(No Model.) 2 Sheets—Sheet 1.

L. KOSS.

WIRE FENCE MACHINE.

No. 547,998. Patented Oct. 15, 1895.

Fig. 1

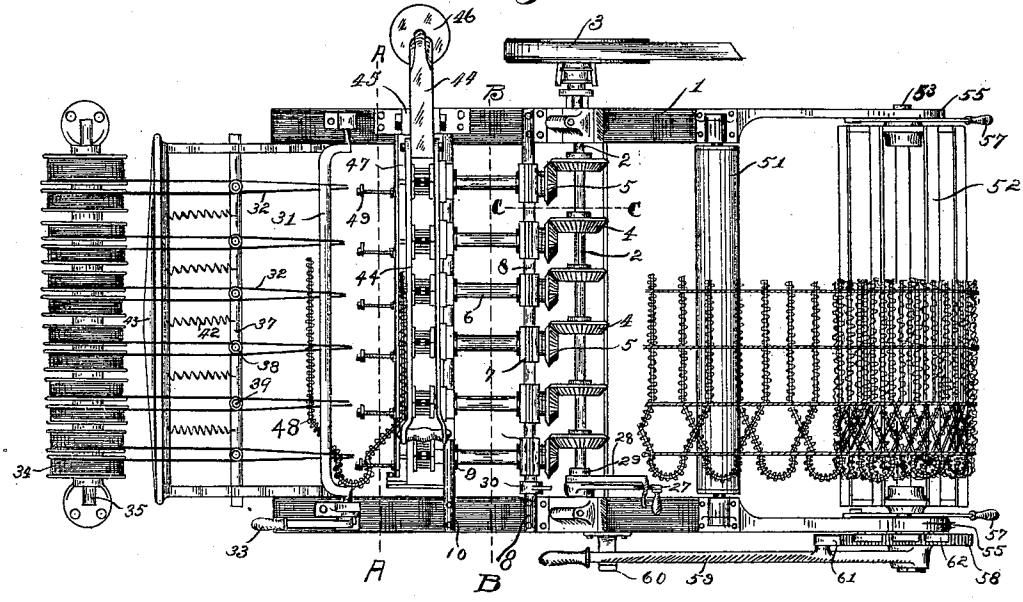


Fig. 2

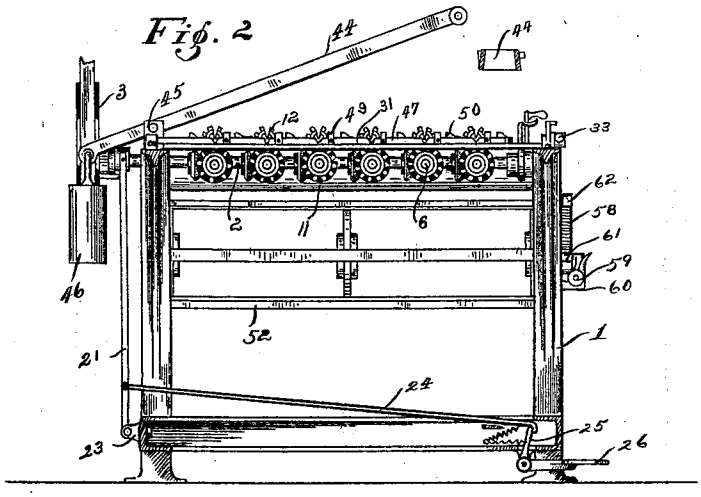
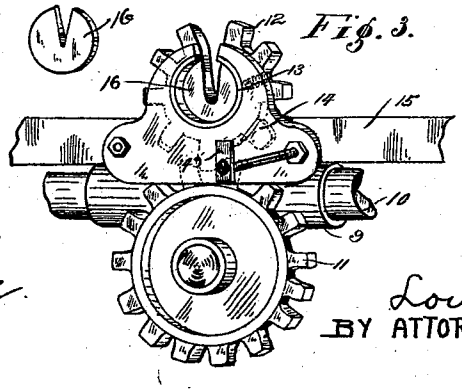


Fig. 3.



