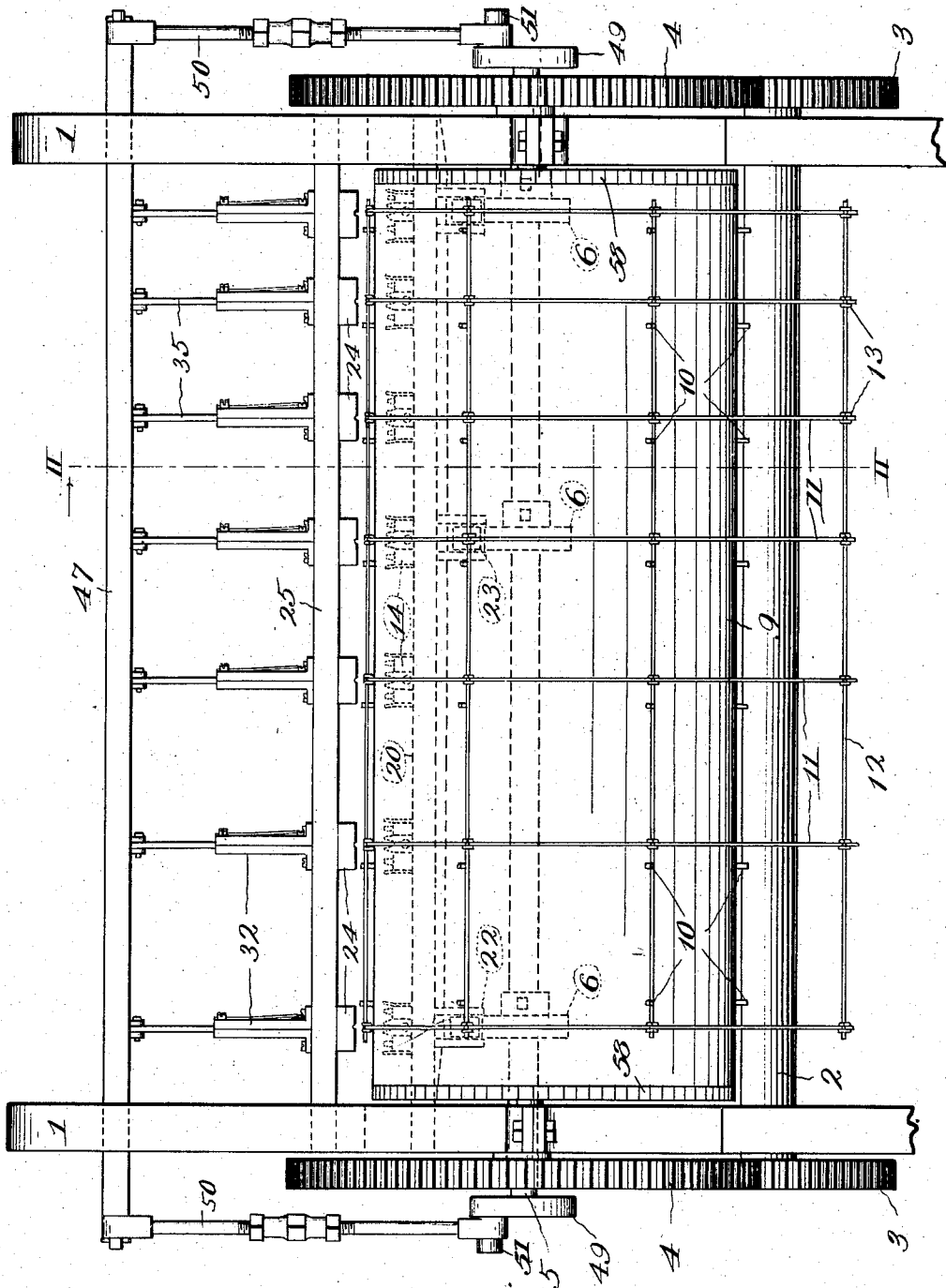


1,027,454.

