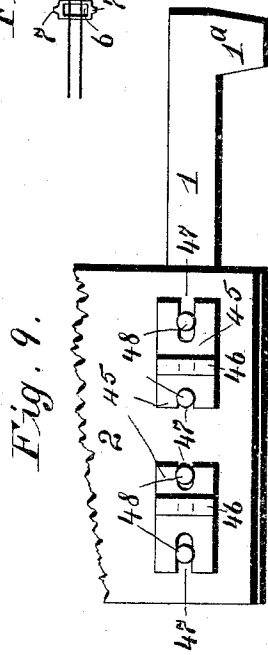
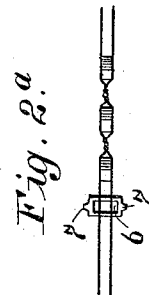
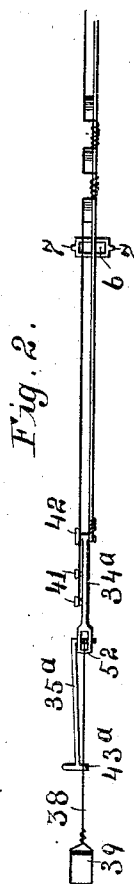
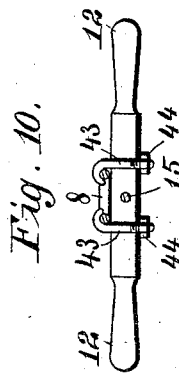
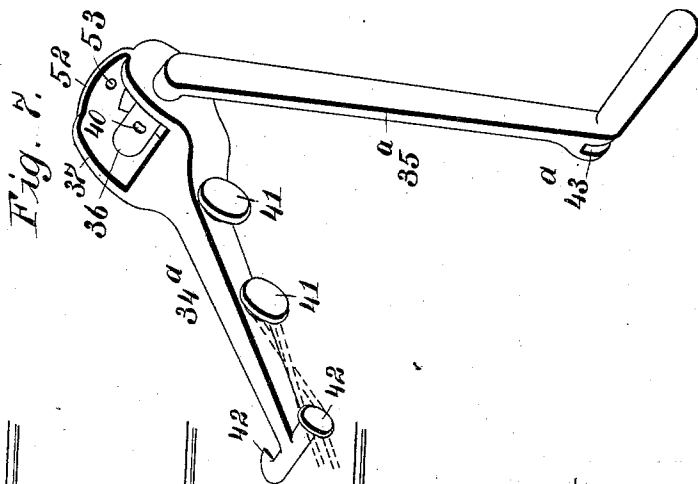
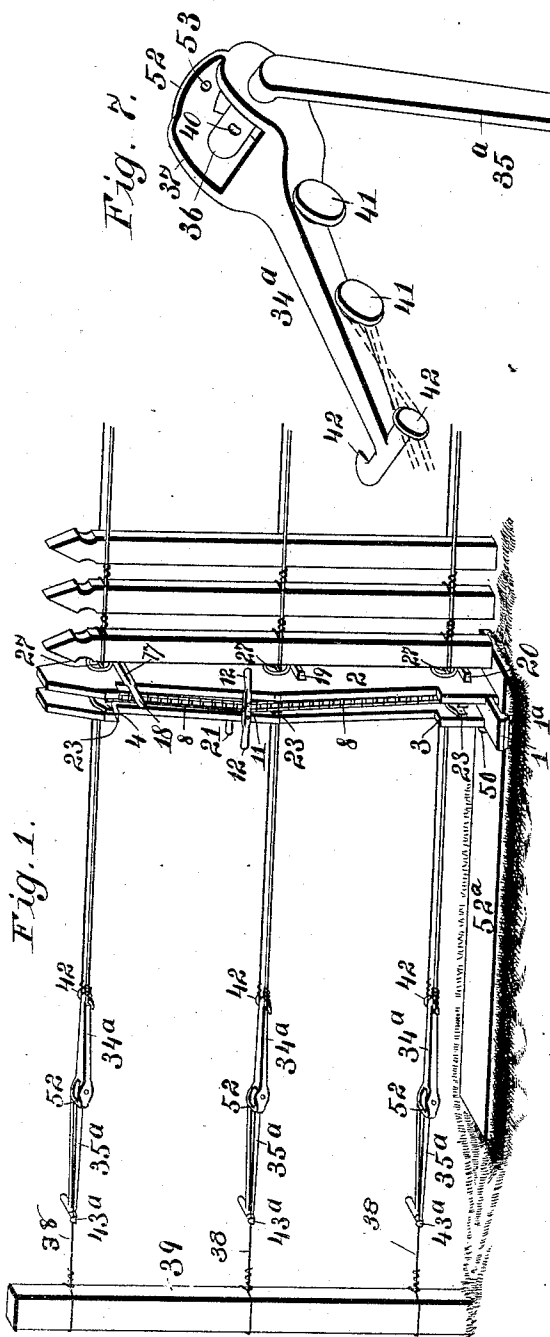


