

No. 816,034.

PATENTED MAR. 27, 1906.

W. N. PARRISH.  
WIRE FABRIC MAKING MACHINE.

APPLICATION FILED FEB. 16, 1905.

5 SHEETS—SHEET 1.

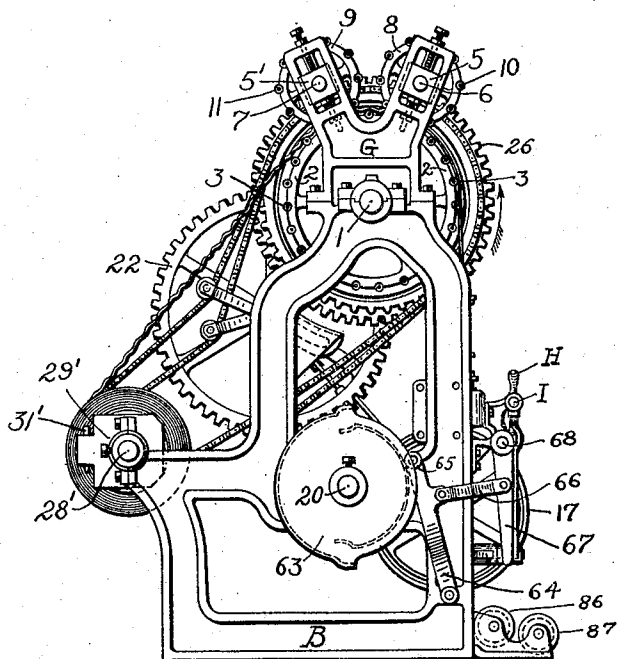


Fig. 1.

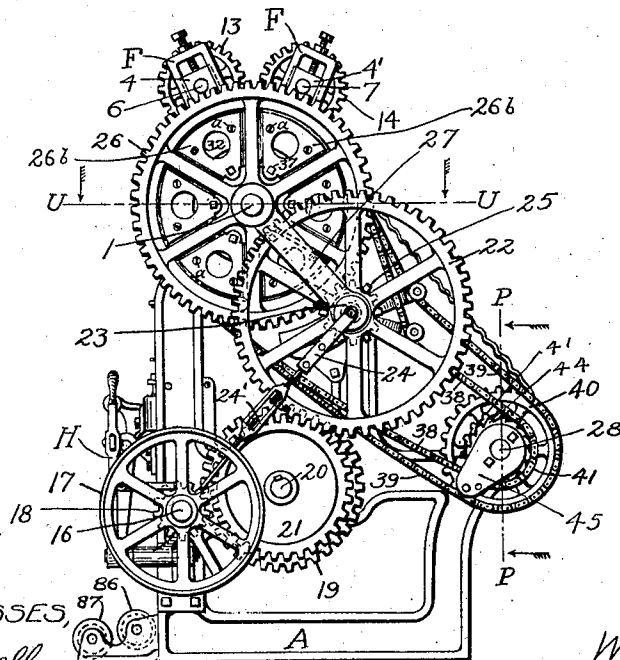


Fig. 2.