F. E. WILLITS.
WIRE FABRIC MACHINE.
APPLICATION FILED JUNE 5, 1909.

Patented May 28, 1912.

4 SHEETS—SHEET 1.



Witnesses:
R. E. Hamilton
M. Cox

Fig. 1.

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4 SHEETS-SHEET 2.

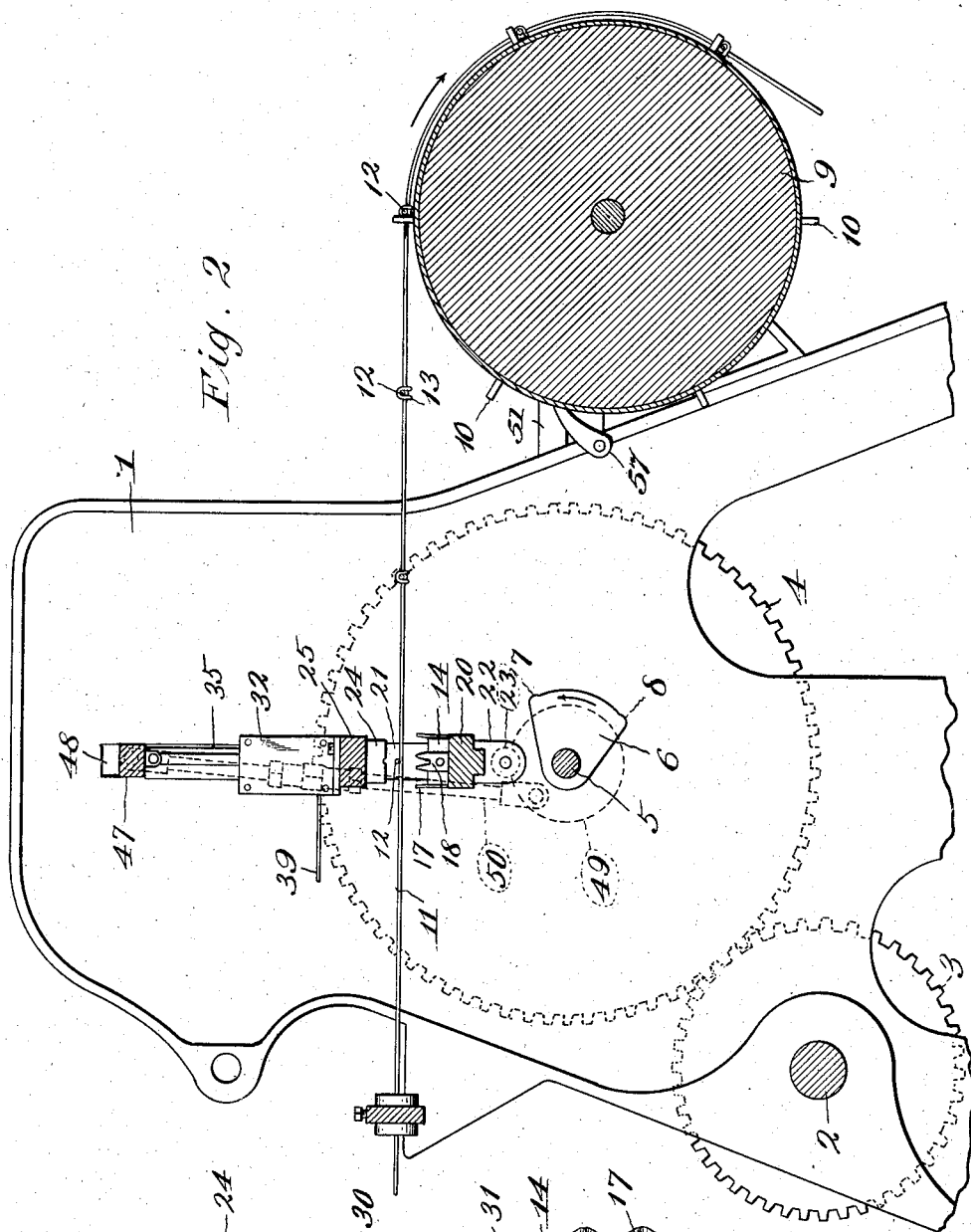


Fig. 2

Fig. 3

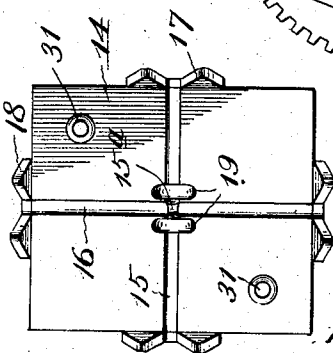
