

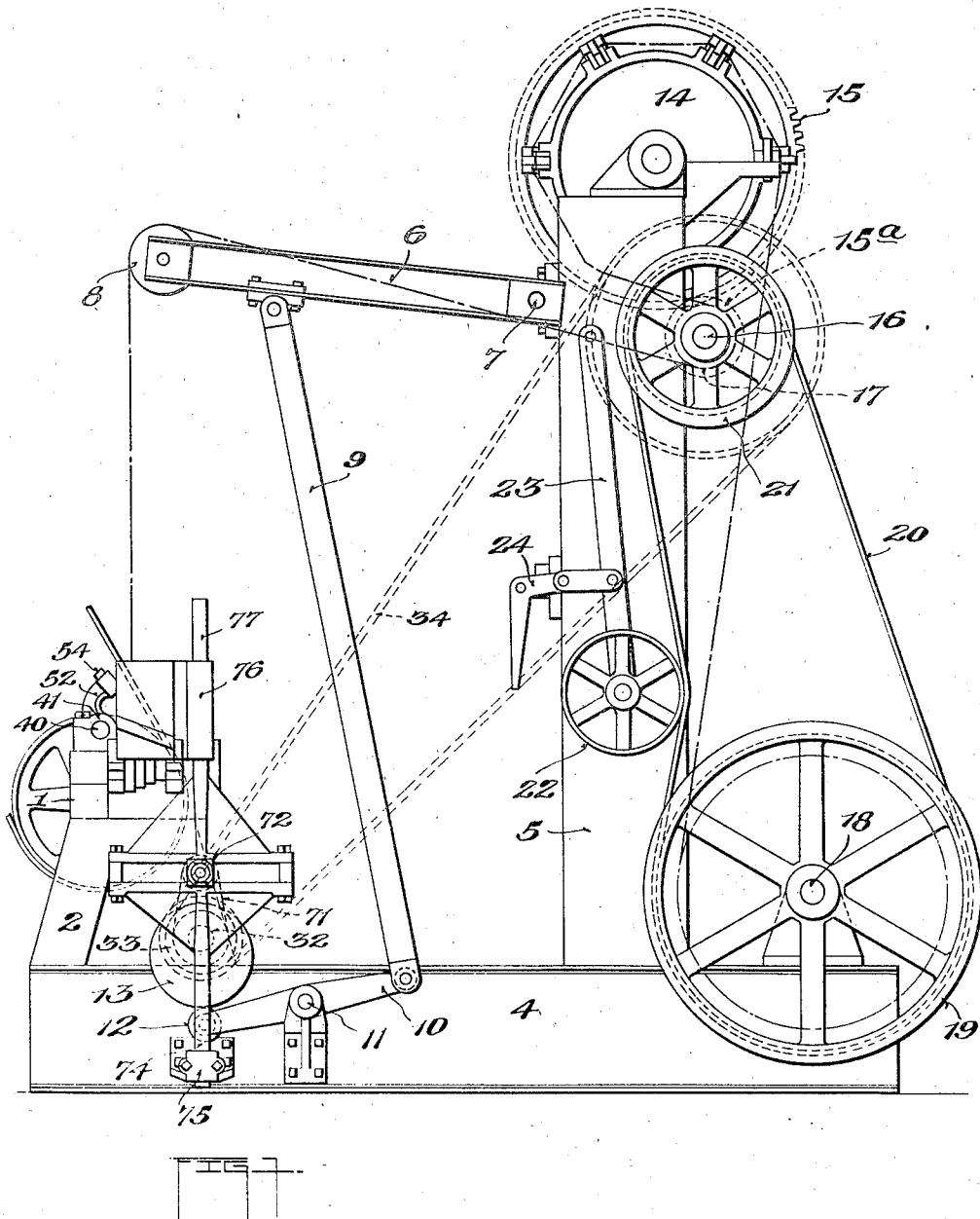
Dec. 28, 1926.

1,612,159

W. H. SOMMER

WIRE FENCE MACHINE

Original Filed March 24, 1922 8 Sheets-Sheet 1



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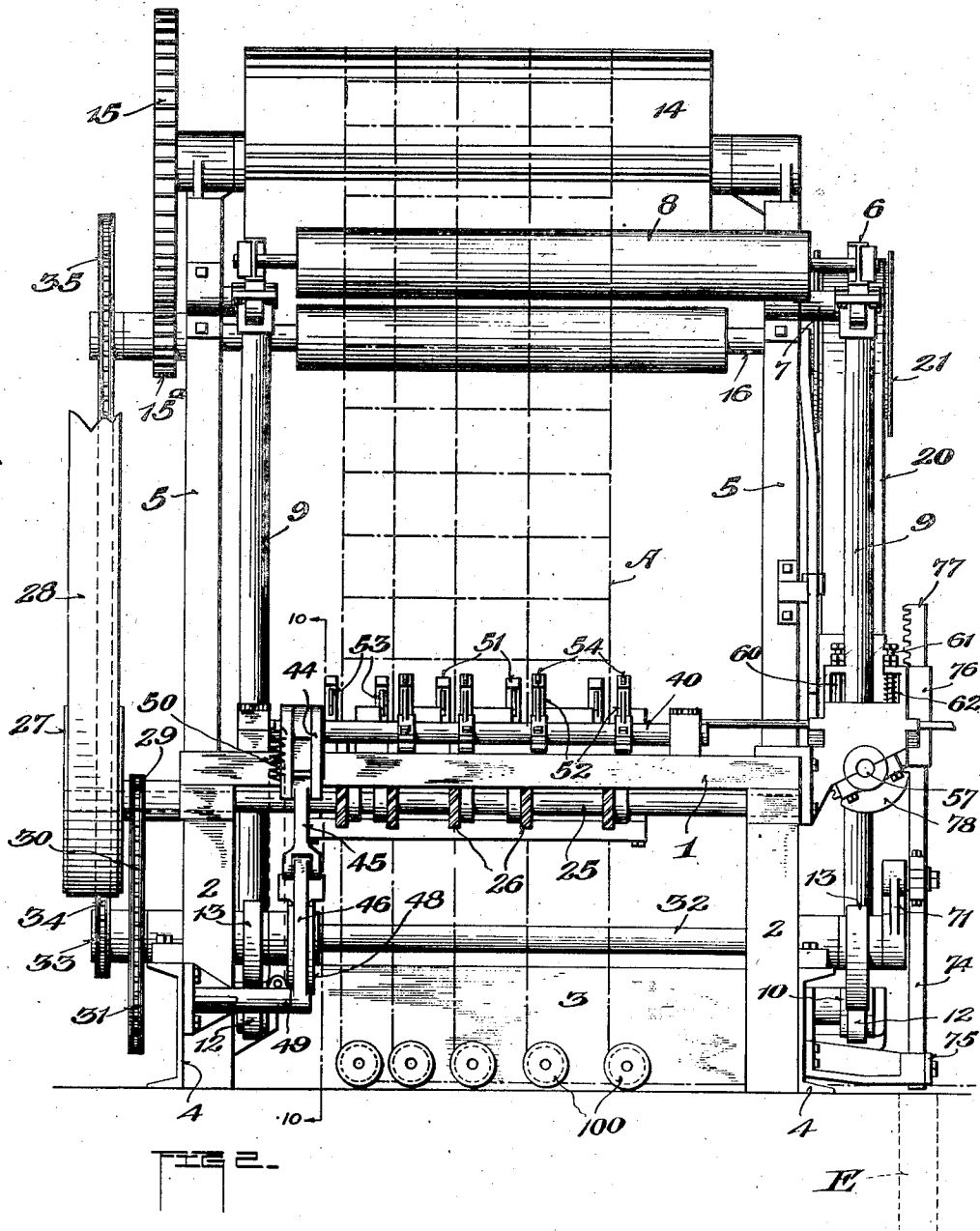
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W. H. SOMMER