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J. G. Duvall.  
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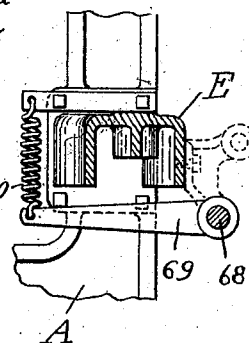
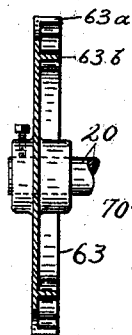
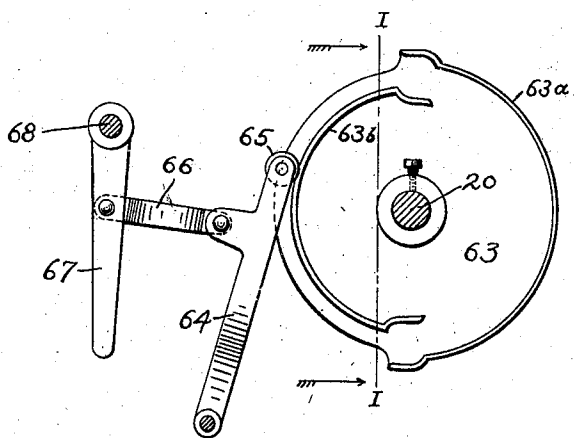
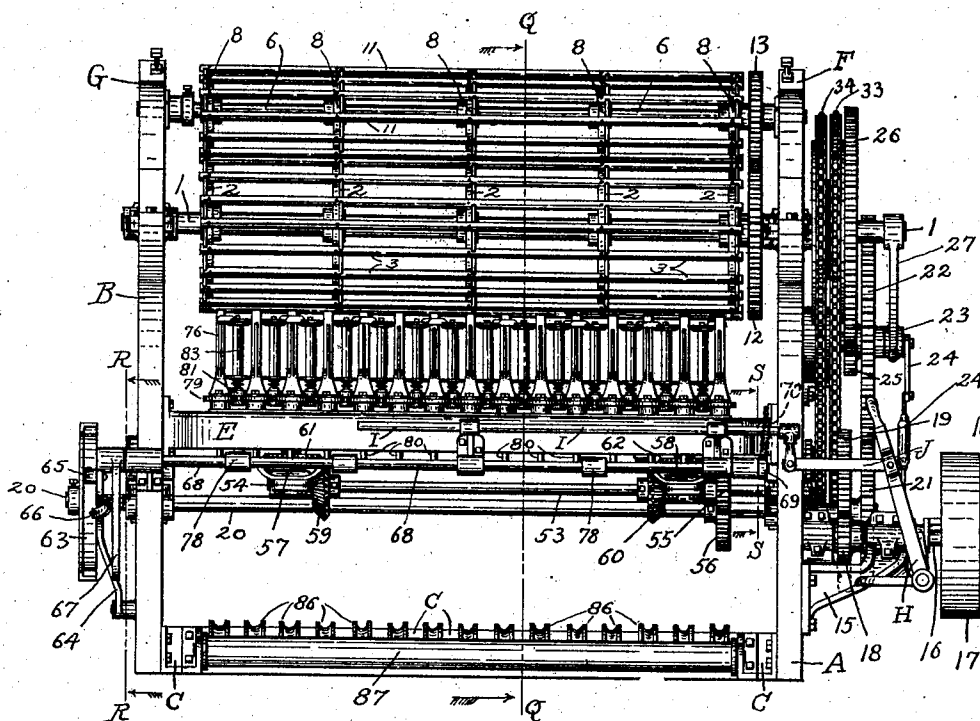
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5 SHEETS—SHEET 3.

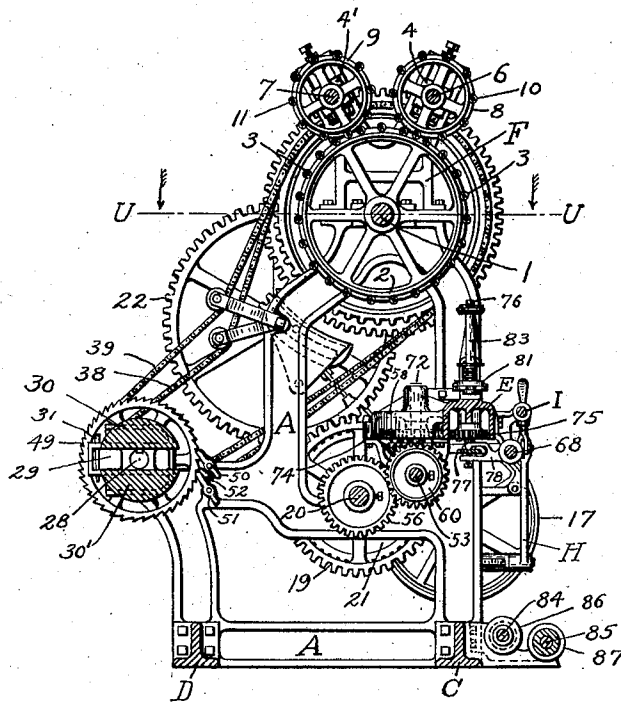


Fig. 7.

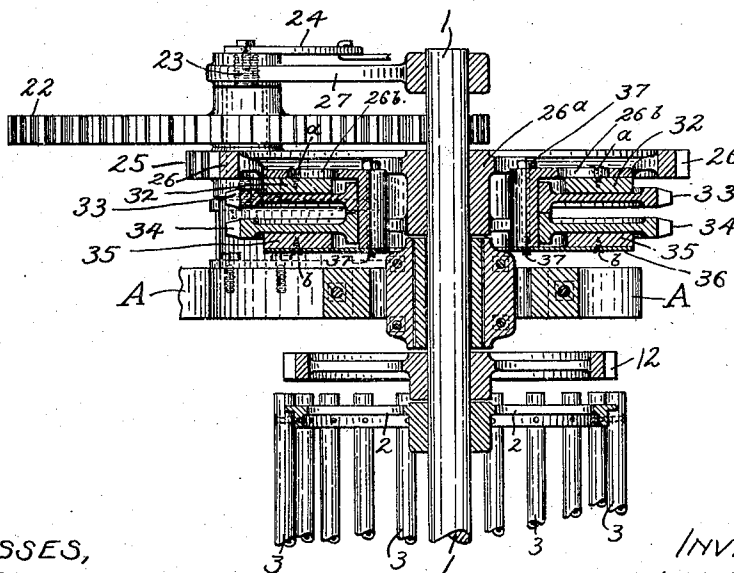


Fig. 8.