WITNESSES.
A. S. Courtright.
L. A. Monroe.

Inventor.
Louis Koss
BY ATTORNEY.
V. H. Lockwood

(No Model.)

2 Sheets—Sheet 2.

L. KOSS.

WIRE FENCE MACHINE.

No. 547,998. Patented Oct. 15, 1895.

Fig. 4.

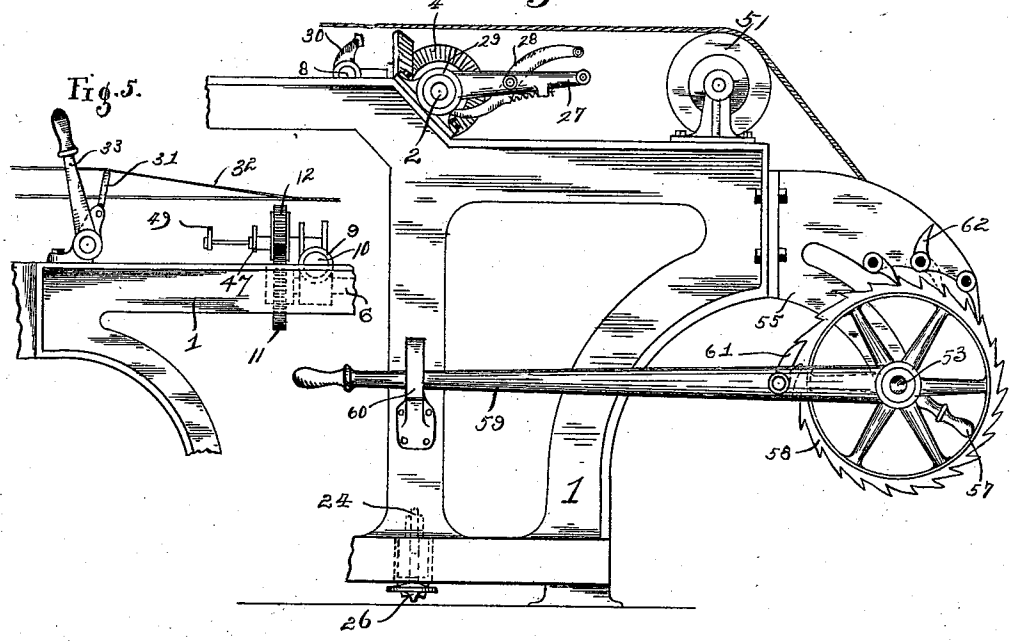


Fig. 5.

Fig. 6

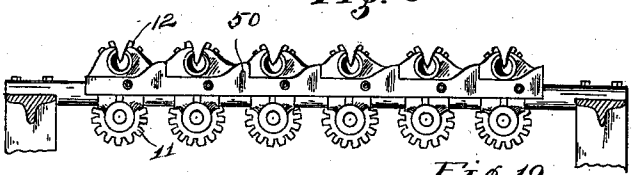


Fig. 7

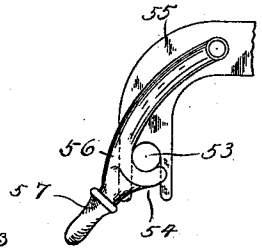


Fig. 8

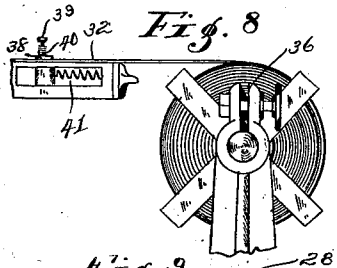


Fig. 10.