WIRE FENCE MACHINE

Original Filed March 24, 1922 8 Sheets-Sheet 2



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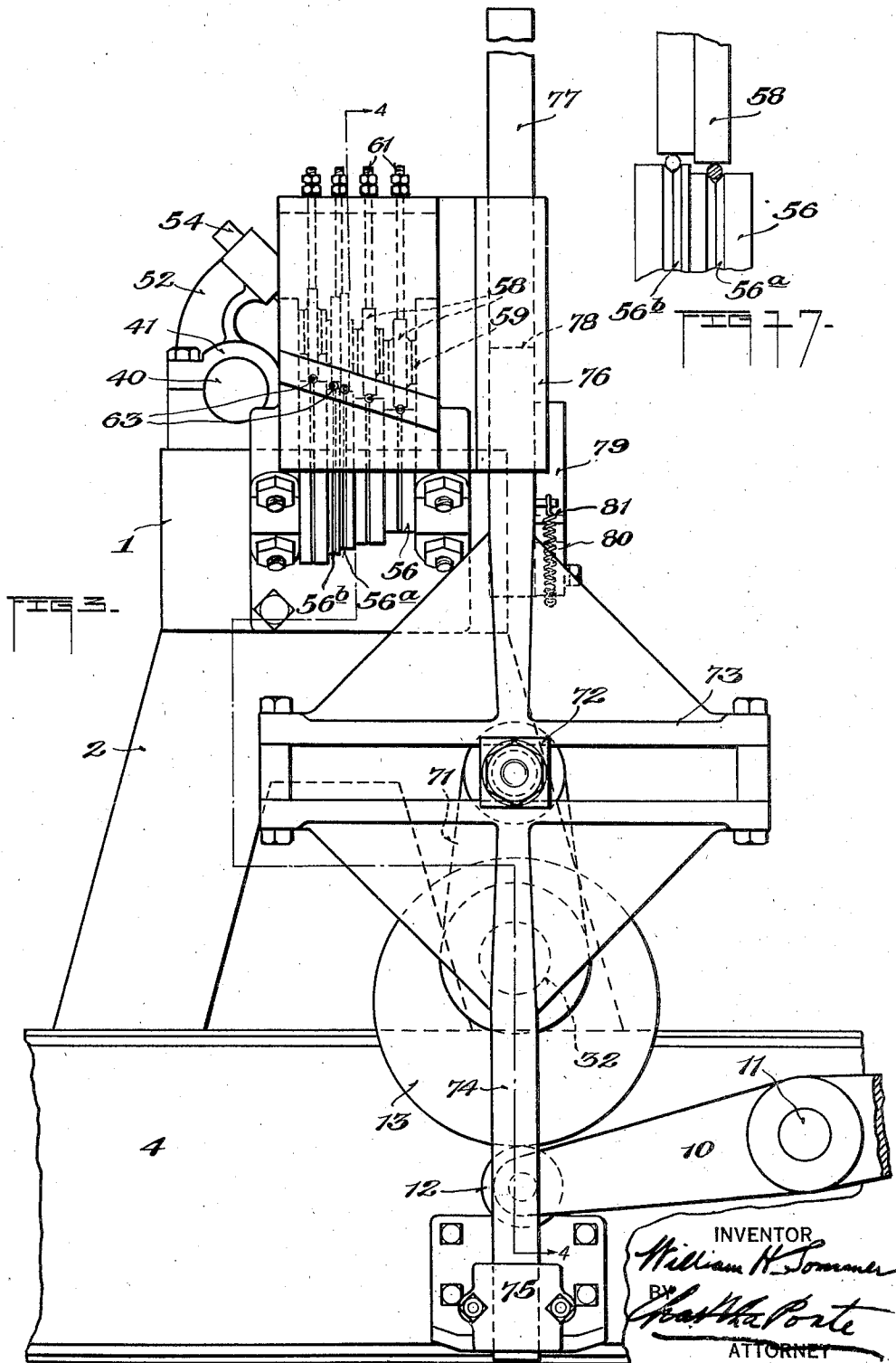
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W. H. SOMMER
WIRE FENCE MACHINE

Original Filed March 24, 1922

8 Sheets-Sheet 3



Dec. 28, 1926.