WITNESSES,  
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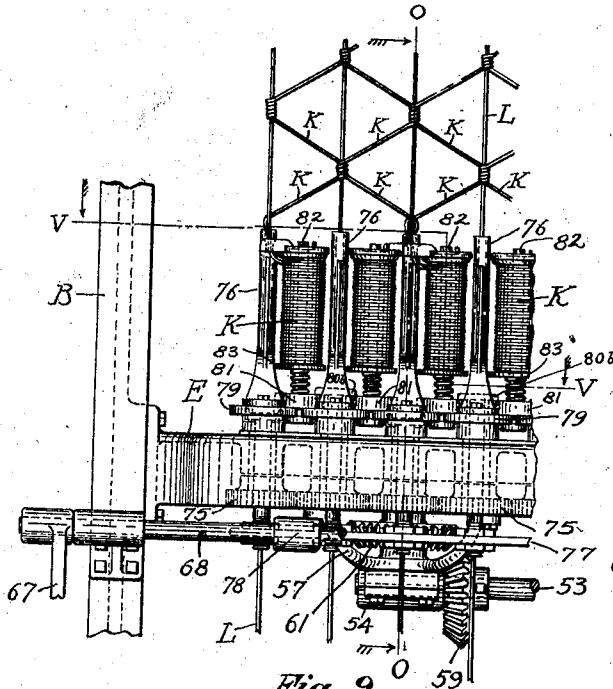


Fig. 9.

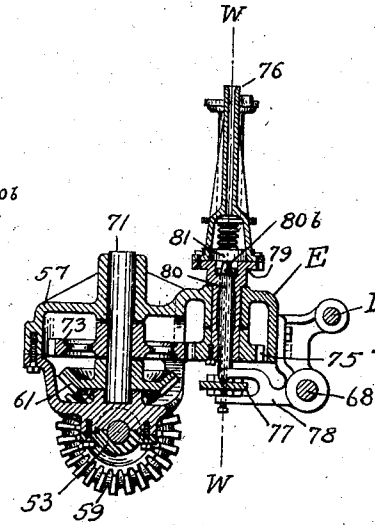
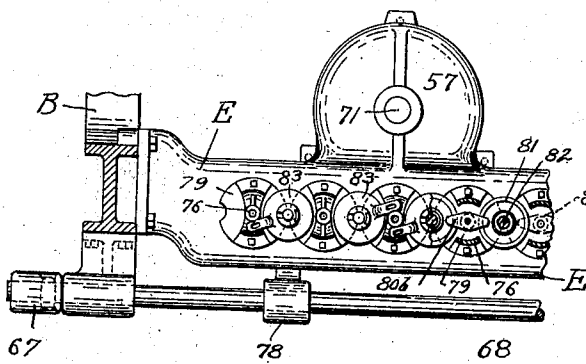


Fig. 10.



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5 SHEETS—SHEET 5.

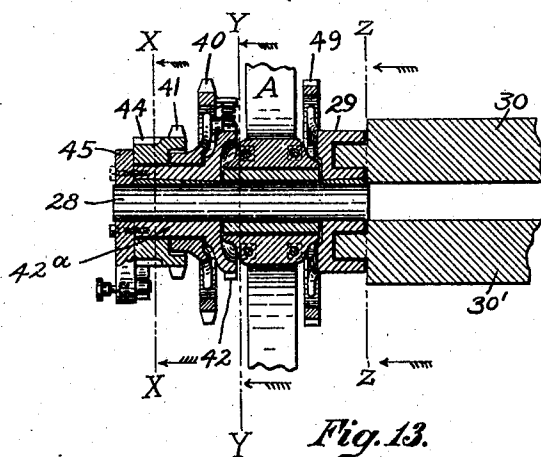


Fig. 13.

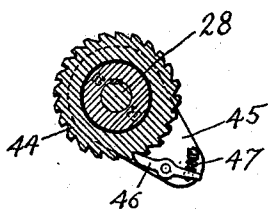


Fig. 14.

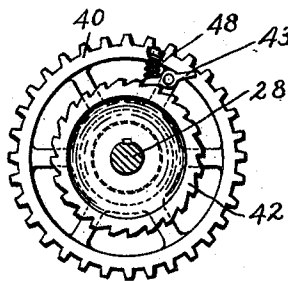


Fig. 15.

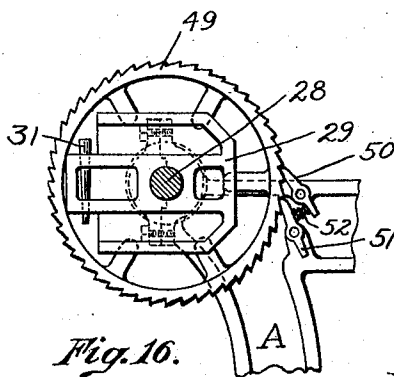


Fig. 16.