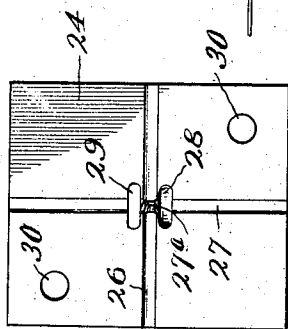


Fig. 4

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4 SHEETS—SHEET 3.

Fig. 5.

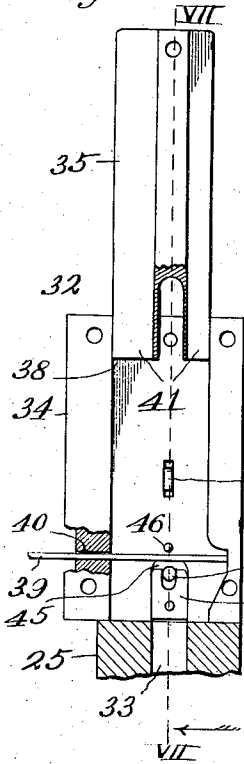


Fig. 7.

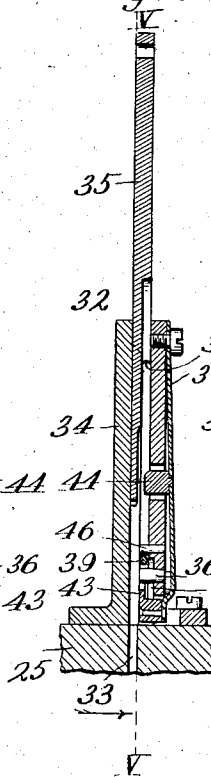


Fig. 8.

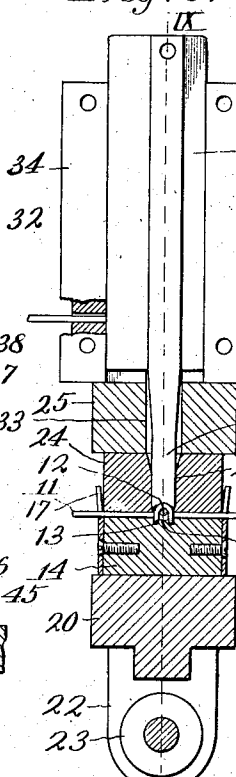


Fig. 9.

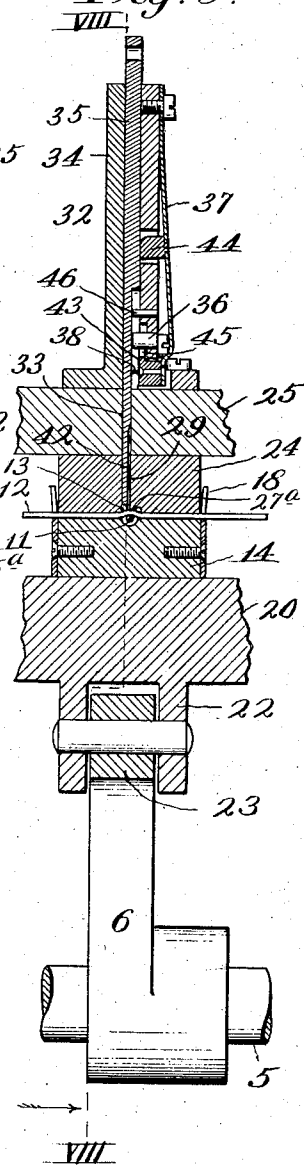


Fig. 6.

