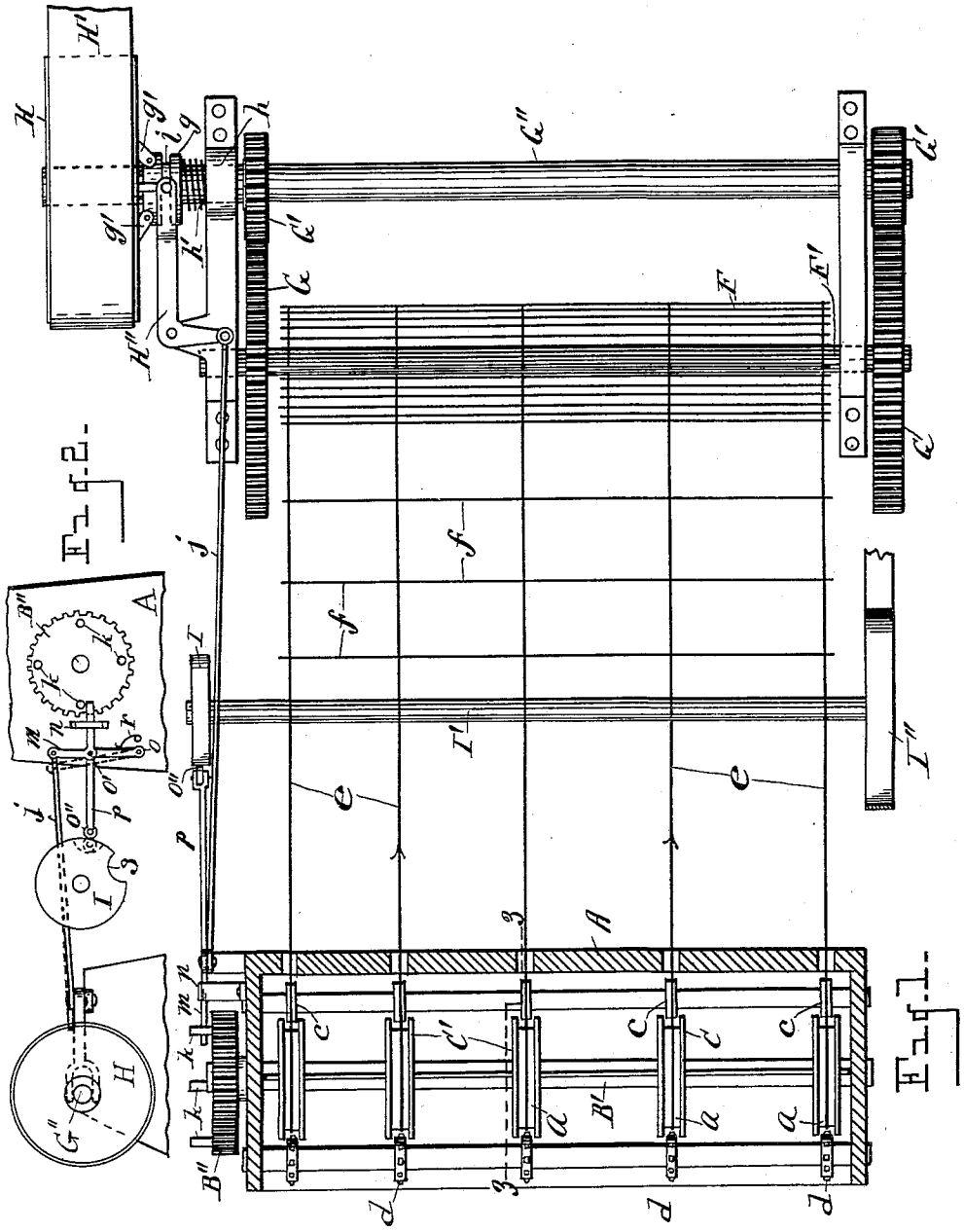
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FEED MECHANISM FOR WIRE FABRIC MACHINES.