WITNESSES,  
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# UNITED STATES PATENT OFFICE.

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TO WILLIAM H. ALFORD, OF RICHMOND, INDIANA.

## WIRE-FABRIC-MAKING MACHINE.

No. 816,034.

Specification of Letters Patent.

Patented March 27, 1906.

Application filed February 16, 1905. Serial No. 245,902.

*To all whom it may concern.*

Be it known that I, WILLIAM N. PARRISH, a citizen of the United States, residing in the city of Richmond, in the county of Wayne and State of Indiana, have invented certain new and useful Improvements in a Machine for Producing Wire Fabric, of which the following is a full and clear description, such as will enable others skilled in the art to which the invention relates to make and use the same.

The machine forming the present invention is designed to produce a wire fabric technically known as "diamond mesh," said fabric consisting of a plurality of line-wires around which stay-wires are coiled, as will be hereinafter set forth.

The object of the invention is the provision of a machine of the character set forth having improved means for maintaining the tension of the fabric.

A further object of the invention is the provision of a machine of the character described so constructed that the weaving of the fabric is a continuous instead of a step-by-step operation.

A further object of the invention is the provision of an improved reel and method of mounting the said reel in the machine so that it may be readily removed therefrom when it is desired to remove a roll of the fabric and to start a new roll into the machine.

Further objects and advantages of the invention will be set forth in the detailed description which now follows.

In the accompanying drawings, Figure 1 is an end elevation of the left-hand end of my machine. Fig. 2 is an end elevation of the right-hand end of my machine. Fig. 3 is a front elevation of my entire machine. Fig. 4 is a detail view of the shifting-cam, taken on the line R R of Fig. 3. Fig. 5 is a detail sectional view of the shifting-cam, taken on the line I I of Fig. 4. Fig. 6 is a detail sectional view of a portion of the shifting-gear, taken on the line S S of Fig. 3. Fig. 7 is a vertical central cross-sectional view of the machine, taken on the line Q Q of Fig. 3. Fig. 8 is a detail section of the tension mechanism, being a horizontal section of a portion of the right-hand end of the machine, taken on the line U U of Figs. 2 and 7. Fig. 9 is a detail front elevation of a portion of the weaving mechanism. Fig. 10 is a detail ver-

tical section of a portion of the weaving mechanism, taken on line O O of Fig. 9. Fig. 11 is a detail plan, partly in section, of the spools and the bed-plate, taken on the line V V of Fig. 9. Fig. 12 is a detail vertical section of the spool mechanism, taken on the line W W of Fig. 10. Fig. 13 is a detail section of a portion of the reel for winding the finished product, taken on the line P P of Fig. 2. Fig. 14 is a detail of the reel mechanism, taken on line X X of Fig. 13. Fig. 15 is a detail of the reel mechanism, taken on the line Y Y of Fig. 13; and Fig. 16 is a detail of the reel mechanism, taken on line Z Z of Fig. 13.

Similar reference characters denote and refer to like parts throughout the several views of the five sheets of drawings.

The various operative mechanisms and parts which enter into the construction of this machine are mounted on a suitable framework, the right and left hand end members of which are denoted by the letters A and B, respectively, each being formed of an integral member.

The members A and B are spaced apart and are connected at the floor by the front and rear sills C and D, respectively, and they are further connected by the horizontally-disposed bed-plate, (denoted by the letter E.)

The end members A and B extend upward some distance, having removably secured on their upper ends and extending upward therefrom the Y-shaped members F and G, respectively. Boxings are provided in the juncture of the members A with F and of the members B with G, which are adapted to carry the bulldowser-shaft 1. Said bulldowser consists of a number of circular disks or wheels 2, secured to and disposed along the length of the shaft 1 between the members F and G, and secured in the peripheries of said wheels 2, extending parallel with the shaft 1, are a number of bars or tubes 3, which when permanently secured in the positions shown form the main bulldowser proper whereby the said bulldowser is made to simulate a drum. (Shown in Fig. 3.)

In the upper portions of the members F and G are mounted the adjustable journal-bearings 4 and 4' on the members F and 5 and 5' on the member G. In each pair of journal-bearings 4 5 and 4' 5' is mounted a shaft 6 and 7, respectively, on which shafts are secured the wheels 8 and 9, respectively,

similar to that of the bulldowser. Secured in the peripheries of the wheels 8 are the rods or bars 10, which extend parallel with the shaft 6, and secured in the peripheries of the wheels 9 are similar rods or bars 11 by the  
 5 above forming the two, front and rear, auxiliary bulldowsers, with the rods or bars thereof adapted to mesh in between the rods or bars of the main bulldowser, substantially as shown in Fig. 7.

