87 the post guides can be moved up and down carrying with them the pressing head 82, but after positioning of the post guides 79 the pressing head can be independently operated by the ram 83.

The auger 5 can be attached to the frame 78 and as it can be of any apparent type it is unnecessary to go into details herein.

From the foregoing it will be realized that a simple and effective device is provided which will carry the whole of the mechanism whereby the manipulation of the wires to maintain the correct tension, be they barbed wire, plain wire or wire fabric, can be effected automatically as the vehicle progresses forwardly, and by positioning the wire supplying and the tensioning means forwardly of the post driving means it will be realized that an operator can move the vehicle forwardly a required amount after fixing the wires to a strainer post and a post can then be driven into the ground and the wires which are held at the required tension immediately fixed to the posts, whereupon the vehicle is again driven forwardly until the next post position is reached and the post is driven in this position and the wires attached thereto and so on until a fence has been completed.

As it is a principle in modern fencing to position these main posts considerable distances apart and to support the wires by means of spreaders or the like between these posts, the tension with which it is erected is most important as if this tension will again immediately spring back into position without any damage.

Thus although in FIG. 2 a schematic arrangement is shown in which the posts are shown spaced closely together, this is only for the purpose of illustration and very substantial distances between posts can be achieved due to the tensioning if this is required but naturally it would be possible to have closely spaced posts if this were thought more desirable.

Also as stated the posts instead of simply being driven into position by means of a post driver or as illustrated in FIGS. 7 and 8, can be driven in by such a member after a hole has been bored by any normal type of post borer such as indicated at 5 in FIG. 1, and a post of slightly greater diameter can then be driven into this hole.

This then enables wooden posts to be used as well as metal posts and also allows posts to be driven where rock or the like has to be penetrated which could only be effected by a boring action as well as a subsequent driving action.

Thus a simple and effective type of fencing is envisaged which can be progressively arranged by a unit travelling forward along the line which the fence is to take, the wires being first attached to a strainer post or the like and being then fed outward under the required tension along the plane of the intended fence and the posts are driven into the ground and tied to the fence wires so that each post subsequently has the required stability in the line of the fence while lateral stability is achieved by the strutting post at required intervals, thus making it possible to erect a fence progressively from a unit which can carry all the necessary equipment for effecting the erection.

What I claim is:

1. A portable fencing device comprising transport means, wire carrying means on the transport and tensioning means on the transport to feed wires from the carrying means, and post driving means on the said transport rearwardly of the wire feed means whereby posts can be driven into the ground at the tensioned line of the said wires and fixed to a post while maintaining the tension, said tensioning means comprising a ten-

sion drum to engage the wire, brake means on the drum, a mount attached to a front portion of said transport for the said drum and movable in relation to the said transport, means to apply the brake to the drum when no tension exists on the wires, and means to release the brake in proportion to applied tension to maintain a predetermined tension on the wire when established by movement of the transport along the line of fencing; the tension determining means comprising said mount including a fixed frame on the transport, and a movable frame supported on the fixed frame carrying the said drum; brake operating means between the fixed frame and the movable frame, spring means to urge the movable frame into a determined position in relation to the fixed frame, and spring means to cause the brake to be applied when the movable frame is in the said determined position but to release the brake on movement of the movable frame against the applied spring tension.

2. A portable fencing device according to claim 1 characterized in that the tension determining means comprise a fixed frame on the transport, a movable frame supported on the fixed frame and carrying the said tensioning drum, spring means to urge the movable frame into a determined position in relation to the fixed frame, brake operating means supported on the fixed frame, and brake controlling springs between the movable frame and the brake operating means to urge the brake operating means to brake-engaging position when the movable frame is in the said determined position but to decrease tension on the brake controlling springs when the movable frame is moved by wire tension on the drum against the tension of the springs between the fixed and movable frames.

3. A portable fencing device according to claim 9 wherein the brake operating means are hydraulic.

4. A portable fencing device according to claim 1 characterized in that the post driving means comprise means to engage and drive the posts, and means to effect movement of the driving means laterally to the line of fencing to allow the driving means to be brought into fence alignment.

5. Improvements according to claim 1 where said wire feed means position the wires along the fence line in desired vertical relation and the tension on the wires retains them in position as the posts are driven into position.

6. An improved fencing device, comprising:

a transport;

a supply of fencing wire carried by the transport;

a wire tensioning drum carried by the transport and engaging the fencing wire to continuously maintain tension on the fencing wire as the wire is run out from the transport; and

tension determining means including a brake engaging the drum to regulate the amount of tension of the wire, the tension determining means further comprising a fixed frame on the transport, a movable frame supported on the fixed frame and carrying the said drum, brake operating means between the fixed frame and the movable frame, spring means to urge the movable frame into a determined position in relation to the fixed frame, and second spring means to cause the brake to be applied when the movable frame is in the said determined position but to release the brake on movement of the movable frame against the applied spring tension.

7. The improved fencing device according to claim 6 wherein the tensioning drum is provided with a plurality of wire engaging members projecting outwardly from the drum in an irregularly spaced relationship whereby the wire is wrapped around the drum and linked by the wire engaging members to provide the necessary grip on the wire to maintain the desired tension.

8. The improved fencing device according to claim 6 wherein the wire tensioning drum is adapted to contain a roll of wire fabric.

9. The improved fencing device according to claim 6 wherein the tensioning drum is carried by the movable frame which is slidable on the transport, the device further including said second spring means which are spring control means engaging the frame and the transport and operable to control the brake means.

* * * * *