

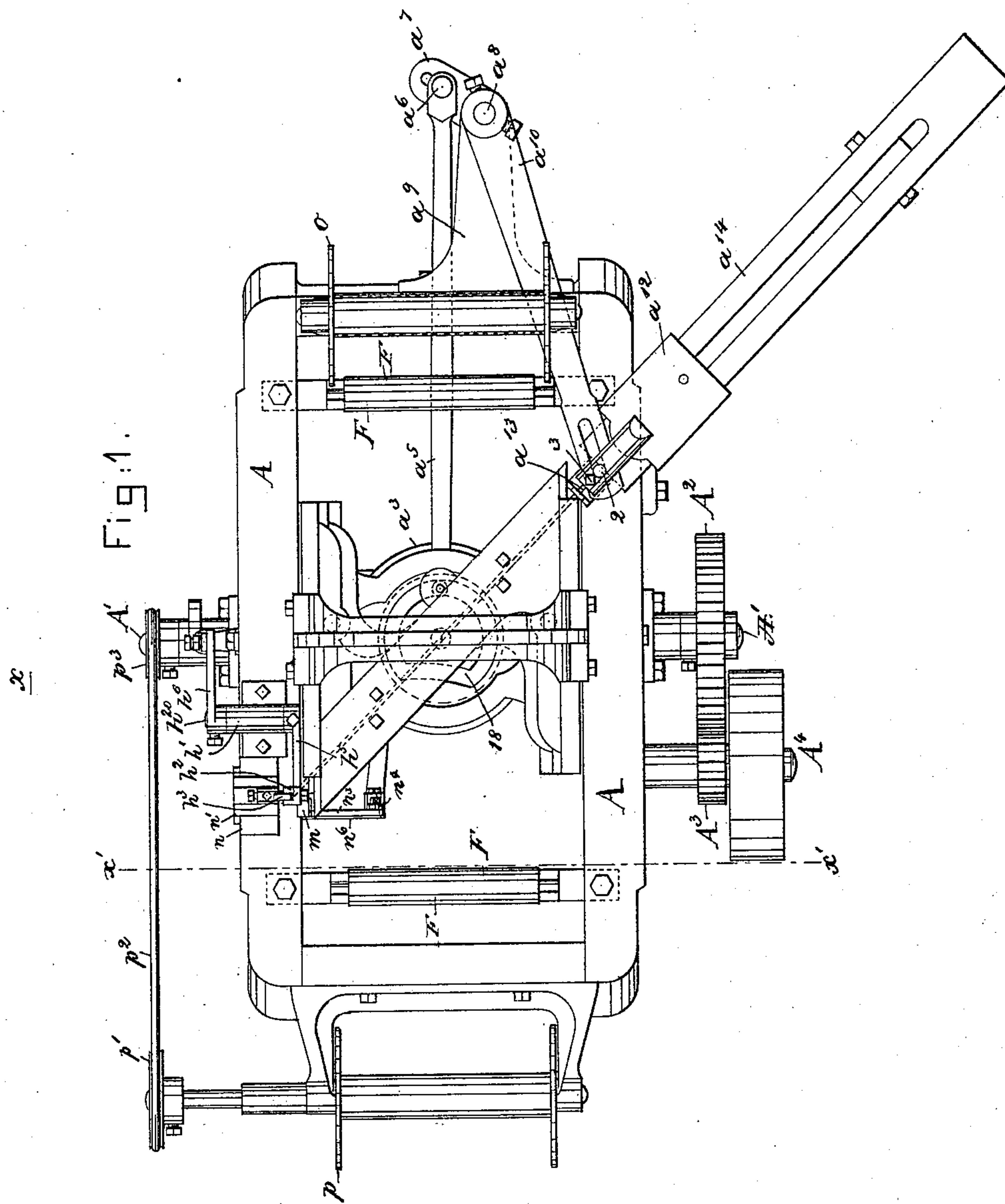
(No Model.)

4 Sheets—Sheet 1.

F. F. PARKER.
MACHINE FOR WEAVING CANE WORK.

No. 435,947.

Patented Sept. 9, 1890.



Witnesses

Fred. Schenck
James L. Emery

Inventor.

Frank F. Parker,
by Crosby & Gregory Attys.

(No Model.)