Secured on the shaft 1 near the end of the bulldowser and being of same diameter as the wheels 2 of the bulldowser is a gear-wheel 12, meshing with the two gear-wheels  
 15 13 and 14, which latter are secured to the respective shafts 6 and 7 and are of same diameter as the wheels 8 and 9, respectively, of the auxiliary bulldowsers. By the above it will be seen that when the shaft 1 is revolved the bulldowser and the auxiliary bulldowsers will be revolved together and will mesh together, as aforesaid and as shown in the drawings.

Extending out from the side of the member A is a bracket 15, carrying the journal-boxings, in which is mounted the power-shaft 16, on the outer end of which shaft is secured the power-pulley 17, from which all the power is transmitted for operating the  
 30 machine.

Secured on the shaft 16 is the pinion 18, and meshing with the pinion 18 is the gear-wheel 19, which latter is mounted on the shaft 20, which shaft extends from end to end of the machine and beyond the members A and B at each end, and it is mounted in boxings therefor provided on the said members A and B. Also mounted on the shaft  
 35 20 near the gear 19 is the gear-wheel 21, which latter meshes with the larger gear-wheel 22. The gear-wheel 22 is mounted on an adjustable shaft 23, the inner end of which is adjustably connected to the member A, and the outer end is supported by the adjustable rod 24, having a turnbuckle 24' in its  
 40 length, and the said shaft 23 is further supported by the link 27, which connects the shafts 1 and 23, as shown. By this last-named arrangement it will be noticed that the gear-wheel 22 may be removed and one  
 45 corresponding thereto may be placed on the shaft 23, which will be of smaller diameter, and then by means of the adjustableness of the shaft 23 it may be caused to mesh with the gear 21. Also mounted on the shaft 23 is a pinion 25, and mounted on the outer extension of the shaft 1 is the gear-wheel 26,  
 50 which meshes with said pinion 25. Thus by the interposition of the train of gears just described the shaft 1 may revolve, carrying the bulldowsers.

Referring now to Fig. 8, it will be seen that said gear 26 is mounted on the shaft 1 by means of its integral hub 26<sup>a</sup>, which hub  
 65 tends inward and abuts against the bearing

for the shaft 1 in the member A, as shown. Carried by the arms of the gear 26 is an inwardly-facing web or plate 26<sup>b</sup> integral therewith. Secured to the inner face of the plate 26<sup>b</sup> by screws *a* is the wooden disk 32, and of  
 70 larger diameter than the disk 32, and contacting with the inner face thereof is the sprocket-rim 33. Of the same dimension as the sprocket-rim 33 and located adjacent thereto is the sprocket-rim 34. The numeral 35 denotes a wooden disk, similar to the disk 32,  
 75 secured by screws *b* to the metal disk 36, whereby it will contact with the web of the sprocket-rim 34, as shown. By the employment of the above-described mechanism it is  
 80 apparent that by tightening the tap-bolts 37 the wooden disks 32 and 35 will be caused to contact more or less with the faces of the web of their respective sprocket-rims 33 and 34 to control the speed of revolutions  
 85 of the finished fence. Mounted over and in engagement with the sprocket-rim 33 is the sprocket-chain 38, and mounted over the sprocket-rim 34 is the sprocket-chain 39, which sprocket-chains connect with the afore-  
 90 said reel mechanism, as shown. In the rearward projections of the members A and B are journaled bearings for the reel-pivots 28 and 28', said pivots being integral with the respective gudgeons 29 and 29', which gudgeons  
 95 have each formed therein a pair of open slots to receive slidably therein the ends of the two half-rounded bars 30 and 30', which extend across between the said gudgeons and are temporarily securable therein by the pins  
 100 31 and 31'. Adjoining the bearing of the pivot 28 and secured on the outer projection of the said pivot is the ratchet 42, having a collar-spindle 42<sup>a</sup> integral therewith, which collar-spindle extends out nearly even with  
 105 the end of the shaft 28. Mounted on said collar-spindle is the sprocket-wheel 40, over which operates the sprocket-chain 39, and also mounted on said collar-spindle adjacent the sprocket-wheel 40 and with its hub extending out even with the collar-spindle is the smaller sprocket-wheel 41, over which operates the sprocket-chain 38. On the inner  
 110 side of the sprocket-wheel 40 is a pivoted pawl 43, held in engagement with the ratchet 42 by the spring 48, whereby the reel is revolved by the operation of the sprocket-chain 39. Around the outer portion of the hub of the sprocket-wheel 41 is a ratchet 44, and secured over the outer end of the collar-spindle 42<sup>a</sup> is a plate 45, secured by the tap-bolts,  
 115 as shown, which plate carries a pawl 46, which pawl is held in engagement with the ratchet 44 by the helical spring 47. The numeral 49 denotes a ratchet-wheel secured to the outer end of the gudgeon 29 and at all times revolving with the reel. Back action of the  
 120 reel is prevented by the two pawls 50 and 51, pivoted to the inner face of the member A and held in engagement with the ratchet by

the spring 52, which spring is common to both pawls.