J. M. GRAHAM.
FENCE BUILDING MACHINE.

No. 474,009.

Patented May 3, 1892.



Witnesses:
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UNITED STATES PATENT OFFICE.

JOHN M. GRAHAM, OF JOHNSTOWN, MISSOURI.

FENCE-BUILDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 474,009, dated May 3, 1892.

Application filed June 27, 1891. Serial No. 397,733. (No model.)

To all whom it may concern:

Be it known that I, JOHN M. GRAHAM, of Johnstown, Bates county, Missouri, have invented certain new and useful Improvements in Fence-Building Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

My invention relates to machines for building that class of fences which are composed of vertical pickets held in place by horizontal wires, which are caused to embrace the pickets and which are twisted either one around the other or both around each other between each two of the pickets.

The objects of my invention are to produce a simple, durable, compact, and inexpensive machine which shall be easily portable and readily operated and which shall build the fences with great rapidity and in the strongest and most durable manner.

To the above purposes my invention consists in certain peculiar and novel features of construction and arrangement, as hereinafter described, and pointed out in the claims.

In order that my invention may be fully understood, I will proceed to describe it with reference to the accompanying drawings, in which—

Figure 1 is a perspective view of a portion of a wire-and-picket fence with my improved fence-building mechanism applied thereto, one of each pair of horizontal wires being twisted around the other. Fig. 2 is a plan view of the fence and my improved machine, shown in Fig. 1, the frame-work holding and operating the twist-ers being omitted. Fig. 2^a is a similar plan view of a portion of a wire-and-picket fence and my improved machine, showing a modified form of twist for the retaining-wires, both of the horizontal wires of each pair being twisted around each other. Fig. 3 is a perspective view of the fence-building mechanism, the near standard of the machine being partly removed. Fig. 4 is a central transverse vertical section of the machine. Fig. 5 is a vertical longitudinal section of one of the twisting-hubs and its bearing-flanges. Fig. 6 is an end elevation of one of the twisting-hubs viewed toward that end which controls the form of the twist. Fig. 7 is a detached perspective view of one

of the tension devices employed in connection with the building-machine. Fig. 8 is a detached perspective view of the stop-plate. Fig. 9 is a side elevation of the lower part of one of the standards of the machine, showing the brackets for the carrying wheel or roller, said roller being removed. Fig. 10 is a detached plan view of the operating handle-bar of the machine, showing parts of the tension devices for the sprocket-chain. Fig. 11 is a side elevation of the machine on a reduced scale and viewed toward the side opposite from that shown in Fig. 1. Fig. 12 is a perspective view of the lower part of the machine-frame, showing its carrying-truck.

In the said drawings, 1 designates the base-plate of my improved fence-building machine, the said base-plate being of elongated rectangular form, and being also preferably constructed of wood.

2 designates the two upright frame-pieces or standards of the machine, said standards being also preferably of wood and standing parallel with each other, as shown. Upon the lower part of one side or edge of each of these standards 2 is formed a shoulder 3, extending horizontally outward from the frame, and the upper part of these sides or edges of the standards are also formed with horizontally and outwardly extending shoulders 4. The purpose of these shoulders will be hereinafter explained.