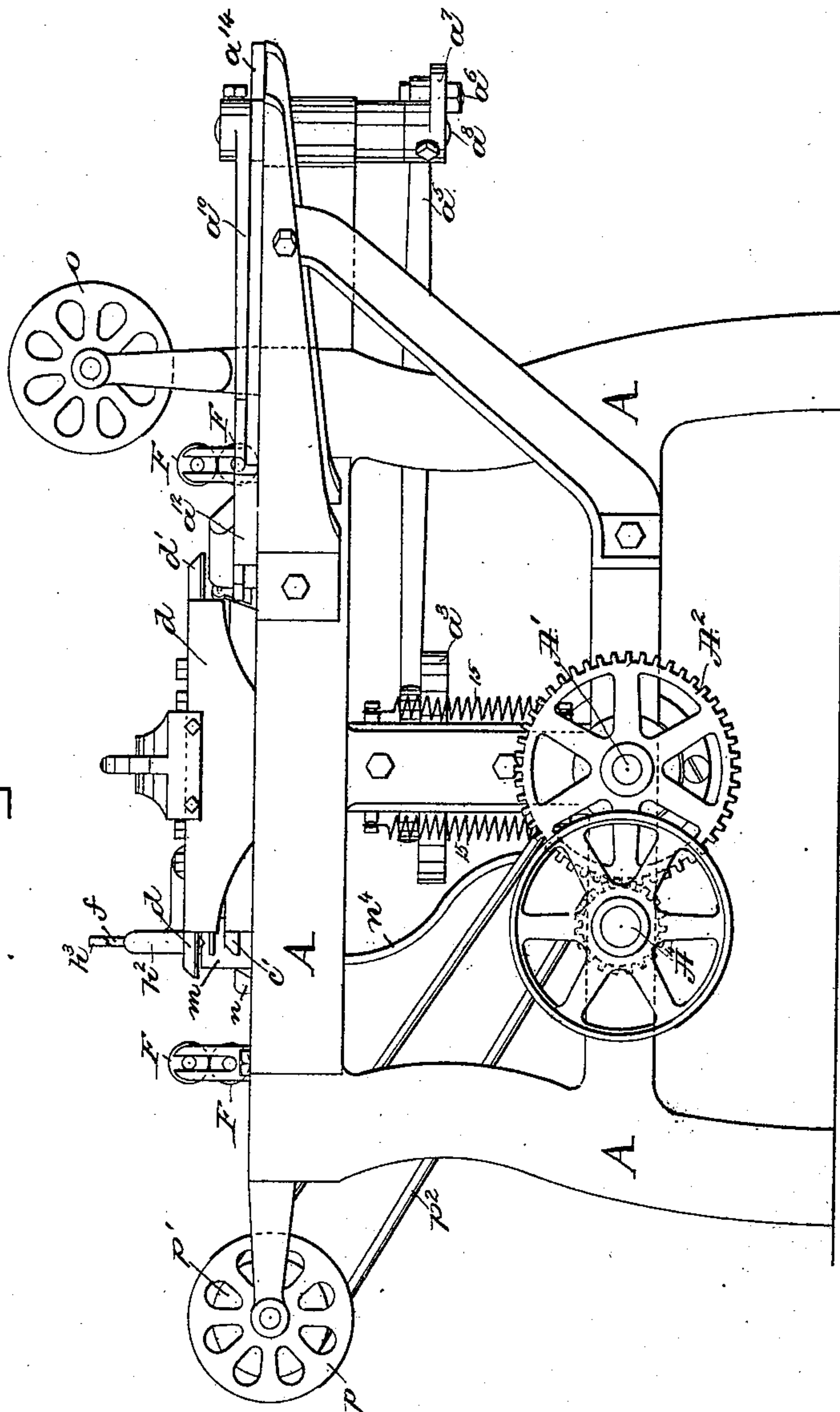
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Fig. 2.