By the above it will be seen that the finished fence will be firmly but flexibly advanced and crimped by the bulldozers and will be wound on the reel with a uniform tension, as the tension mechanism above described will at all times justify the tension of the product on the reel, thus producing a more uniform product and causing less labor in its production.

The numeral 53 denotes a shaft pivoted at one end in the member A and then extending almost across the length of the machine, with its other end pivoted in a boxing 54, which boxing is supported by and in the rear of the bed-plate E. Mounted on the shaft 53 near the member A is a pinion 55, which pinion meshes with the gear 56, which latter is secured on the main shaft 20. Carried suspendingly from the bed-plate E are the two housings 57 and 58 of similar construction. Secured on the shaft 53 near the respective housings 57 and 58 are the bevel-gears 59 and 60, and mounted in the housings just stated and meshing with the respective bevel-gears 59 and 60 are the horizontally-disposed bevel-gears 61 and 62.

Secured on the outer end of the shaft 20 is the cam 63, which controls the shifting mechanism and having the outer guide-flange 63<sup>a</sup> and the inner guide-flange 63<sup>b</sup>. The numeral 64 denotes a lever pivoted at its lower end to the member B, then extending upwardly and having a roller 65 pivoted on its upper end to alternately contact with the outer face of the flange 63<sup>b</sup> and the inner face of the flange 63<sup>a</sup>, whereby as the cam 63 revolves the upper end of the lever 64 will be thrown alternately forward and backward. Pivoted to the lever 64 is the link 66, the other end of said link being pivoted to the finger 67, which latter is secured to the rocking shaft 68, on the opposite end of which shaft 68 is the finger 69, which extends inward, being held resiliently upward by the helical spring 70, the upper end of the latter being attached to some stationary part—as, for instance, the member A. The said shaft 68 is mounted at the front edges of the members A and B of the machine at a point slightly lower than the bed-plate E, as shown. The gear-wheels 61 and 62 are secured to short vertical shafts, as 71 and 72, respectively, and also mounted on said shafts above the gear-wheels 61 and 62 are the gear-wheels 73 and 74, respectively.

Mounted in the downwardly-facing cavity of the bed-plate E is a line of small gears 75, all meshing together and also meshing with the two gear-wheels 73 and 74. Extending along under and below the bed-plate E is a flat bar 77, which is carried by the arms 78, which arms are secured to and extend inward from the shaft 68, whereby as the shaft 68 is

slightly rocked the said bar 77 will be moved up and down. A number of apertures are formed through the bar 77, one for each gear 75, which apertures are located opposite the center of the said gears 75.

Mounted on top of the bed-plate E are the disks 79, each having a spindle journaled in suitable apertures therefor in the bed-plate and extending down even with the lower end of the bed-plate, and on the lower ends of the said spindles of the disks 79 are secured the said gears 75 by means of screws or keys substantially in the positions shown. Mounted on top of each of the disks 79 is a hollow double-footed spindle 76, secured by screws. Secured in the aperture of the bar 77 is a tube 80, (corresponding in number to the number of the gears 75,) which tube extends up through the respective gears 75 and their corresponding disks 79, which terminate at their upper ends in the oppositely-disposed upper and lower pairs of pintles 80<sup>a</sup> below and 80<sup>b</sup> above, with a space therebetween to receive the flanges of the spool-carrying disks 81, the latter having a vertical stem 82 extending up therefrom, as shown. Removably mounted on the stems 82 are the wire-spools 83, carrying the auxiliary wires K. The line-wires L extend up through the tubes 80 and the spindles 76 to the bulldowser after they have been incorporated in the finished product, which product is illustrated in Fig. 9 of the drawings.

Secured to the face of the sill C are brackets carrying a pair of shafts 84 and 85, each having a number of channel-wheels (corresponding in number to the number of spindles in the machine) 86 and 87, respectively, mounted thereon over and under or looped around which the line-wires L are drawn from their source of supply.

The letter H denotes a hand-lever operating a clutch for throwing the machine into and out of gear with the continuously-revolving pulley 17, and the letter I denotes a rod extending partially across in front of the machine, carried in guides extending up from the bed-plate, one end of said rod being connected to the link J, which latter is pivoted to the lever H, whereby the machine may be placed in or out of gear by moving the rod I endwise, as will be readily understood from the drawings.