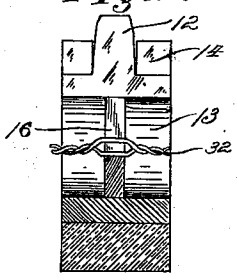


Fig. 11

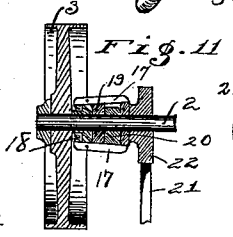


Fig. 12

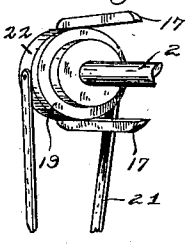


Fig. 9

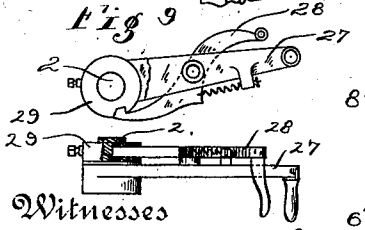
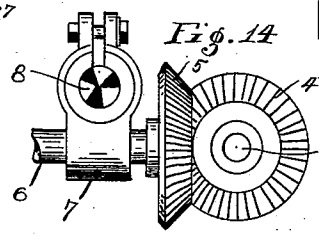


Fig. 14



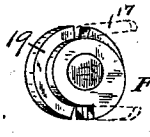


Fig. 13

Witnesses

A. S. Courtright.

L. A. Monroe.

Inventor

Louis Koss

By Attorney W. H. Lockwood

UNITED STATES PATENT OFFICE.

LOUIS KOSS, OF INDIANAPOLIS, INDIANA, ASSIGNOR TO CHARLES W. BRIDGES, OF SAME PLACE.

WIRE-FENCE MACHINE.

SPECIFICATION forming part of Letters Patent No. 547,998, dated October 15, 1895.

Application filed September 13, 1894. Serial No. 522,900. (No model.)

To all whom it may concern:

Be it known that I, LOUIS KOSS, of Indianapolis, county of Marion, and State of Indiana, have invented certain new and useful Improvements in Wire-Fence Machines; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, in which like letters and figures refer to like parts.

This invention relates to a wire-fence machine so constructed as to weave or build a wire fence comprising palings held in place by pairs of intertwisted wires, and especially for the construction of a fence where the palings consist of loops of B B wire.

The nature of the machine, as well as the parts that are new, will appear from the accompanying drawings and the following description and claims.

Figure 1 is a plan view of my machine in operation, a central portion of the wire fence being broken away to show the machine. Fig. 2 is a cross-section of the same on the line A A, Fig. 1. Fig. 3 is a perspective of a twister and its mounting. Fig. 4 is a side elevation of the rear half of the machine. Fig. 5 is a side elevation of the upper central part of the machine, showing the wires lifted out of engagement with the twisters. Fig. 6 is a cross-section of Fig. 1 at B B. Fig. 7 is a detail view of the means of holding in place the reel upon which the wire fence is wound. Fig. 8 is a side elevation of the upper front part of the machine. Fig. 9 gives a side and a bottom view of the lever for adjusting the twisters. Fig. 10 is a cross section of a twister. Fig. 11 is a longitudinal section of the clutch mechanism on the driving-shaft. Figs. 12 and 13 are detail views of the same in perspective. Fig. 14 is a cross-section of the gear mechanism shown at C C, Fig. 1.

My machine is mounted upon a suitable framework 1 high enough to be convenient to operate upon. On this framework I mount a driving-shaft 2, driven by a pulley 3, which in turn may be driven by a belt or other means connected with suitable power. On this driving-shaft 2 I rigidly mount beveled gears, 4 engaging a series of beveled gears 5, rigidly secured to the longitudinally-extending driving-shaft 6, mounted in the boxing 7, suspended from and secured to a cross-bar 8. The other end of the shaft 6 is likewise mounted in a boxing 9 on the cross bar or rod 10, and on the extreme end of such shaft 6 is the spur-wheel 11, which drives the twister-wheel 12. This twister-wheel is provided with collars or laterally-extending flanges 13, which rotate in a suitable bearing in the bracket 14, secured to the cross-bar 15. The upper part of the bracket 14 is cut out, and likewise the twister-ring 12 is radially slotted at one point for the purpose of receiving the tie-wires to be twisted.