The lower ends of the standards 2 are suitably bolted or otherwise firmly secured to the sides of the base 1, and the upper parts of said standards are connected and braced together by a cross-piece 5, the ends of which are firmly bolted to the standards and which lies between the inner sides of the two standards, as shown. At intervals between the two standards are mounted a number of twisting-hubs 6, the outer surface or peripheries of which are formed with sprocket-teeth 7 and which are of peculiar internal construction, as hereinafter described. Three of these twisting-hubs 6 are shown arranged one above another, and this is the number which is generally employed; but it is to be understood that the precise number of hubs may be increased or diminished at pleasure without departing from the essential spirit of my invention.

8 designates a sprocket-chain, which runs

over the upper twisting-hub 6, then under the lower twisting-hub 6, and finally one strand of said chain runs in contact with one side of the middle hub, as shown. That part of the sprocket-chain which runs in contact with the middle hub 6 also runs in contact with two rollers 9, which are journaled horizontally between the standards 2 above and below the said middle hub, said rollers running upon bolts 10, which pass transversely through the side pieces or standards. Thus the sprocket-chain runs in contact with one side of each roller 9 and against the opposite side of the middle hub 6 and is retained by the rollers in engagement with the teeth of the middle hub. The ends of this sprocket-chain are connected to a cross handle-bar 11, which is provided at each end with a handle 12. The sides of the link at one end of this sprocket-chain are embraced by the hooked inner ends of two horizontal bolts 43, each of said bolts passing transversely through the handle-bar 11, and said bolts being externally screw-threaded at their outer ends to receive nuts 44, which abut against the outer sides of the handle-bar. The link at the other end of the chain is connected to a hook at the lower end of a tension-bolt 15. This bolt passes vertically through the bar 11, and upon its upper end is secured a nut 16, which rests upon the bar 11. It will be seen that by virtue of this construction the chain 8 can be tightened or loosened, as desired, it being only necessary to turn the nut in one direction or the other in order to vary the length and tension of the chain 8. It will be further seen that by moving the handle-bar 11 upward or downward beneath the shoulders 3 and 4, which limit its movements, the chain 8 will be caused to run over the hubs 6 and cause the latter to rotate axially, for a purpose to be explained hereinafter.

One of the standards 2 is provided on its outer side at the upper part thereof with a projecting arm 17, at the front end of which is formed a handle 18, while two other projections 19 and 20 are formed upon or secured to the outer side of this standard, the projection 19 being about midway of the length of the standard and the projection 20 being at the lower end thereof. The opposite standard 2 is provided at its outer side about midway of its length with a handle 21.

Each of the hubs 6 is set at its ends in bearing-plates 23, which are reduced marginally on curved lines, as shown, and which are bolted to the inner sides of the standards 2, and each of which is also formed with a circular boss 24, projecting outward in a correspondingly-shaped opening in the standard 2. At its outer side each of these bosses and bearing-plates is formed with a horizontal slot 25, from which extend divergent flanges 26, as shown, the said slots opening through corresponding apertures in the edges of the standards. Each of the hubs 6 is of hollow tubular form and is composed of two semi-

cylindrical portions united together at one end only by an integral transverse portion 28 and at the opposite end by an integral cross-bar 27, which lies within the hub, so that the ends of the bar join the surface of the hub at points within the adjacent outer end of the same. This bar is of narrow or flat form transversely and is located adjacent to that end of the hub which extends toward the picket which is being secured between the fence-wires, and which is thus enabled to spread the wires apart or to separate them for the insertion of the picket, as hereinafter explained. From this description it will be seen that each hub is split longitudinally, with the transverse portion 28 and the cross-bar 27 serving as the only connections between the two parts of the hub. One end of the hub is formed with two oppositely-disposed recesses 29 and 30, which are placed in alignment with each other at opposite points from the center of the hub and which are opposite continuations of the longitudinal split just referred to. One of these recesses 29 is a short recess terminating near the circumference of the hub, while the other recess 30 extends from the circumference of the hub to and slightly beyond its center. These ends of the hubs 6 are each provided with a stop-plate 31, each of which is formed at one end with a lip or flange 32, which enters the longer recess 30, and said stop-plate is also provided with an elongated slot or opening 33, through which passes a stud 34, which projects from the end of the hub and which receives a nut 35 for retaining the stop-plate in position, as shown.