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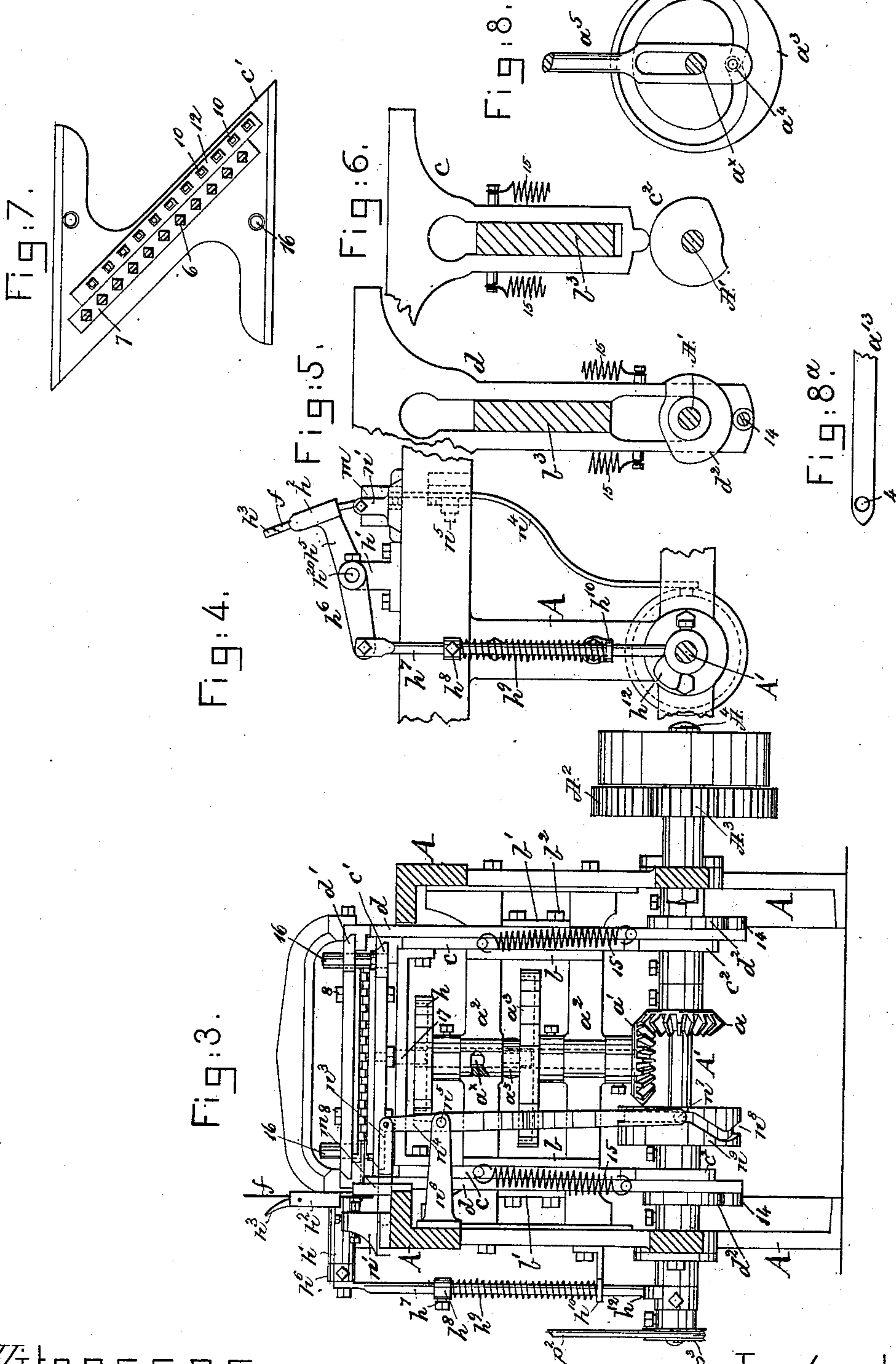
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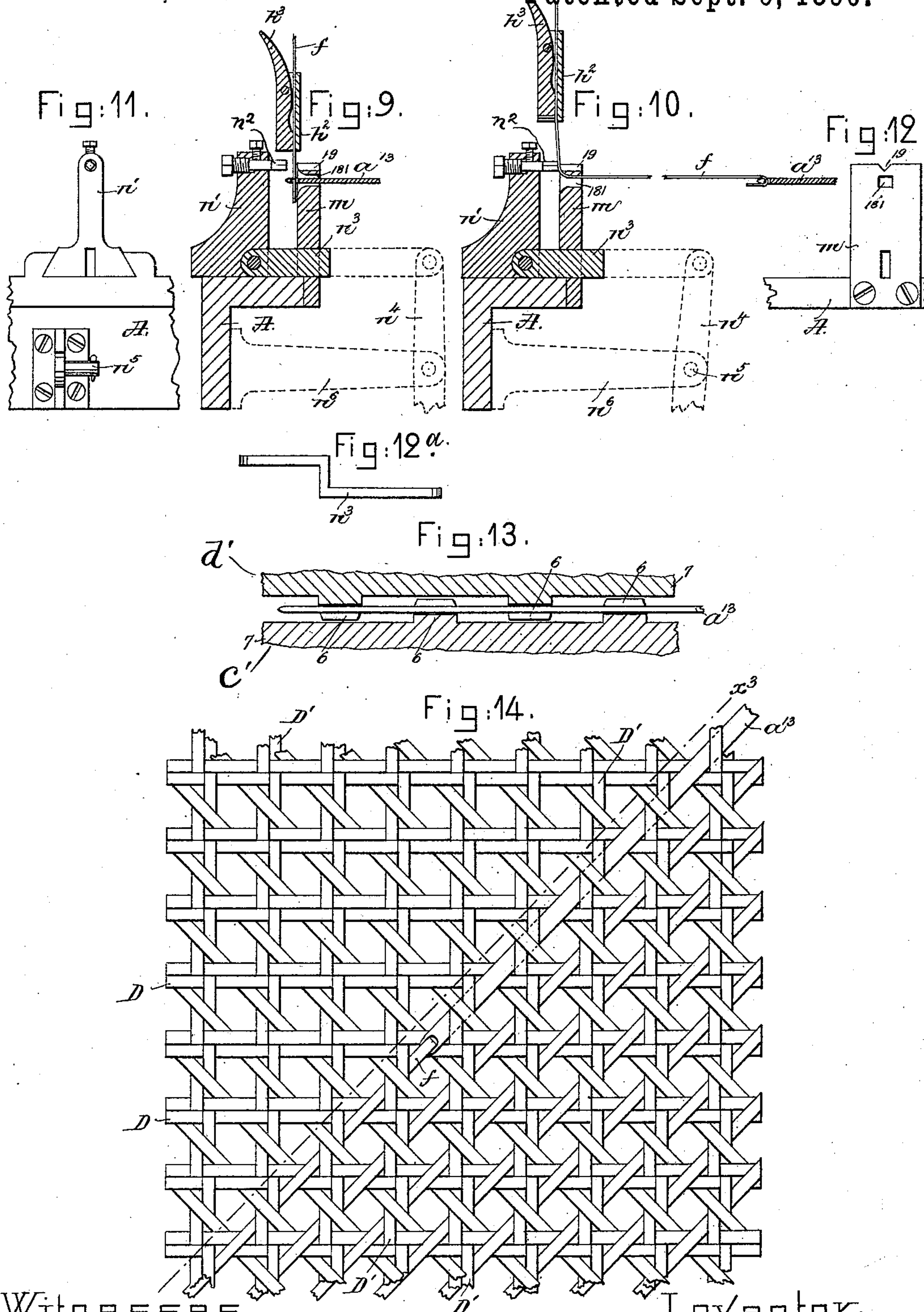
Witnesses.
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UNITED STATES PATENT OFFICE.