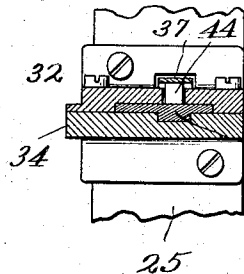
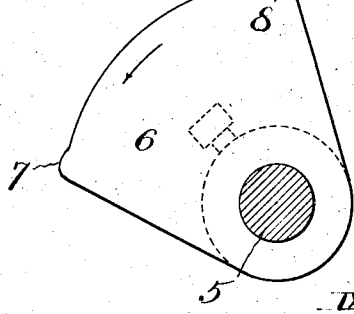
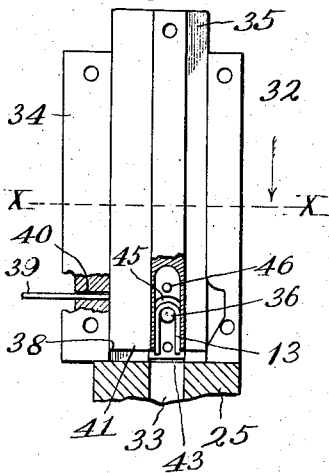


Fig. 10.

Witnesses:

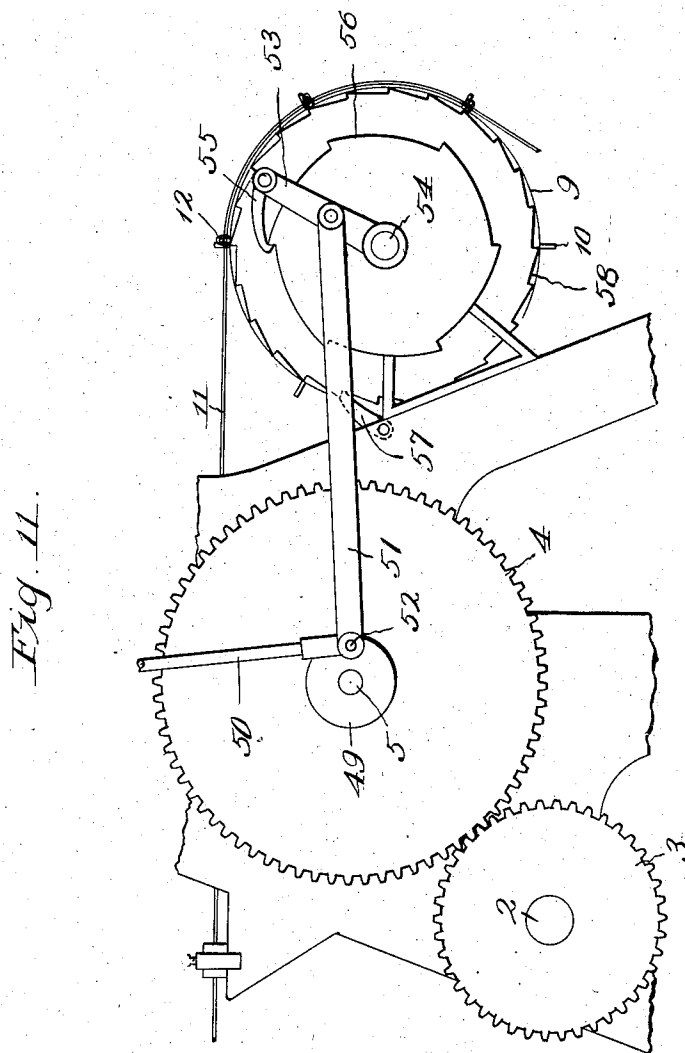
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APPLICATION FILED JUNE 5, 1909.