The operation of my machine will be fully understood from the foregoing description; but it might be briefly stated as follows: The line-wires are first placed in position to bring each over a channel-wheel 87, then under, and in some instances once around the channel-wheel 86, then up through a tube 80 and out through the upper end of a spindle 76, from which latter the wire is passed over the main bulldowser under the two auxiliary bulldozers to and around the reel-bars 30 30', where it is secured, it being understood that



the number of line-wires L may be varied in number, depending on the desired height of the fence. The spools 83 are filled with the auxiliary wires K, the upper end being  
 5 threaded through an eye in the flange of the spool, and the ends are then fastened to the line-wires at points above the spools.

When the machine is started, the operation thereof will be such as to revolve the bulldowser in the direction indicated in Fig. 1, by  
 10 which the line-wires or the finished product will be continuously advanced. As the wires L are drawn through the spindles the spools will be carried around the line-wires, said  
 15 spools rotating alternately in opposite directions in substantially the same manner as shown in Patent No. 686,757 to W. N. Parrish. This alternate rotation is brought about by the rocking of the bar 77. Since  
 20 the gear-wheels 75 mesh with each other, it follows that each gear-wheel will rotate in an opposite direction from the adjacent gear-wheels. As these gear-wheels are secured to the spindles of the disks 79, it follows that  
 25 each of said disks will rotate in an opposite direction from its immediate neighbors. As is best illustrated in Fig. 11, notches are formed in the edges of disks 79. When the bar 77 rocks to its upper limit of movement, the upturned ends of members 80<sup>a</sup> engage  
 30 with the chimes of the base of the spool-carrying disks to prevent said disks from moving out of the notches formed in the disks 79. The spool-carrying disks are therefore caused  
 35 to rotate bodily with the disks 79 until the bar 77 rocks to move the members 80<sup>a</sup> out of engagement with the spool-carrying disks and to bring the members 80<sup>b</sup> into engagement with said disks. Said disks will then  
 40 be locked by members 80<sup>b</sup> to an oppositely-revolving disk 79 and be carried bodily around thereby to wrap the wire carried thereon around alternate line-wires.

My machine is positive in its operation and  
 45 in the accomplishment of its objects and will produce a wire fence in which the auxiliary wires are firmly locked in position on the line-wires, and while the machine as a whole has been described with considerable minuteness and exactitude in order that its construction and operation will be fully understood it is not my intention thereby to confine the arrangement and operation of the various parts to that shown and described,  
 50 as the invention contemplates such changes in the details as will be required under varying conditions.

From the above description, taken in connection with the accompanying drawings, it  
 60 will be most clearly manifest that I have devised an improved wire-fence machine in which are incorporated the objects elsewhere referred to in this specification.

Having now fully shown and described my  
 65 improvements and the best means for the

construction of a machine of this character to me known at this time, what I claim, and desire to secure by Letters Patent of the United States, is—

1. A wire-fence machine containing means 70 for advancing the line-wires vertically upward, means for alternately winding the auxiliary wires diagonally across and around the line-wires, a bulldowser and a pair of auxiliary bulldowsers meshing therewith, a reel to receive the finished product, and a friction-tension for operating and controlling the reel automatically, all substantially as shown and described.

2. A wire-fence machine containing means 80 for advancing a plurality of line-wires vertically, a series of wire-holding spools for operating around the line-wires, means for automatically controlling the operation of the spools, means for advancing and crimping 85 the product, and means for winding the product in rolls at a justified tension, all substantially as shown and described.

3. A wire-fence machine containing means for weaving wire fence, in combination with 90 the means for advancing and crimping the completed product, and means for winding the completed product, and for justifying the tension of the fence as it is being wound, all substantially as shown and described for the 95 purposes set forth.

4. A wire-fence machine containing means for carrying a plurality of line-wires vertically through weaving means, means for operating the spools around the line-wires as the line-wires are advanced, bulldowsers for advancing and crimping the finished product, a reel for receiving the finished product, and means for advancing the reel automatically at a continuously-justified tension, all substantially 10 as shown and described.

5. A wire-fence machine carrying a series of vertically-disposed and upwardly-moving wires, a series of wire-containing spools for weaving cross-wires around and between the 11 line-wires, means for supplying the line-wires to the spools at a proper uniform tension, means for advancing the line-wires and the finished product, and means for winding the finished product in a roll at a uniform automatically-operating tension, all substantially 11 as shown and described.

6. A wire-fence machine comprising in its construction a framework having a horizontal bed-plate, a shaft extending longitudinally 12 through the machine parallel with the bed-plate, a cam carried by said shaft for operating the shifting mechanism, an auxiliary shaft parallel with the first-named shaft, means carried by the auxiliary shaft for operating the weaving-spools, a main bulldowser over which the fence is carried, a pair of auxiliary bulldowsers meshing with the main bulldowser to receive and crimp the fence therebetween, a reel to receive the fence from the 13

bulldozers, and the mechanism for automatically applying tension in the operation of the reel, all substantially as shown and described.