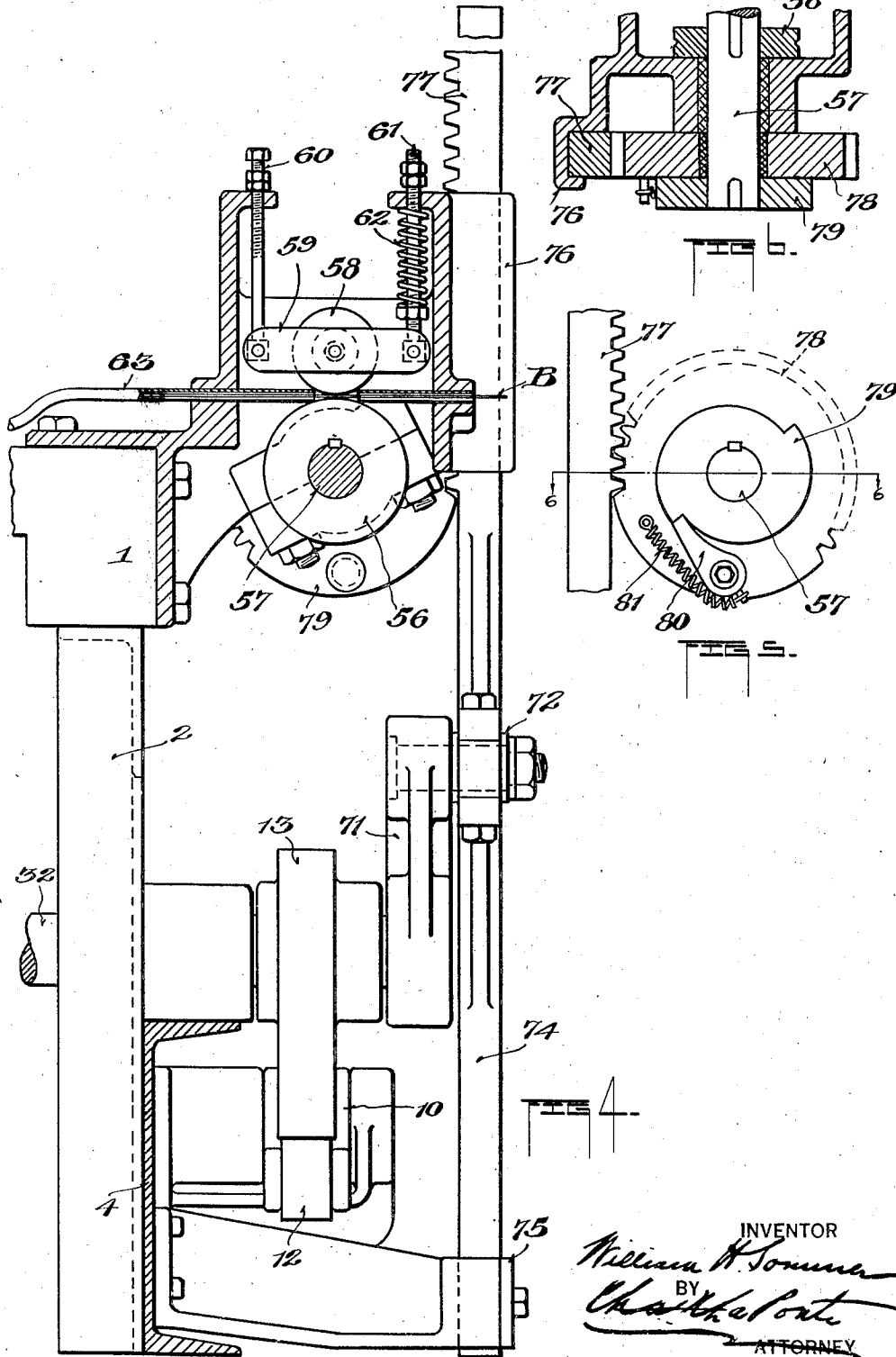
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W. H. SOMMER

WIRE FENCE MACHINE

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8 Sheets-Sheet 4



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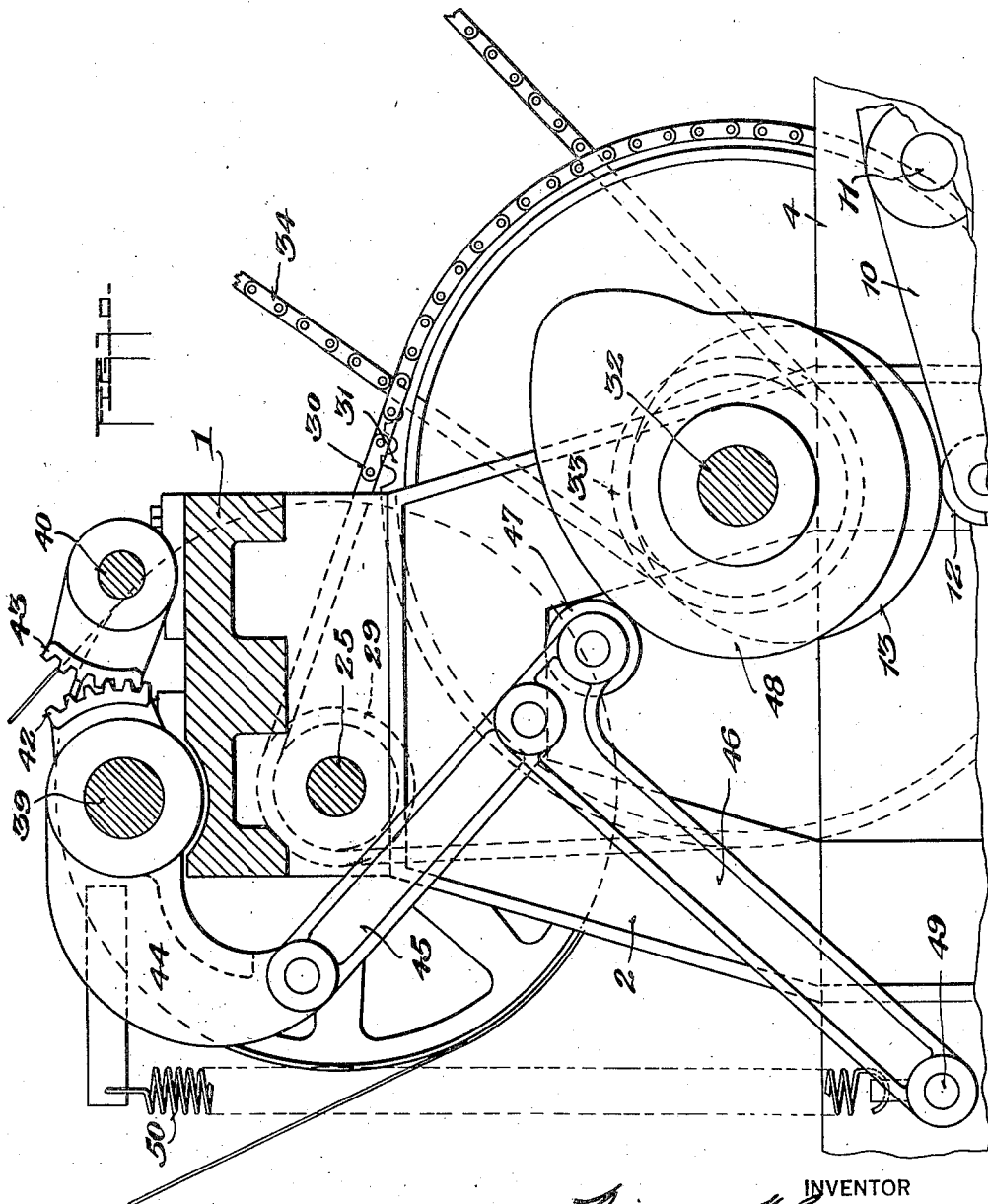
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W. H. SOMMER