16 is a twister, which consists of a disk made of the hardest metal practical and slotted from its periphery to its center. The twister-ring 12 is centrally cored out to receive the twister 16, which is slipped into place and either secured by screws or other means. The twister-ring 12 is provided with spurs engaging the spur-wheel 11, whereby it is driven. This construction of the twisting mechanism is so that the twister can be made of the hardest metal and can be changed if worn or broken, or for any other reason, being independent of the twister-ring in which it is seated and by which it is driven. Across the machine there is a series of six of these twisting mechanisms shown all in line.

The drive mechanism is thrown in and out of gear by the mechanism shown in Figs. 11, 12, and 13, and the foot-levers shown in Fig. 2. On the inner face of the drive-wheel 3, which is loosely mounted on the shaft 2, I pivot two pawls 17, as shown in Fig. 11, so that they extend out from the wheel on the opposite side and parallel with the shaft. Their ends next to the wheel are actuated by springs 18. On the shaft adjoining the wheel is a clutch-ring 19, keyed to the shaft and provided at one place in its periphery with a notch adapted to be engaged by a pawl 17. Beside this clutch-ring 19 is mounted a cam-ring 20, upon whose periphery the pawls 17 rest, whereby they are held out of engagement with or permitted to engage the notch in the clutch-ring 19. The cam-ring 20 is circumferentially grooved almost entirely about

its half next to the clutch-ring, the inner half of the cam-ring being circular. The cam-ring is slidable on the shaft 2, and when moved inward the inner ends of the pawls 17 drop or move into the groove just mentioned. The periphery of this groove is cam-shaped, as shown in Fig. 12, being at one end flush with the outer periphery of the cam-ring 20. When the cam-ring is slipped inward, so that a pawl 17 drops into this groove, the pawl engages the notch in the clutch-ring 19 and drives the shaft around. The cam-face of the groove in the cam-ring 20 when one circuit is made carries the pawl to the point shown on the under side of Fig. 12, where the groove merges into the periphery of the cam-ring 20, when the pawl disengages the notch in the clutch-ring 19 and ceases to drive the shaft 2, the cam-ring 20 at this time moving outward into the position shown in Fig. 11. The sliding movement of this cam-ring 20 is provided for by a vertical lever 21, connected at its top to a collar 22, which is secured to the cam-ring 20 and at its bottom pivoted to the bracket 23 in the framework. Pivoted near the lower end of this lever 21 is a link 24, extending across the lower part of the framework and engaging a small bell-crank lever 25 with a pedal 26 to operate it. The link 24, as well as the bell-crank lever 25, are controlled by springs, so that when the foot is removed from the pedal the springs will tend to drive the cam-ring 20 back into its normal position. The engagement between the link 24 and the bell-crank 25 is such that the former will escape the latter when it is operated, so that if the foot, for any reason, be not removed from the pedal 26 the driving-shaft will still not make more than one revolution. If more than one revolution were made the wires would be twisted so much as to break. The parts of the twisting and driving mechanism are so constructed that when turned once the driving-shaft 2 will rotate the twisting-ring a fraction more than three times, or any other number of times that it may be desired to twist the tie-wires. The object of so gearing the mechanism that it should turn the twisters a little beyond the number of times desired to twist the wire is to enable the operator to readily disengage the tie-wires from the twisters. If they should turn just three times and stop with the slots in a vertical position, the tie-wires would bind so tightly in the twister that they could not readily be lifted out on account of the twisting-tension of the wires. Hence, I turn the twisting-rings a little farther than would otherwise be necessary, thus twisting the tie-wires a little more, and then I return the twisting-wheels back until the slots are in a vertical position, so that the tie-wires in them will slightly relax their twisting-tension and one be upon the other instead of at its side, whereby I can readily lift the wires out of the slots in the twisting-rings. For this purpose I mount on the shaft 2 the hand-lever 27, provided with a spring-actuated pawl 28, having a long handle almost parallel with the lever 27, so that I can grasp the two with one hand, if desired, which pawl is adapted to engage a notch in the ring 29 on the shaft, enabling me to turn the shaft 2 to some extent one way or the other, for the purpose above indicated, there being a stop 30 to limit such movement. This lever mechanism is so placed as to be operated readily by the right hand. To the left is a wire-lifting bar 31, extending across the machine and pivotally mounted in suitable bearings in the framework. It is preferably of the shape shown in Fig. 1, bent down at its ends so that its central part will rise up four or five inches when it is rotated. One of a pair of tie-wires extends above and one below this wire-lifting bar. On one end I place a hand-lever 32, whereby the bar 31 is rotated. By this means with the left hand, when desired, I lift the tie-wires entirely out of the twisters, as seen in Fig. 5. The tie-wires are wound upon suitable spools 34, mounted on the shaft 35, or otherwise held in proper place to be fed to the machine. The shaft 35 may be mounted in an adjustable friction-bearing 36, as shown in Fig. 8, to prevent the unwinding of the spools faster than the wire is fed to the machine. The tie-wires are fed in pairs to the machine resting upon the wire-supporting bar 37, extending across the machine, where they are held by spring-actuated clamps each consisting of a plate 38, resting on the two wires, screw-bolts 39, passing through them, and spiral springs 40 about the screw-bolts, whereby when the plates are screwed down the tension of the spring is increased and the wires more securely clamped to the wire-supporting bar 37. This bar 37 is mounted in the slots 41 in the framework, as shown in Fig. 8, whereby it is slightly movable and is held in place by the springs 42, that extend from the plate 37 to the end frame-piece 43 of the machine. By this construction the tie-wires are kept stretched and taut as they are fed to the machine, but are not so securely held on the bar 37 that they will not slip, as they are at the other end wound on the reel.