In Figs. 9 and 12 I have shown an attachment for facilitating the movements of the machine. This attachment consists of two plates 45, from the outer surface of each of which projects a bracket 46, and each of which is formed at its ends with oppositely-disposed recesses 47. Through these recesses extend studs or pins 48, which project outwardly from the lower end of the support or standard 2, which is opposite from the picket, being inserted between the wires of the fence. Between these two brackets 46 is located a double truck-wheel 50, having a central connecting-hub 51, through which extends an axle-pin 49, said axle-pin also resting at its ends in the outer parts of the brackets 46. A board 52 or similar track way is laid upon the ground beneath the fence-wires, as shown in Fig. 1, and as the machine is tilted laterally to make room for another picket the wheel 50 comes into contact with the board and the machine runs upon said wheel. Thus all necessity of lifting and awkwardly dragging the machine is avoided. It is to be understood that while this is a desirable attachment for the machine, it may be dispensed with without departing from the essential spirit of my invention.

In using this machine the wires for the fence are first connected in pairs to one of

the fence-posts (not shown) and the opposite portions of the wires are connected to a tension device 34^a, as hereinafter more particularly described. This tension device is provided with a crank-handle 35^a, which has a barrel or stem 36, arranged to pass into ears 37 on one end of the tension device 34^a and to revolve therein. One end of a straining wire or rope 38 is attached to a suitable post or stake 39, and the other end of this wire or rope is attached to a hole 40 in the barrel 36. One end of the sprocket-chain 8 is now disconnected from the hook of the tension-bolt 15 and the sprocket-chain is removed from the machine, the hubs 6 having been first set with their recesses 30 in register with the recesses 25 in the bearing-plates. The two wires of each set are now placed in one of the hubs 6 in either of the following ways: If it is desired to twist both wires around each other, as is shown in Fig. 2^a, one wire is inserted into the recess 29 and the other wire is inserted into the recess 30 outside of the stop-plate 31. When one wire is to be left straight and the other twisted around it, as shown in Figs. 1 and 2, the straight wire is connected to the hook 42 of the tension-bar 34^a and the nut 35 is loosened so as to allow the stop-plate to be removed, and the wire is inserted into the recess 30 and passes clear back until it strikes the inner end of said recess, and thus passes through the center of the hub, after which the stop-plate is set in position, the other wire remaining, as before, in the recess 29. Where both wires are to be twisted, they are bent one or more times over and under the stubs or knobs 41 on the tension device 34^a, as shown in Fig. 1; but when only one wire is to be twisted the wire which is to remain straight is bent around a hook 42 on the tension device. The sprocket-chain is now replaced upon the machine and the handles 35^a of the tension devices 34^a are turned so as to strain the wires. The handle 35^a is brought down so that a stud or projection 43^a on the outer end of the handle shall engage beneath one of the wires which connect the tension device with the post 39, and thus prevents the handle from turning backward when released. In order to avoid all possibility of breaking off one or both of the ears 37 of this tension device, said ears are connected by an integral cross-bar 52, said bar being preferably provided with an opening 53 for the passage of the straining-wire. Now in order to insert a picket, the two wires of each set must be separated to afford space for the picket to enter. This is done by resting the machine upon one corner of its base and turning it pivotally sidewise, so that one wire can spring out of the passage 25, while the bar 27 holds the other wire back, the sprocket-chain 8 being slack enough to yield sufficiently for this purpose. The said bar 27 is upon that side of the machine which is adjacent to the picket being inserted, and thus it will be seen that the separation or spreading apart of the wires