WIRE FENCE MACHINE

Original Filed March 24, 1922 8 Sheets-Sheet 6



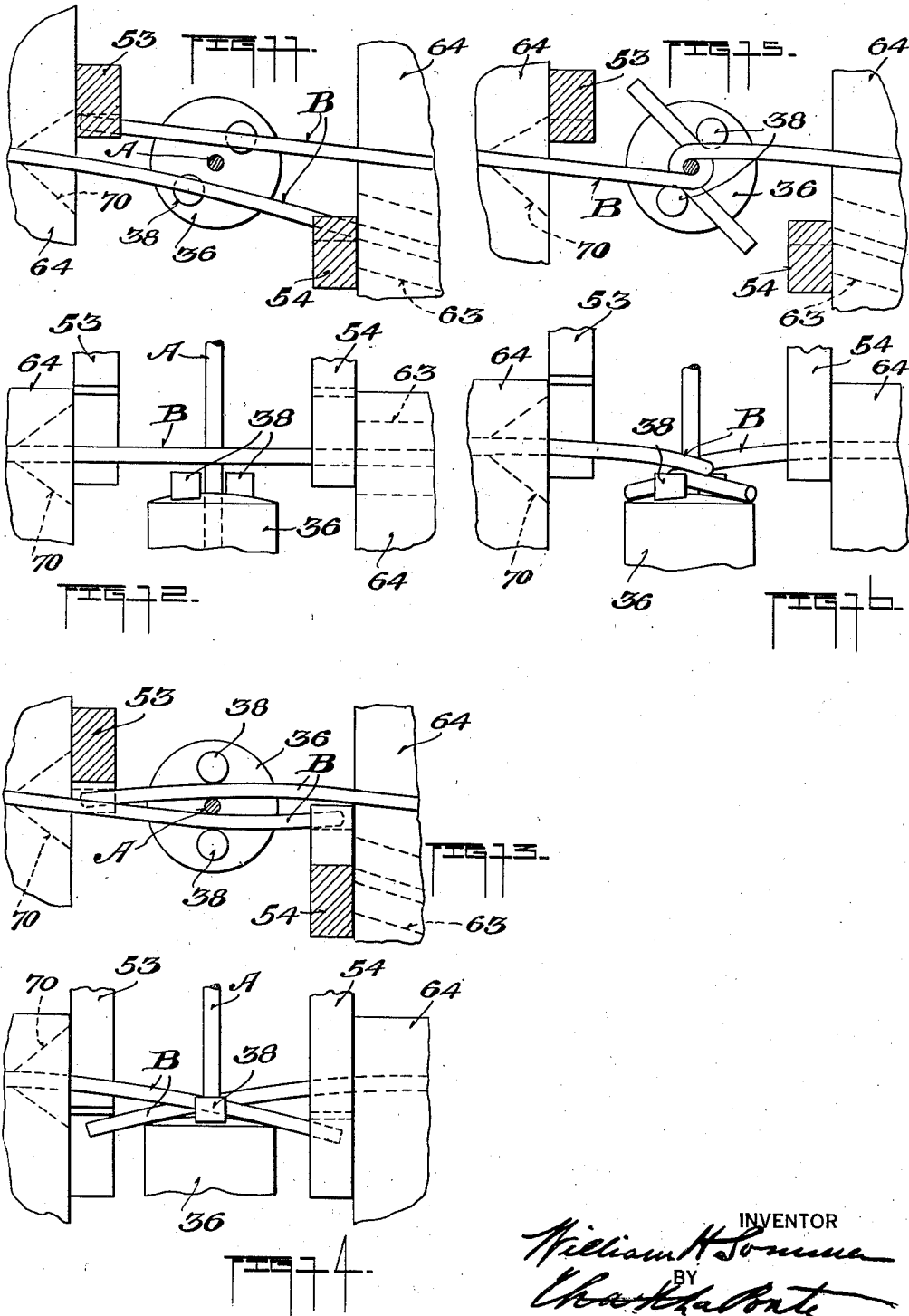
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1,612,159