4 SHEETS—SHEET 4.



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Inventor:
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att'y.

UNITED STATES PATENT OFFICE.

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WILLIAM M. ROOP, OF KANSAS CITY, MISSOURI.

WIRE-FABRIC MACHINE.

1,027,454.

Specification of Letters Patent.

Patented May 28, 1912.

Application filed June 5, 1909. Serial No. 500,456.

To all whom it may concern:

Be it known that I, FREDERICK E. WILLITS, a citizen of the United States, residing at Kansas City, in the county of Jackson and State of Missouri, have invented certain new and useful Improvements in Wire-Fabric Machines, of which the following is a specification.

My invention has reference to a wire fabric machine, and particularly to that class for producing wire fences or poultry netting comprising strand-wires and stay-wires locked at their points of intersection by means of staples.

The particular features of the invention reside in means for producing the staples, and means for securing said staples to the strand-wires and the stay-wires at their points of intersection.

In order that the invention may be fully understood, reference will now be made to the accompanying drawings, in which:

Figure 1 represents a rear elevation of the machine. Fig. 2 is a vertical section of the same on line II—II of Fig. 1. Figs. 3 and 4 are inverted and plan views, respectively, of a pair of dies for securing the staples at the intersections of the strand-wires and the stay-wires. Fig. 5 is a vertical section on line V—V of Fig. 7, showing one of the devices for producing the staples and forcing the same into the dies, the plunger thereof being in a raised position preparatory to forming a staple. Fig. 6 is a similar view of the device with the plunger in its lowermost position just after completing a staple. Fig. 7 is a vertical section on line VII—VII of Fig. 5. Fig. 8 is a vertical section on line VIII—VIII of Fig. 9, showing the staple forming device and the dies which cooperate therewith in forcing the staple around the intersecting portions of the strand-wires and the stay-wires. Fig. 9 is a vertical section on line IX—IX of Fig. 8. Fig. 10 is a cross section on line X—X of Fig. 6. Fig. 11 is a broken side elevation of the machine.

In carrying out the invention I employ a suitable frame 1, in which a drive-shaft 2 is journaled, said drive-shaft being provided at its ends with pinions 3, which intermesh with and drive a pair of cog-wheels 4, fixed upon the ends of a shaft 5, journaled in frame 1, and provided with a plurality of

cams 6, the peripheries of which have raised portions 7 and 8 at the ends thereof.

9 designates a feed-roller mounted at the rear end of frame 1, and having its periphery divided into equal parts by rows of pins 10. Roller 9 is suitably geared to shaft 5, so that each revolution of the latter will turn the roller and feed the fence forward one step, equal to the distance from the center of one row of pins to the center of an adjacent row of pins.

11 designates the strand-wires forming the longitudinal portion of the fence, and 12 designates the stay-wires which are fed at regular intervals upon the strand-wires, and secured thereon at their points of intersection by staples 13.

14 designates a lower set of dies, each of which is provided at its upper surface with intersecting grooves 15 and 16 for the reception of the strand-wires 11 and the stay-wires 12, respectively, which are directed into said grooves by bifurcated guides 17 and 18, respectively, secured to the vertical sides of the dies. The upper surface of each die is also provided with a pair of segmental grooves 19, arranged on opposite sides of groove 16 which they parallel. Dies 14 are mounted upon a cross-bar 20 reciprocally-mounted in frame 1 which has slots 21 to receive the ends of said cross-bar. Cross-bar 20 is provided with a plurality of depending lugs 22 between which antifriction rollers 23 are journaled in the path of cams 6, which engage said rollers at each revolution and raise the lowermost dies 14 into contact with a like number of upper dies 24 secured to the underside of a stationary cross-bar 25. Each die 24 is provided at its under portion with intersecting grooves 26 and 27, which register with grooves 15 and 16, respectively. Grooves 15 have central depressions 15^a for crimping the strand-wires, and grooves 27 have central raised portions 27^a for crimping the stay-wires where they intersect the strand-wires. Each die 24 is also provided at its underside with a segmental groove 28 and a slot 29 arranged at right angles to grooves 19, and on opposite sides of grooves 26 which they parallel. The ends of groove 28 and slot 29 register with the ends of grooves 19, so that when a staple is forced down into the slot