by the bar 27 enables the picket to be inserted readily between the two wires. It will also be seen that owing to the flat form of the cross-bar this separation of the wires can be effected as well when one wire is passed through the center of the opposite end of the hub as when both wires are passed through said end of the hub away from its center. After the picket has been inserted the operator places his foot upon the base 1 and the handle-bar 11 is forced downward until it strikes the shoulder 3, causing the wires to be twisted upon each other or only one upon the other, as the case may be, by the rotation of the hubs. Another picket is inserted and the handle-bar 11 is moved upward until it strikes the shoulder 4, making a second twist opposite in direction from the first twist, the operator's foot still resting upon the base 1, and thus inclosing each picket in two twists of each pair of wires, the shoulders 3 and 4 thus limiting the movements of the chain to properly rotate the twisting-hubs. After each picket has been inserted and before the twist has been made the machine is pushed forcibly against the picket, so as to cause the projections 17 19 20 to strike the picket, and thus drive it finally against the last twists made.

The outer end of the base 1 is provided with a downwardly-extending flange or projection 1^a, which serves to properly retain the machine upon the base 1 as the fence is being built.

From the above description it will be seen that I have devised a simple, durable, and inexpensive fence-building machine, which is extremely rapid in operation and which is very easy to operate, and, moreover, which will make either a twist of both wires or of only one wire, as described, without necessitating any material alteration of the machine.

Having thus described my invention, what I claim as new therein, and desire to secure by Letters Patent, is—

1. An improved fence-building machine comprising a suitable frame-work having externally-projecting upper and lower shoulders at one side, a number of revoluble twisting-hubs, each of hollow tubular form, having a single thin internal transverse spreader-bar located adjacent to that side of the machine which stands next to the picket being secured between the fence-wires, having, also, each a transverse radial slot formed at its opposite end, provided, also, with external sprocket-teeth and with a removable and adjustable stop-plate located in said slot, a pair of bearing-plates for each hub, secured in opposite sides of the supporting-frame of the machine and having each a circular boss provided with an opening at one side and with divergent flanges adjacent to the opening, and a sprocket-chain extending over the twisting-hubs and having a transverse handle-bar working between the upper and lower shoulders of the frame, substantially as set forth.

2. An improved fence-building machine comprising a suitable frame-work having ex-

ternally-projecting upper and lower shoulders at one side, a number of revoluble twisting-hubs, each of hollow tubular form and having each external sprocket-teeth, a pair of bearing-plates for each hub, secured in opposite sides of the supporting-frame and having each a circular boss provided with an opening at one side and with divergent flanges adjacent to said opening, and a sprocket-chain extending over the twisting-hubs and having a transverse handle-bar working between the upper and lower shoulders of the frame-work, substantially as set forth.

3. In a fence-building machine, a tension-bar having a number of studs or knobs at one of its sides and designed to receive the fence-wires, a hook projecting laterally from one end of said bar and designed to receive one of the fence-wires, and a revoluble drum provided with a crank-handle and located at the opposite end of the bar from that occupied by the hook, said drum being designed to receive a straining-wire, substantially as set forth.

4. In a fence-building machine, the tension-bar having a number of studs or knobs formed at one side of the bar and designed to receive the fence-wires, a hook extending laterally from one end of the bar and designed to re-

ceive one of the fence-wires, a pair of ears located at the opposite end of the bar from that occupied by the hook, a connecting-bar for said ears, and a revoluble drum working in said ears and provided at one end with a crank-handle, substantially as set forth.

5. An improved fence-building machine comprising a pair of supporting-standards for the operative parts of the machine, a number of twisting-hubs mounted in said standards and having each a series of external sprocket-teeth, a sprocket-chain running over said hubs, a cross handle-bar for connecting the ends of the sprocket-chain, a hooked bolt extending vertically through the bar and connected to one end of the chain, a pair of hooked bolts extending horizontally through said handle-bar and connected to the opposite end of the sprocket-chain, and a tension-nut screwed upon the upper end of the vertical bolt, substantially as set forth.

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

JOHN M. GRAHAM.

Witnesses:

JNO. L. CONDRON,

H. E. PRICE.