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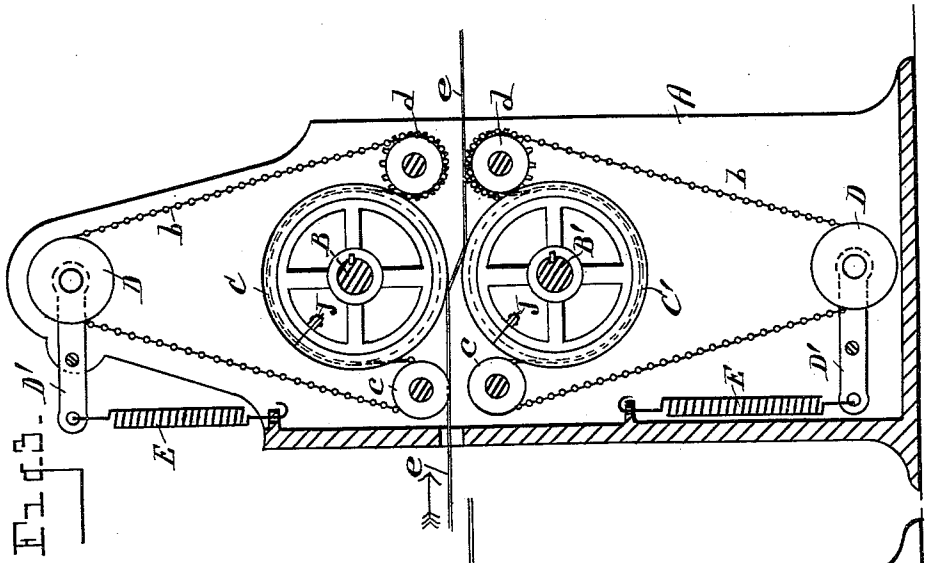


Fig. 1.

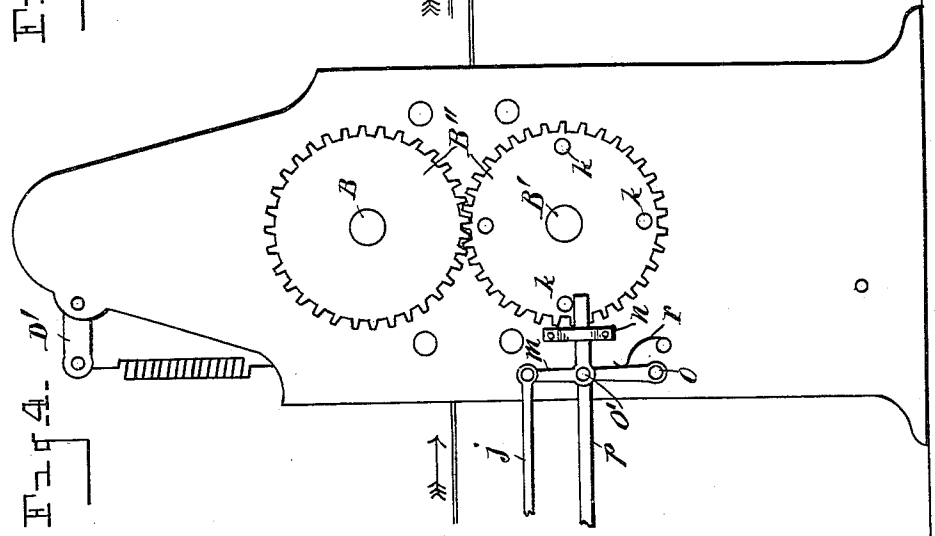


Fig. 4.

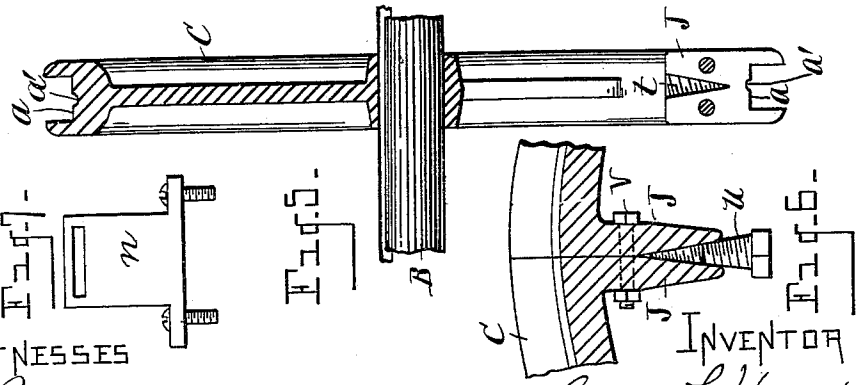


Fig. 2.