W. H. SOMMER
WIRE FENCE MACHINE

Original Filed March 24, 1922 8 Sheets-Sheet 7



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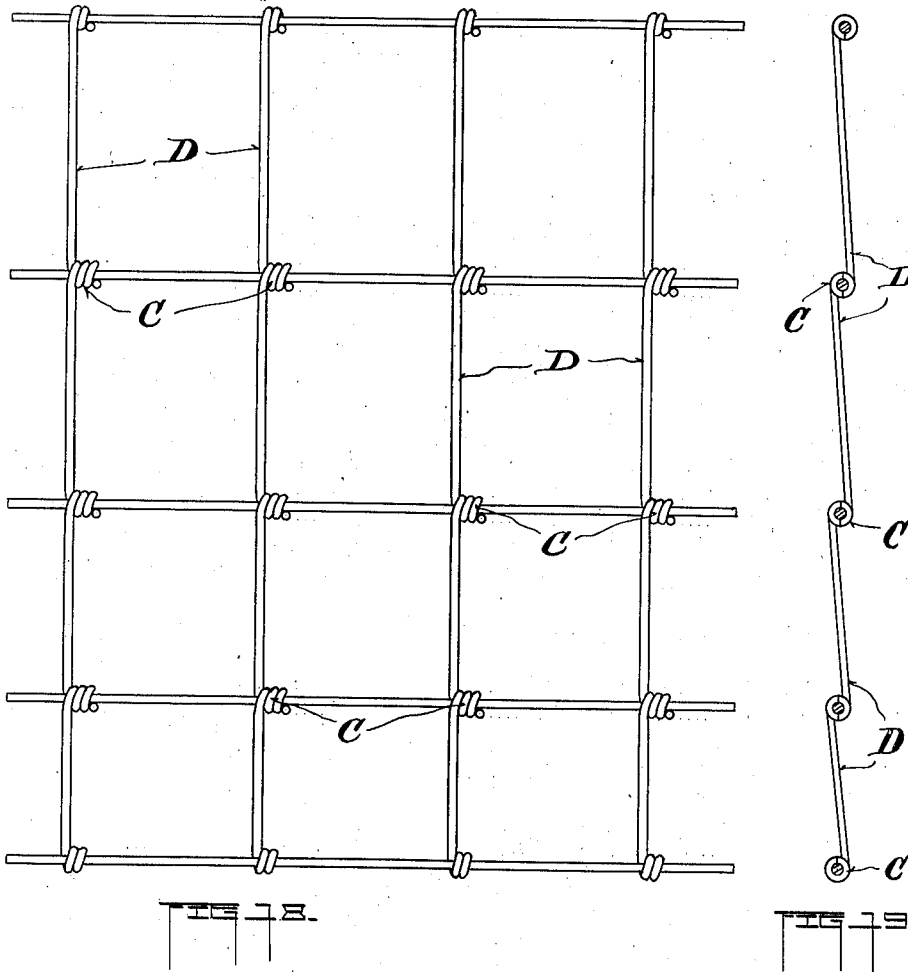
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WIRE FENCE MACHINE

Original Filed March 24, 1922

8 Sheets-Sheet 8



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UNITED STATES PATENT OFFICE.

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WIRE-FENCE MACHINE.

Application filed March 24, 1922, Serial No. 546,286. Renewed May 29, 1924.

This invention has reference to wire fence machines, and particularly to fence machines for making farm or poultry fences comprising longitudinal line or strand wires and vertical stay or picket wires, the latter preferably including short sections of stays severed from stay-feed-wires, their meeting ends intertwisted or intercoiled about the intermediate line wires, whereas the upper and lower ends of the top and bottom stay-sections are coiled or wrapped around the marginal or selvage line wires.

The invention has for one of its objects to provide sets or series of depressors for the stay sections to move the same into position to be coiled or wrapped by the coiling or wrapping spindles on the line wires, one set or series of depressors also acting as cutters for severing the stay-sections from the stay-feed-wires.

The invention has for a further object to provide an improved feeding means for the stay-feed-wires, whereby shorter or longer lengths of wires may be fed from which the top and bottom sections of stays are provided, as the height of fence to be made is changed, it being understood that different heights of fence are made on the same machine and the top and bottom sections of stays require more wire for the wraps on the marginal or selvage wires, than is required on the intermediate line wires.

Other and various objects will more fully appear in the following description.

That the invention may be more fully understood, reference is had to the accompanying drawings, forming a part of the description, illustrating a preferred embodiment of the invention, in which:—

Fig. 1 is a side elevation of the machine, looking at the feeding-in-side for the stay-feed-wires;

Fig. 2 is a front elevation of the machine;

Fig. 3 is a detail side elevation of the feeding and actuating means for feeding the stay-feed-wires;

Fig. 4 is a vertical sectional view as the same would appear, if taken on the line 4—4 Fig. 3;

Fig. 5 is a detail side elevation of the means for rotating the feeding rollers for feeding the stay-feed-wires;

Fig. 6 is a cross-section as the same would appear, if taken on the line 6—6 Fig. 5;

Fig. 7 is a plan view of the bed of the ma-

chine, showing the arrangement of the coilers, depressors and cutters, stay-feed-wire feeding means and the guiding tubes for the stay-feed-wires.

Fig. 8 is a cross-section as the same would appear, if taken on the line 8—8 Fig. 7;

Fig. 9 is a detail in section, as the same would appear, if taken on the line 9—9 Fig. 7;

Fig. 10 is a detail side elevation, in section, showing the operating means for the depressors and cutters, and is as the same would appear, if taken on the line 10—10, Fig. 2;

Figs. 11 and 12; 13 and 14 and 15 and 16 show respectively in plan and in elevation the successive steps of feeding the stay sections and severing and coiling the ends thereof around the line wires;

Fig. 17 is a detail of the feeding rollers for the stay-feed-wires showing how long and short sections may be fed for the top and bottom stay sections;

Fig. 18 is an elevation of a section of a fence such as made on the machine, and

Fig. 19 is an edge view of Fig. 18.

Like characters of reference denote corresponding parts thruout the figures.

Referring to the drawings, what I term the bed of the machine is designated 1, supported on end standards 2 connected by a base frame 3 and to rearwardly extended frames 4, from which, at suitable points rise the uprights 5.