the ends of said staple will enter grooves 19 and be guided by the walls thereof into groove 28 where the ends of the staple meet. Dies 24 have diagonally-opposed holes 30 to receive diagonally-opposed pilot-pins 31 on the lower dies 14, so that when the latter are brought into contact with the former, they will be made to properly register therewith.

32 designates a plurality of staple-forming devices, secured to the upper side of the cross-bar 25, and communicating with slots 29 through slots 33 extending through the cross-bar. Each staple-forming device 32 consists of a housing 34 secured to the upper side of bar 25, a plunger 35 reciprocally-mounted in the housing, a pin 36 near the lower end of the housing, and a spring 37 secured at its upper end to the housing. Plunger 35 has a cutting-edge 38 for cutting up a wire 39 into short lengths from which the staples 13 are produced, and which is fed into the housing through an opening 40 in the front side thereof. Plunger 35 is also provided with a bifurcated lower end 41, which straddles the pin 36 as shown in Fig. 6 in forming the staple. Plunger 35 is also provided with a reduced extension 42 which forces the staples down into the dies and around the strand wires and the stay wires, as shown in Figs. 8 and 9. After a staple has been formed, it is shifted laterally into the path of extension 42 by a fork 43 carried upon the lower terminal of spring 37. As the plunger descends it contacts with a lug 44 on spring 37, and thereby forces the free end of the latter outward with fork 43, which is carried into a recess 45 in the adjacent side of the housing, so as not to interfere with the bending of the staple around pin 36. After a staple has been formed around pin 36, it fits snugly within the bifurcated end of plunger 35, and is carried upward thereby into contact with a stop 46 projecting inwardly from the adjacent side of the housing. Plungers 35 are pivotally connected at their upper ends to a cross-head 47 extending through slots 48 in frame 1 in which cross-head 47 is reciprocally-mounted. Said cross-head is actuated by a pair of disks 49 through the instrumentality of a pair of connecting-bars 50. Disks 49, like cams 6, are fixed to shaft 5 so that the plungers and the lower set of dies will operate in proper time with each other.

51 designates a pair of pitmen pivotally-secured to disks 49 by a pair of wrist-pins 52, and pivotally-secured at their forward ends to a pair of levers 53, pivotally-mounted upon a shaft 54, carrying the feed-roller 9. Levers 53 are provided at their upper ends with pawls 55, which engage ratchet-wheels 56, fixed on shaft 54. Roller 9 is advanced one step at each revolution of the disks 49, through the intermediacy of the intervening mechanism. Roller 9 is prevented from

being turned backward by wires 11, through the intermediacy of a pair of pawls 57, pivoted to the sides of frame 1, and a large pair of ratchet-wheels 58 engaged by said pawls and fixed to the ends of the roller 9.

Having described the construction of the machine, I will now proceed to briefly describe its operation.