Fig. 7.

Fig. 5.

Fig. 6.

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UNITED STATES PATENT OFFICE.

GEORGE L. HOXIE, OF ADRIAN, MICHIGAN.

FEED MECHANISM FOR WIRE-FABRIC MACHINES.

SPECIFICATION forming part of Letters Patent No. 620,589, dated March 7, 1899.

Application filed December 15, 1898. Serial No. 699,335. (No model.)

To all whom it may concern:

Be it known that I, GEORGE L. HOXIE, a citizen of the United States, residing at Adrian, in the county of Lenawee, State of Michigan, have invented certain new and useful Improvements in Machines for Forming Wire Fabrics; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to new and useful improvements in machines for forming wire fabric; and it consists in the construction and arrangement of parts hereinafter fully set forth, and pointed out particularly in the claims.

The objects of the invention are to provide means for feeding the warp or longitudinal wires of the fabric so as to render them all of uniform length, preventing one edge of the fabric from running ahead of the other and obviating the cross-wires assuming an oblique position; to provide for spacing the cross-wires so that they shall stand at an equal distance apart and that there shall be a certain number within a given space; to provide for operating the reel upon which the fabric is wound so as to draw upon said fabric evenly and place such tension thereon as to hold the fabric taut and prevent a kinking of the longitudinal or warp wires and their tendency to spring back as they are wound upon the reel, and to impart an intermittent movement to said reel at proper intervals. These objects are attained by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a plan view, partly in section, of a wire-fabric machine embodying my invention. Fig. 2 is a detail in elevation of the wire-feeding and reel-actuating mechanism. Fig. 3 is a vertical transverse section through the wire-feeding portion of the machine. Fig. 4 is an end elevation thereof. Fig. 5 is an enlarged diametrical section through one of the wire-feeding wheels. Fig. 6 is an enlarged detail in section, showing means for slightly changing the diameter thereof. Fig. 7 is a detail of a keeper.

Referring to the letters of reference, A designates a suitable frame in which is journaled a horizontal shaft B, carrying thereon a series of grooved wheels C, which are keyed thereto and adapted to slide longitudinally, as shown in Fig. 5. Below the shaft B and also journaled in the frame is a second shaft B′, having mounted thereon in similar manner a second series of grooved wheels C′, which register vertically with the wheels C above them.

The peripheries of each of the series of wheels C and C′ are channeled circumferentially, as at *a*, and at the base of said channel is a half-round groove *a*′, (see Fig. 5,) in which the wire is adapted to lie.

The channel *a* in the periphery of each of the series of wheels C and C′ is adapted to receive a sprocket-chain *b*, which passes over a grooved wheel *c* on one side of said wheels and over a sprocket-wheel *d* on the other side thereof, said grooved wheel and sprocket-wheel being so located with respect to each other as to cause the sprocket-chain to traverse the greater portion of the arc of the large feed-wheel when passing from one to the other, as clearly shown in Fig. 3. To keep each of said sprocket-chains tight and to hold them within the groove in the periphery of the feed-wheels, they are caused to pass over a grooved idle-wheel D, journaled independently upon a pivoted lever D′, to the end of which a coiled spring E is attached, the force of which is exerted upon the lever D′ to keep the sprocket-chains drawn snugly around the periphery of the feed-wheels, so as to confine the longitudinal or warp wires of the fabric *e* within the channel at the base of the groove in said wheels. The wires *e* are fed into the machine in the direction indicated by the arrow and are caused to pass around the series of wheels C, thence around the series of wheels C′, beneath the chains embracing said wheels, which compel the wires to lie closely to the periphery of said wheels within the groove *a*′ and prevent the wires from escaping from the channels *a*. After passing around the series of wheels C′ the wires are fed outward through the machine to the reel F, upon which they are wound after the cross or woof wires *f* have been secured thereto in a suitable manner by means not shown. It is the drawing upon said longitudinal wires by means of the rotation of the reel which causes

them to feed through the machine and because of the fact that they are passed around the feed-wheels in the manner described and caused to lie closely to the periphery thereof. By reason of the embracing sprocket-chains said wires cannot slip nor feed one in advance of the others. Therefore when drawn out by the reel they are of uniform length and of equal tension, producing a fabric in which the warp-wires do not buckle or sag and in which the cross-wires stand truly at right angles thereto.