7. A wire-fence machine comprising in its construction a framework having a horizontal bed-plate, a shaft extending longitudinally through the machine parallel with the bed-plate, a cam carried on the outer end of said shaft for operating the shifting mechanism, a second shaft mounted in bearings suspended from housings carried by the bed-plate, which second shaft is geared to operate the weaving-spools, means for shifting the spools by the operation of said cam, a main bulldowser over which the fence is carried, a pair of auxiliary bulldozers meshing with the main bulldowser to receive and crimp the product, a reel to receive the fence from the bulldowser, means for automatically applying tension in the operation of the reel, said reel being made in two parts and removably mounted in bearings of the machine.

8. In a fence-machine comprising a framework to support the moving parts, a bed-plate connecting the end members of the framework, a train of gears mounted on the end of the machine for operating automatically the various devices, a shaft extending through the machine parallel with the bed-plate, a cam mounted on the far end of said shaft, a second shaft parallel with the first shaft, means for revolvably mounting the second shaft, means consisting of a pair of bevel-gears mounted on the second shaft for operating the weaving-spools, a main bulldowser over which the product is carried, a pair of auxiliary bulldozers meshing with the main bulldowser to advance and crimp the finished product, a reel to receive the fence from the bulldozers, means for automatically applying tension in the operation of the reel, means for removing the rolls of fence from the machine, and means for placing the machine in and out of gear, all substantially as shown and described.

9. A wire-fence machine comprising a frame having rigid end members, a bed-plate connecting said members, a series of twisting means mounted on the bed-plate, means for carrying a series of line-wires through the twisting means, a three-part bulldowser for advancing and crimping the product, means for automatically operating said twisting means and the bulldowser, means for winding the finished product at a predetermined tension, and means for carrying the wire through the twisters and for attaching the auxiliary wires to the line-wires, all substantially as shown and described.

10. A wire-fence machine carrying a series of line-wires vertically, a series of wire-containing spools, means for operating the spools around the line-wires whereby their wires are wound around the line-wires, means for shifting the direction of the operation of the spools

and for changing them from one to the other of the line-wires, means for advancing the line-wires continuously, means for advancing the finished product, and means for winding the product on a reel by a changing tension, all substantially as shown and described.

11. A wire-fence machine comprising a frame, a shaft mounted in said frame, a main bulldowser mounted on said shaft, a reel upon which the product of the machine is wound, and a friction-drive between the said reel and the bulldowser.

12. In a wire-fence machine, the combination with a weaving mechanism, crimping mechanism and a reel upon which the finished product of the machine is to be wound, of a friction-drive between the crimping mechanism and said reel.

13. In a wire-fence machine, the combination with a main bulldowser, of a pair of auxiliary bulldozers meshing with said main bulldowser and means for adjusting said auxiliary bulldozers toward or from said main bulldowser.

14. In a wire-fence machine, the combination with a frame, of a shaft mounted in said frame, a bulldowser carried by said shaft, a gear-wheel mounted upon said shaft, means for imparting movement to said gear-wheel, a reel, and a friction-drive between said reel and said gear-wheel.

15. In a wire-fence machine, the combination with a frame, of a shaft mounted in said frame, a bulldowser carried by said shaft, a gear-wheel mounted on said shaft, means for imparting movement to said gear-wheel, sprocket-wheels frictionally driven by the gear-wheels, a reel, and connections between said sprocket-wheels and said reel.

16. In a wire-fence machine, the combination with a weaving mechanism, a crimping mechanism and a reel, of a gear-wheel secured to the crimping mechanism, a main power-shaft, gearing driven by said main power-shaft, and floating gearing located between said gearing and the gear-wheel of the crimping mechanism.

17. A bulldowser for wire-fence machines, comprising a shaft, a plurality of notched disks located upon said shaft, and a plurality of longitudinally-disposed rods or bars which lie in the notches of the disks and are secured to said disks.

18. In a wire-fence machine, the combination with a frame, of a bulldowser mounted therein and a pair of auxiliary bulldozers mounted in sliding bearing-blocks and meshing with the main bulldowser.

19. In a wire-fence machine, the combination with a frame, of a bed-plate extending longitudinally of the machine, weaving mechanism mounted upon said bed-plate, a bulldowser located above said bed-plate, a pair of auxiliary bulldozers which mesh with said bulldowser, a reel for receiving the fin-

ished product of the machine, and a friction-drive between the bulldowser and said reel.

20. In a wire-fence machine, the combination with a bulldowser-shaft, of a gear-wheel  
5 mounted upon said shaft, a web carried by said gear-wheel, an outwardly-extending flange carried by said web, a reel, a pair of sprocket-wheels mounted upon said flange and having frictional engagement with the

web of the gear-wheel, and connections between the reel and said sprocket-wheels. 10

In testimony whereof I have hereunto signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM N. PARRISH.

Witnesses:

ROBT. W. RANDLE,  
R. E. RANDLE.