The tie-wires are forced down into the twisters by a pair of parallel pressure-bars 44, (shown in Fig. 2,) pivoted near one end on one side of the machine 45 and weighted at that end by the weight 46. These pressure-bars are made in cross-section, as shown in the detached view in Fig. 2, and somewhat flaring at the bottom, so as to readily be pressed down with one bar on each side of the series of twisters. As soon as the tie-wires are thus forced down into the twisters the pressure-bar is released, whereupon it assumes the position shown in Figs. 1 and 2.

47 is a gage-bar provided with slots along its top registering with the slots in the twisters, and its object is to limit the twisting of

the tie-wires to certain dimensions. One-half of the twist will be between the twister and and this gage-bar. Hence this bar is so secured that it can be adjusted and placed at any desired distance from the twisters. Of course, instead of a continuous bar sectional bars could be used for each twister, or any other means which would readily occur to any mechanic as an equivalent for this gage-bar. The limit of twist of the tie-wires on the other side of the twisters is fixed by the palings. In order that the palings 48 may be readily placed and maintained in a straight and regular position, I provide a series of guides 49 on one side of the twisters and a guide-bar 50, as shown in Fig. 6, on the other side of the twister. Where the paling consists of only one piece or arm, the latter is all that is required, but where it consists of two arms, as that shown in Fig. 1, both series are required. Of course, their distance from each other and from the twisters can be altered and should be changed to agree with the material that is to form the palings. The guard 50 consists of a cross-bar bolted to the machine and provided with upwardly-extending flanges to form the guards.