Upon the projecting outer ends of the horizontal shafts B and B′ are the meshing gear-wheels B″, which prevent by any possibility one of said shafts turning in advance of the other, therefore causing all of said grooved feed-wheels to turn in perfect unison.

The reel F is mounted upon a shaft F′, journaled in the frame, carrying at its opposite ends the gear-wheels G, which mesh with the pinions G′, mounted upon the parallel shaft G″, also journaled in the frame. Upon the outer end of the shaft G″ is a loose pulley H, which is driven by means of a belt H′ from any suitable source of power. Mounted upon the shaft G″, so as to turn therewith, but adapted to slide longitudinally thereon, is a collar *g*, to which are attached pivoted arms *g′*, adapted to operate suitable frictional shoes (not shown) which bear against the inner arc of the wheel H and may be of any of the constructions well known in the art. In the periphery of the collar *g* is a groove *i*, which receives a pin projecting from the bell-crank lever H″, pivoted on the frame. Environing the end of the shaft G″, between the bearing *h* and the collar *g*, is a strong coiled spring *h′*, which is adapted to slide said collar longitudinally and force the friction-shoes (not shown) carried by the arms *g′* against the inner arc of the wheel H with sufficient force to cause said collar to turn with said wheel, thereby driving the shaft G″ and rotating the reel F. To stop the rotation of the reel F, the rod *j* is drawn upon to actuate the lever H″ by means hereinafter described and move the collar *g* upon the shaft against the action of the spring *h′*, thereby decreasing the force with which the friction-shoes (not shown) bear against the inner arc of the wheel H and stopping the rotation of the shaft G″.

The longitudinal or warp wires *e* of the fabric are drawn through the machine intermittently, and the distance the wires are carried by each movement of the reel is regulated according to the space between the cross-wires *f*, so that said cross-wires may be attached to the longitudinal wires a uniform distance apart. The means employed for spacing the cross-wires is shown more particularly in Figs. 1, 2, and 4, and consist in providing the outer face of one of the gears B″ on the shaft of the feed-wheels with projecting pins *k*, set at such distance apart as to correspond with the desired space between the cross-wires. A pivoted bell-crank lever *m*, to one end of which the rod *j* is attached, is so mounted that the other end thereof normally extends into the path of the pins *k*, projecting from the gear B″, said lever adjacent to said gear-wheel being supported in a slotted keeper *n*, which permits of a vertical movement of the horizontal end of said lever. Pivoted to the frame, as at *o*, Fig. 2, is a bell-brank lever *p*, to the angle of which the lever *m* is pivoted, as at *o′*. The outer horizontal end of the lever *p* carries an antifriction-roller *o″*, which is adapted to travel in contact with the surface of a cam-wheel I, carried by the transverse shaft I′ and driven through the medium of the pulley I″ thereon. Bearing against the vertical portion of the lever *p* is a spring *r*, which tends to force said lever rearwardly and hold the roller *o″* in the end thereof in contact with the face of the cam-wheel I.

In the normal position of the parts the reel is driven through the friction-clutch on the shaft G″, before described, and caused to wind the longitudinal wires *e* thereon, thereby drawing said wires through the feed-wheels and causing a rotation of the gear B″, carrying the stop-pins *k*. When the required length of longitudinal wires has been drawn out by the action of the reel, one of said pins *k* will engage the projecting end of the lever *m*, which normally extends into the path thereof, and carry downward the end of said lever the limit of its vertical movement in the keeper *n*, thereby causing it to swing upon its pivot *o′* and draw upon the rod *j*, which operation actuates the lever H″ to slide the collar *g* and release the clutch mechanism, permitting the wheel H to turn without driving the shaft G″, and thereby stopping the movement of the reel F. During the time the reel remains at rest a cross-wire *f* by any suitable means (not shown) is attached to the longitudinal wires, after the accomplishment of which the cam-wheel I, which has a continuous movement, is so timed as to present the low point *s* thereof in line with the roller *o″* in the end of the lever *p*, when the spring *r* will cause the roller in said lever to follow the depression in said cam-wheel, causing said lever to swing upon the pivot *o* and carry with it the lever *m*, whereby the horizontal end of said last-mentioned lever is withdrawn from the path of the engaging pin *k*, when the force of the spring *h′* will slide the collar *g* on the shaft G″, so as to cause the friction mechanism to again drive said shaft and at the same time draw upon the rod *j* to raise the outer end of the horizontal portion of the lever *m*, which is again projected into the path of the succeeding stop-pin *k* on the wheel B″ by the continued rotation of the cam-wheel I, which causes the roller *o″* upon the end of the lever *p* to ride out of its depression, thereby forcing said lever rearwardly and carrying with it the lever *m*, when another section of the longitudinal wires is paid out and the