Before entering into a description of the parts or elements constituting the invention herein, reference will be made to parts or mechanisms common to machines of this character and which are essential in so far as they go to make up a complete machine.

The pull out and spacer for the line wires comprises the oscillatory bars or beams 6 pivotally connected at 7 to the uprights 5, and said bars or beams at their forward ends are connected by a roller 8 over which the completed fence or fabric is carried. To said bars or beams 6 are pivotally connected reciprocal reach-bars or rods 9 pivotally connected at their lower ends to lever arms 10 fulcrumed at 11 and carrying rollers 12 contacting with cams 13 actuated in a manner to be described.

At the head end of the uprights 5 is revolubly mounted a clamp 14 of any desired construction and said clamp has a

large gear wheel 15 meshing with a smaller gear wheel 15^a on a shaft 16 carrying a roller 17. The completed fence or fabric passing over the roller 8 also passes around the roller 17 and around the clamp 14 and down and around any suitable wrapper on a shaft 18 to which is connected a large pulley wheel 19 driven by a belt 20 from a pulley wheel 21 on the shaft 16. The belt 20 is held taut by an idler or tightener pulley 22 journaled on a pivoted arm 23 adapted to be moved into operative and inoperative positions by the toggle-lever 24. In the position of the pulley 22 the belt 20 is taut and the wrapper is being revolved to roll up the fence. By swinging the pulley 22 out and away from the belt 20 the latter is inoperative although moving allowing the attendant to revolve the pulley 19 by hand to manipulate the wrapper and remove a roll of finished fence or fabric when necessary.

The driving shaft designated 25 extends lengthwise under the bed 1 and has secured thereto a plurality of preferably spiral gear wheels 26, spaced at suitable distances from each other, corresponding to the distances of the line wires A from each other, said wires being closer to each other at the bottom of the fence and farther apart at the top of the fence, as is understood in the practical manufacture of fencing. This shaft, when the machine is in operation rotates continuously. On one end of said shaft is secured a pulley wheel 27 driven by a belt 28 deriving its power from any suitable source. Also on said shaft is carried a sprocket wheel 29 operating a sprocket chain 30 for driving a sprocket wheel 31 and a timing shaft 32 to which it is connected, and said timing shaft also carries another sprocket wheel 33 driving a sprocket chain 34 which actuates a sprocket wheel 35 connected to the shaft 16, previously referred to.

36 designates coiling or wrapping spindles journaled in an upright position in the bed 1, one for each line wire A. Only five such spindles are shown in the drawing, the two outside receiving the marginal or selvage wires and the three intermediates receiving the intermediate line wires. There may be as many such spindles as desired, as it is understood fences are made in varying heights and the spindles need only be multiplied to give whatever height fence is desired. Such spindles are also spaced apart whatever distances may be desired. In practice the spindles are closer together for the bottom wires of the fence than at the top of the fence and at graduated distances therebetween. Each spindle on its lower end has connected thereto a spiral gear wheel 37 meshing with a spiral gear wheel 26 on the driving shaft 25, so that when

the latter is in operation the spindles are being continuously rotated. On the upper end of each spindle 36 is provided wire engaging elements 38 located on either side of an opening extending longitudinally through the spindles for the passage of the line wires A. Such elements 38 may be rollers, pins or other devices suitable for wrapping the stay-sections around the line wires, when said stay-sections are depressed on to the spindles between the elements 38 and the line wire A, as shown in Figs. 11 to 16, both inclusive.

Extending longitudinally of the bed 1 are rock-shafts 39 and 40 which are journaled in bearings 41 secured to the top of the bed at opposite ends thereof. These rock-shafts may be termed depressor shafts, and the shaft 40 designated a depressor and cutter shaft, as it functions both as a depressor and as a cutter shaft. To one end of the said shafts 39 and 40 are secured intermeshing segment racks 42 and 43, the former having an arm 44 to which is pivotally connected a bar 45 also pivotally connected to a second bar 46 having a roller 47 riding on the periphery of a cam 48 carried on the timing shaft 32, and said bar 46 is pivotally connected at 49 to a part of the machine frame, see Fig. 10. To yieldingly hold the bar 46 with the roller 47 in contact with the cam 48 a spring 50 is shown connecting the arm 44 and said bar 46.

On the rock-shafts 39 and 40 are suitably carried bracket-arms 51 and 52, the former carrying depressor-bars 53 and the latter carrying combined depressor and cutter bars 54, each bar having a notched end 55 adapted to provide a seat for the stay-feed-wire B as the depressors are moved downwardly to engage and press the severed stay-sections on to the spindles 36. The stay-feed-wires B are fed into the machine by a plurality of sets of feed rollers; each set including a grooved roller 56 secured on an operating shaft 57 and a comparatively smaller and superimposed coacting roller 58. These last mentioned rollers are each journaled in supports 59 suspended by rods 60 and 61 adjustably connected to the machine frame, said supports 59 being preferably pivotally connected to the rods 60 while springs 62 on the rods 61 tend to yieldingly hold the supports 59 with the rollers 58 in coacting relation with the rollers 57 between which and the rollers 58 the stay-feed-wires are fed, see Fig. 4. The successive rollers 56 are each larger in diameter than the preceding roller, see Fig. 3, which, as will be understood is to provide for feeding variable lengths of stay-sections, which as previously stated are shorter at the lower end of the fence or fabric, see Figs. 7 and 18, than they are at the top of the fence.