After the wire fence is woven it passes over the roll 51 and is wound on the reel 52, that is mounted on the shaft 53, extending across the rear of the machine and held in slots 54 in the lower end of the downwardly-curved arms 55 by means of the pivoted hook or spur 56, having a handle 57. The purpose of this construction is to enable the operator to quickly remove the reel. On one end of the reel-shaft 53 is a large ratchet-wheel 58, provided with a hand-lever 59, with its outer end resting in the bracket 60 near where the operator stands to do the work. This latter mechanism is for the purpose of winding the wire on the reel, an actuating-pawl 61 being pivoted to the hand-lever 59, whereby it engages the ratchet 58, and three pawls 62 are pivoted to the framework, where they will engage the ratchet-wheel differentially for the purpose of holding it in place and keeping the wire fence taut as it is being made.

Having explained the construction of my machine, little need be said further about its operation. After the tie-wires are put in place and stretched with their ends secured to the reel 52, the operator, while standing at the end of the series of twisters, puts the palings in place, brings down the pressure-bars 44 to force the tie-wires into the twisters, and at the same time places his foot on the pedal 26 and starts the twisting mechanism in operation. After the twist is effected he operates the lever 27 to return the slots in the twisters to a vertical position. Then, by operating the lever 33, the bar 31 lifts the tie-wires out of the twisters. He then operates the lever 59, whereby he winds the fence thus woven on the reel. This operation is repeated. It is thus seen that the machine is simple and easy for one man to operate, that it winds the wire fence as the same is made, and that the power is continuous and can be transmitted by a belt from any convenient source, and that the wire is kept taut at all times. I have a machine capable of doing very rapid work, as well as work of a high quality.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a wire fence machine, suitable twisters, a shaft, a driving pulley loosely mounted on the shaft, a spring actuated pawl mounted on the hub of the pulley and extending parallel with the shaft, a clutch ring keyed to the shaft and having a stop on its periphery, a non-rotatable cam ring on the inner part of whose periphery the end of the pawl will rotate and having a cam-shaped groove on the outer part of its periphery, a lever mechanism for sliding such cam ring on the shaft away from the pulley hub whereby the pawl will be led into engagement with the stop on the clutch ring, and connecting gears whereby the twisters are driven by the shaft.

2. In a wire fence machine, suitable twisters, a shaft, a pulley mounted on such shaft, gears connecting such shaft with the twisters so that one rotation of the shaft will rotate the twisters slightly farther than is necessary to make the desired number of twists, means for throwing such drive mechanism out of gear, and a hand lever mounted on such shaft whereby it and the twisters can be reversed.

3. In a wire fence machine, suitable twisters, means for actuating the twisters, and a vertically movable wire supporting bar extending between each pair of tie wires and adapted to remove the tie wires from the twisters.

4. In a wire fence machine, suitable twisters, means for actuating the twisters, a wire supporting bar extending across the machine and having crank ends mounted in suitable bearings on the framework, and a hand lever on one end, whereby, when such hand lever is operated, the bar will lift the tie wires of the fence out of the twisters.

5. In a wire fence machine, a series of twisters in a row, and a pressure bar consisting of two parallel strips adapted when operated to engage the tie wires on each side of the twisters and press them into the twisters.

6. In a wire fence machine, a series of twisters in a row, a pressure bar pivoted at one end to the framework and weighted so that normally it will be held out of engagement, such bar being formed of two parallel strips so that when operated one strip will pass on each side of the row of twisters and press the tie wires into the twisters.

7. In a wire fence machine, a row of stationary twisters, a stationary gage bar on one side of such twisters with slots registering with the slots in the twisters, and a vertically mov-

able wire supporting bar adapted when operated to lift the tie wires out of the slots in the twisters and gage bar.

8. In a wire fence machine, a series of twisters, means for drawing the tie wires through the twisters, a spring-controlled movable cross bar mounted in the framework and supporting the tie wires, spring actuated clamping plates resting on each pair of tie wires, and set screws for regulating the pressure of such clamping plates whereby the tie wires will be kept taut while being fed to the twisters.

In witness whereof I have hereunto set my hand this 1st day of September, 1894.

LOUIS KOSS.

Witnesses:
ISAAC SPRINGER,
GEO. C. CONNER.