reel again stopped and the succeeding cross-wire attached to the longitudinal wires in the manner before described.

When the clutch mechanism is operated to arrest the movement of the reel, the friction-shoes (not shown) are not entirely removed from contact with the inner arc of the wheel H, so that there is always present sufficient frictional contact between said shoes and wheel to apply some stress upon the shaft G'', whereby the reel is held against backward rotation and the longitudinal wires prevented from springing back therefrom.

To provide for increasing the diameter of the feed-wheels around which the wire passes, said wheels are split through their rim at one point, as shown in Figs. 5 and 6, and provided with diametrically-extending lugs J, which stand opposed on either side of the division through said rim. The adjacent faces of said lugs are contiguous, and between them is formed a tapered socket *t*, which is threaded and adapted to receive the conical screw *u*, which when screwed into said socket tends to spread the rim apart at the point of division, thereby slightly increasing its diameter to compensate for any wear which may have been caused by the action of the wire thereon. By this means the diameter of the feed-wheels may be made to exactly correspond, so as to obviate any possible variation in the lengths of the longitudinal wires which are fed therefrom. The divided portion of the rim is firmly held by means of the bolts *v*, passing through the lugs J.

From the drawings and foregoing description it will now be understood that by means of this improved machine absolute uniformity in the length of the longitudinal wires of the fabric is secured and a perfect spacing of the cross-wires effected.

Having thus fully set forth my invention, what is claimed is—

1. In a machine for forming wire fabric, the combination of the series of opposed feed-wheels arranged in adjacent pairs and around which pairs the longitudinal wires are adapted to pass, means connecting the opposed series of feed-wheels to cause them to travel in unison, a reel upon which the longitudinal wires are wound and which serves to draw said wires through the feed-wheels, means for imparting an intermittent movement to said reel, and means for regulating the movement of the feed-wheels to determine the length of wire fed therefrom at each operation of the reel.

2. In a machine for the purpose set forth, the combination of the series of feed-wheels having channels in their peripheries, the sprocket-chains passing around a portion of the arc of said feed-wheels and held in contact therewith, said chains being adapted to confine within the channels of said wheels the wire strands which pass around the peripheries thereof, and means for drawing upon said strands so as to cause them to pay off of said feed-wheels.

3. In a machine for the purpose set forth, the combination of the opposed series of feed-wheels around which the wire strands are adapted to pass, the reel upon which said wires are adapted to be wound, means for driving the shafts of said series of wheels in unison, pins projecting from a disk on one of said shafts, a movable lever extending into the path of said pins, a clutch mechanism for driving said reel, means connecting said clutch mechanism with said lever, and means for withdrawing said lever from the path of said pins.

4. In a machine for the purpose set forth, the combination of the grooved feed-wheels around which the wire is adapted to pass, wheels upon opposite sides of said feed-wheels adjacent thereto, chains passing around said oppositely-disposed wheels and around a portion of the arc of said feed-wheels, spring-actuated idle-wheels around which said chains also pass whereby tension is applied to cause said chains to lie closely to the peripheries of the feed-wheels.

5. In a machine for the purpose set forth, the combination of the grooved feed-wheels around which the wire is adapted to pass, said wheels having a divided rim, projecting lugs on each side of the division of said rim, a tapering threaded socket between the contiguous faces of said lugs, and a conical screw adapted to screw into said socket.

In testimony whereof I sign this specification in the presence of two witnesses.

GEORGE L. HOXIE.

Witnesses:
WILLIAM H. SHEARSON,
RICHARD B. ROBBINS.