In Figs. 3 and 17 I have shown one of the

grooved rollers 56 with two annular grooves 56^a and 56^b, the latter of greater diameter than the former. The explanation for this is as follows:—In machines provided with more than seven sets of feed rollers 56 and 58 provision is made for manufacturing different heights of fence, by cutting out certain of the sets of feed rollers. When changing the height of fence provision must be made to feed the extra length of stay sections for the top of the stays or pickets to be wrapped or coiled around the top selvage or marginal wire. The same provision could be made should it be found desirable to change the spacing between the line wires at the bottom of the fence. Therefore, all the rollers 56 above the seventh roller from the bottom of the fence are preferably double grooved rollers, as shown in Fig. 17. Communicating with and leading from each set of rollers 56 and 58 are wire guiding tubes 63, all of which at their delivery ends are supported in suitable elements 64 mounted on the bed 1, see Figs. 7, 8 and 9. These elements are located between the spindles 36, as shown, with one such element in front of the top spindle, see Fig. 7. Each element, with the exception of the first one from the feed rollers is provided with an off-set 65 and together with a cap-plate 66 provide a groove 67 thru which the stay-feed-wire B is fed, and said cap-plates secure in place the preferably ball-clamps 68 yieldingly held in acting position by springs 69. At the receiving ends of the elements 64 having the clamps 68 the grooves 67 are provided with funnel shaped openings 70, see Figs. 11 to 16 to guide the wires into the grooves 67 after they leave the tubes 63 and cross the space between the elements 64 and over the top of the spindles 36, see Figs. 11 to 16. As shown in Fig. 7 the front end of each stay-feed-wire B stops just short of an element 64 below the depressor 53 so that as the shafts 39 and 40 are rocked in their bearings the depressors 53 engage with the forward and free end of the feed-wire while the combined depressors and cutters 54 pass down across the front face of the elements 64 and both sever the stay-sections from the feed-wire and depress the severed ends of said sections onto the coiling spindles. The alternate depressors acting to depress the forward and rear ends respectively of adjacent stay sections between the line wires and the coiling members 38, see Figs. 11 to 16, which as the coilers are revolved inter-wrap or inter-coil the ends of adjacent stay sections, as at C on the line wires, with the exception of the ends of the top and bottom sections which are coiled or wrapped singly about the top and bottom selvage or marginal wires of the fence. The ball clamps 68 hold the stay-feed-wires in the grooves 67 during the coiling operations, but yield

to the upward movement of the fabric or fence when moved by the pull-out frame 6 which, as understood, advances the fabric the distance it is desired to place the stays, six, nine, twelve inches or other distances apart, depending on the spacing desired. The pull-out is actuated from the timing shaft 32, the cams 13 for actuating the levers 10 being carried thereon, see Figs. 1, 2 and 3.

The feed-rollers 56 are intermittently operated from the timing shaft 32, as follows:—To the timing shaft is connected a crank-arm 71, see Figs. 2, 3 and 4 and said crank-arm has pivotal connection with a block 72 slidable in a crosshead 73 forming a part of or connected to a reciprocally supported bar 74 guided at its lower end in a bracket 75 and at its upper end in a guide 76. The upper part of the bar 74 is formed or provided with a rack-bar 77 having a meshing relation with a gear wheel 78 loosely carried on the operating shaft 57. Secured to said shaft adjacent said gear wheel is a ratchet wheel 79, formed preferably with two teeth, see Fig. 5, and pivotally connected to the side of the gear wheel 78 and adapted to engage said teeth is a ratchet pawl 80 yieldingly held in contact with said ratchet wheel by a spring 81, in manner shown in Fig. 5. It will thus be observed that as the timing shaft 32 is rotated the bar 74 will be moved up and down. With each down stroke of said bar the gear wheel 78 is turned backwards moving the pawl 80 from the position shown in Fig. 5 into a position to engage the disengaged ratchet tooth of the wheel 79, then on the up stroke of said bar 74 and as the gear wheel 78 is turned forward, the pawl 80 will move the ratchet wheel 79 and impart a partial rotation to the shaft 57 and the feed wheels 56, which, coacting with the feed wheels 58 will feed the stay-feed-wires B the distance required to furnish or supply stock for the stay-sections D severad therefrom.

The stay-feed-wires B are fed from reels or other carriers, not shown, and the line wires likewise are fed from reels, or other carriers, not shown, to and around guiding rollers 100 located in the base of the machine and up and thru the spindles 36. With the present construction it is preferable to provide a pit E, see Fig. 2 for the bar 74 on its down stroke.

In the operation of the machine the driving shaft 25 is continuously rotated imparting a like movement to the coiling spindles 36 thru the spiral gearing described. To depress the stay-sections D onto the coilers between the coiling members 38 and the line wires A the depressors must be timed in their movement relative to the coiling spindles, likewise the feeding in of the stay-feed-wires B and the pull-out for the finished fence. These latter elements are all

controlled from the timing shaft 32 thru the mechanisms and in the manner described.