The strand-wires 11 are strung between the upper and lower sets of dies, as shown in Fig. 2, and wires 39 are fed to the staple-forming devices 32. Shaft 5 is constantly rotated, and through the intermediacy of the connecting parts forces the plungers downward. In their downward passage the plungers cut the wires 39 into lengths to form the staples 13 and force the latter downward into the segmental grooves of the dies and around the strand wires and the stays. After the plungers have formed the staples, the raised portions 7 of the cams lift the lower set of dies into engagement with the upper set and crimp the strand-wires and the stay wires at their points of intersection. The high portions 7 of the cams now pass out of engagement with rollers 23, and allow the lower set of dies to drop a slight distance, so that the descending plungers may readily force the staples into the grooves 19 and 28, and around the strand wires and the stay wires. After this operation is completed and just before the plungers start to move upward, the high portions 8 of the cams engage the rollers 23, and lift the lower set of dies into contact with the stationary upper set to firmly clench the staples upon the intersecting portions of the strand wires and the stay wire. The cams now pass out of engagement with rollers 23, and allow the lower set of dies to descend out of the path of the stay wire, so that the fence may be moved forward one step preparatory to placing another stay wire in position upon the strand wires.

Having thus described my invention, what I claim is:—

1. In a wire fence machine, a stationary set of dies, a movable set of dies coöperating with the stationary set for grasping the intersecting portions of the wires forming the fence, means for forcing staples into said dies and around the intersecting portions of the wires and means for forcing said movable set of dies firmly into engagement with the staples before and after the same have been forced around the intersecting portions of the wires.

2. In a wire fence machine, a stationary set of dies, a movable set of dies coöperating with the stationary set for grasping the intersecting portions of the wires forming the fence, means for forcing staples into said dies and around the intersecting portions of the wires, and a cam for actuating the movable set of dies, said cam having

means for forcing the movable set of dies firmly into engagement with the staples after the same have been forced around the intersecting portions of the wires.

5 3. In a wire fence machine, a stationary set of dies, a movable set of dies cooperating with the stationary set for grasping the intersecting portions of the wires forming the fence, both sets of dies having means 10 for crimping the intersecting portions of the wires, means for forcing staples into said dies and around the intersecting portions of the wires, and a cam for actuating the movable set of dies, said cam having means 15 for forcing the movable set of dies firmly against the stationary set before the staples are forced around the intersecting portions of the wires.

20 4. In a wire fence machine, a stationary set of dies, a movable set of dies cooperating with the stationary set for grasping the intersecting portions of the wires forming the fence, means for forcing staples into said dies and around the intersecting portions of 25 the wires, a cam for actuating the movable set of dies, said cam having means for forcing the movable set of dies firmly into engagement with the staples after the same have been forced around the intersecting 30 portions of the wires, and means for moving the fence forward one step after each operation of the movable set of dies.

35 5. In a wire fence machine, a stationary set of dies, a movable set of dies cooperating with the stationary set for grasping the intersecting portions of the wires forming the fence, both sets of dies having means for crimping the intersecting portions of the 40 wires, means for forming staples and forcing the same into the dies and around the in-

tersecting portions of the wires, and means coacting with the movable set of dies to temporarily force them firmly into engagement with the intersecting portions of the fence wires to crimp the same before the 45 staples are forced into the dies.

6. In a wire fence machine, a stationary set of dies, a movable set of dies cooperating with the stationary set for grasping the intersecting portions of the wires forming the 50 fence, devices for forming staples and forcing the same into the dies and around the intersecting portions of the wires, a journaled shaft, a cam mounted upon said shaft to actuate the movable set of dies, disks 55 mounted upon the shaft, and connecting-rods operably-connecting said disks and the staple devices.

7. In a wire fence machine, dies to grasp the intersecting portions of the wires forming the fence, a housing communicating with 60 said dies and provided with a projection and an opening which latter is adapted to receive a wire, a plunger for cutting the wire into suitable lengths and bending the same 65 into staples over the projection, an extension on said plunger for forcing the staples into the dies and around the intersecting portions of the fence wires, a resilient member carried by the housing and controlled by the 70 plunger, and a fork carried by said resilient member for shifting the staples into the path of the plunger extension.

In testimony whereof I affix my signature, 75 in the presence of two witnesses.

FREDERICK E. WILLITS.

Witnesses:

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F. G. FISCHER.