What I claim is:—

- 5 1. In a wire fence machine, in combination, a bed, a plurality of coilers rotatably mounted in said bed, stay-feed-wire feeding means, a pair of rock-shafts, a plurality of depressors on said shafts, the depressors on one shaft serving also as cutters, operating means between said shafts, a timing shaft, and means for imparting oscillatory movement from said timing shaft to one of said rock-shafts.
- 10 2. In a wire fence machine, in combination, a plurality of grooved feeding rollers of predeterminedly differing diameters for feeding simultaneously different lengths of stay wire, certain of said rollers having portions of reduced diameter grooved to feed shorter lengths of the same stay wire for varying the height of the fence, said reduced portions being designed for use alternately with the major-diametered portions of said rollers.
- 15 3. In a wire fence machine, in combination, a plurality of grooved feeding rollers, the successive rollers being of a larger diameter than the preceding roller, and certain of said rollers being provided with a pair of wire grooves one of greater diameter than the other, and means for intermittently actuating said rollers.
- 20 4. In a wire fence machine, coilers, means to operate the coilers, stay-wire feeding means, a pair of rock shafts, depressors carried by the rock shafts, intermeshing toothed segments carried by the respective rock shafts to effect actuation of same in unison, a toggle connection pivotally connected to one rock shaft, and means to actuate the toggle connection.
- 25 5. In a wire fence machine, coilers, means to operate the coilers, stay-wire feeding means, a pair of rock shafts, depressors carried by the rock shafts, intermeshing toothed segments carried by the respective rock shafts to effect actuation of same in unison, a toggle connection pivotally connected to one rock shaft, a cam for actuating the toggle connection, and means to tension the toggle connection so as to hold same engaged with the cam.
- 30 6. In a wire fence machine, wire feeding means including a wire engaging device, a shaft carrying the device, a ratchet wheel keyed on the shaft, a gear wheel loose on the shaft, a pawl carried by the gear wheel and engageable with the teeth of the ratchet wheel to rotate the latter upon movement of the pawl in one direction and to idly ride over the ratchet teeth when moved in the opposite direction, a rack bar in mesh with the teeth of the gear wheel, and means to reciprocate the rack bar including a timing shaft, a crank arm carried by the timing shaft, a slotted cross-head connected to the bar, and a slidable block in the slot of the cross-head connected to the crank arm.
- 35 7. In a wire fence machine, a frame, coilers, means to operate the coilers, stay-wire feed means, a rock shaft, depressors carried by the rock shaft, and means to actuate the rock shaft including an arm connected thereto, a bar pivoted to the arm, a second bar pivoted to the frame and to the second bar, a cam for operating the second bar, and spring means to tension the second bar to hold same engaged with the cam.
- 40 8. In a wire fence machine, a frame, coilers, means to operate the coilers, stay-wire feed means, a rock shaft having an arm, depressors carried by the rock shaft, a toggle connection pivoted to the arm, a cam for actuating the connection, and spring means for tensioning the connection to hold same engaged with the cam.
- 45 9. In a wire fence machine, a frame, coilers, means to operate the coilers, stay-wire feed means, a rock shaft having an arm, depressors carried by the rock shaft, a toggle connection pivoted to the arm, and means for actuating the connection.
- 50 10. In a wire fence machine, coilers, means to operate the coilers, stay-wire feeding means, a pair of rock shafts, depressors carried by the rock shafts, a radial arm connected to one of the shafts, a depending bar pivoted to the arm, a second bar pivotally connected at one end to the lower end of the depending bar, means to pivotally support the opposite end of the second bar, a roller on the second bar, a cam engaging the roller, spring means connecting the second bar and the arm, and means to actuate the other rock shaft from the first named one.
- 55 11. In a wire fence machine, coilers, means to operate the coilers, stay-wire feeding means, a pair of rock shafts, depressors carried by the rock shafts, a radial arm connected to one of the shafts, a depending bar pivoted to the arm, a second bar pivotally connected at one end to the lower end of the depending bar, means to pivotally support the opposite end of the second bar, means to actuate the second bar, means to actuate the other rock shaft, and means to tension the second bar.
- 60 12. In a wire fence machine, coilers, means for operating the coilers, unitary stay-wire feed means including a series of unitary rollers each having independent and closely related parts for feeding stays of varying lengths, said parts being arranged whereby either part thereof may operate independently of the other part whereby to fabricate a fence of varying heights and means to operate the feed means.
- 65 13. In a wire fence machine, coilers, means for operating the coilers, stay-wire feed

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means including a series of unitary feed rollers each having independent and closely related feeding grooves all of which rollers are movable in unison for feeding stays of varying lengths, said feeding grooves being arranged whereby either groove thereof may operate independently of the other groove whereby to fabricate a fence of varying heights, and means to operate the feed means.

14. In a wire fence machine, coilers, means to operate the coilers, stay-feed wire feeding means, a pair of rock shafts, depressors on the shafts, means actuated by one shaft to actuate the other in unison therewith, a timing shaft, and means actuated by the timing shaft to oscillate one of the rock shafts.

15. In a wire fence machine, a plurality of coilers, means for operating the coilers, stay-feed-wire feeding means, means for operating the feeding means, a pair of rock-shafts arranged on opposite sides of the line of feed of said feeding means, depressors on one rock shaft, and combined depressors and cutters on the other rock shaft arranged in alternate relation to the first mentioned depressors, each of the combined cutters and depressors coacting with a depressor for the same stay length.

16. In a wire fence machine, a plurality of coilers, means for operating the coilers, stay-feed-wire feeding means, means for operating the feeding means, a pair of rock-shafts arranged on opposite sides of the line of feed of said feeding means, depressors on one rock shaft, and combined depressors and cutters on the other rock shaft.

17. In a wire fence machine in combination, a plurality of coilers, means for imparting continuous rotation to said coilers, stay-feed-wire, feeding means, means for intermittently actuating said feeding means, guiding tubes for said wires, a pair of parallel spaced rock-shafts, and a plurality of depressors connected with each shaft, the depressors on one of said shafts acting in front of the delivery end of each tube, and cooperating with said delivery ends to form cutters.

18. In a wire fence machine, in combination, a bed, a plurality of coilers journaled in said bed, means for continuously actuating said coilers, stay-feed-wire feeding means, means for intermittently actuating said feeding means, a guide between each coiler and one in front of the first coiler, means yieldingly holding the wires in said guides, wire guiding tubes between the feeding means and said guides, a pair of parallel spaced rock-shafts, a plurality of depressors connected with each shaft, certain of said depressors coacting with said guiding tubes as cutters.

19. In a wire fence machine, in combination, a bed, a plurality of coilers rotatably mounted in said bed, stay-feed-wire feeding means, a pair of rock-shafts, a plurality of depressors on said shafts, the depressors on one shaft serving also as cutters, operating means between said shafts, a timing shaft, and means for imparting oscillatory movement from said timing shaft to one of said rock-shafts.

20. In a wire fence machine, coilers, means to operate the coilers, stay-wire feeding means for feeding the wire above and substantially parallel to the plane of the bed of the machine, two series of downwardly moving depressors, means to operate the depressors, and guiding means for the stay-wire arranged adjacent to the respective depressors, of one of the series of the latter, whereby to cooperate with the same to form cutters.

21. In a wire fence machine, coilers, means to operate the coilers, stay-wire feeding, two series of downwardly moving depressors, means to operate the depressors, and guiding means for the stay-wire arranged adjacent to the respective depressors of one of the series of the latter, whereby to cooperate with the same to form cutters, the depressors of one series being arranged in alternate order with respect to the depressors of the other series.

In witness whereof, I have hereunto affixed my hand this 18th day of March, 1922.

WILLIAM H. SOMMER.