FRANK F. PARKER, OF GARDNER, MASSACHUSETTS.

MACHINE FOR WEAVING CANE-WORK.

SPECIFICATION forming part of Letters Patent No. 435,947, dated September 9, 1890.

Application filed March 2, 1889. Serial No. 301,780. (No model.)

To all whom it may concern:

Be it known that I, FRANK F. PARKER, of Gardner, county of Worcester, State of Massachusetts, have invented an Improvement in
5 Machines for Weaving Cane-Work, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

10 In the production of cane-work fabric for chair-seats and other purposes the cane fabric, after its longitudinal or warp strands have been interwoven with the transverse or weft strands, is provided, by a hand operation, with
15 a series of diagonal strands, which are passed over and under the warp and weft strands, thus partially filling in the rectangular spaces or checks between the warp and weft strands.

My invention has for its object the production of a novel mechanism for introducing
20 these diagonal strands into cane fabric.

In my invention the cane fabric, while clamped between clamps or jaws, is subjected to the action of a series of projections both
25 above and below the fabric, which projections, by acting upon the warp and weft strands, push some of the said strands up and other of the said strands down alternately, thus forming, as it were, an unobstructed channel
30 diagonally across the fabric for the introduction of a cane, carried, preferably, by a carrier, (herein shown as a needle having a slot or eye, into which the end of the strand to be
35 is threaded;) but I desire it to be understood that instead of the particular carrier herein shown I might employ any other usual or well-known carrier—such, for instance, as
40 commonly used in looms for weaving hair-cloth. The carrier or needle having been thrust diagonally through or across in the channel referred to, which channel is diagonal to the length of both the warp and the
45 weft threads, the strand to be inserted is presented to the carrier, so that as the carrier is retracted the strand is drawn into the fabric, the strand being cut off just before or as the carrier completes its return-stroke with the
50 strand. The strand having been inserted is moved forward, taking with it the fabric a distance equal to one row of checks, and then the clamp is opened, the upper and lower

members thereof are separated to disengage the fabric, and the clamp is moved backwardly and again closed upon and so as to
55 again clamp the fabric and form a channel therein for the strand. The feed-stroke of the clamp is for a greater or less distance, that depending upon the size of the check. As herein represented, the strand is fed into
60 the carrier automatically by a threader (shown as a jaw) having a dog to act upon the strand and insert the point thereof into the hole or eye in the carrier or needle, or to present the
65 strand to the carrier to be engaged by it, the strand being taken by the carrier from the threader; but this strand might be presented to the carrier by hand, although not so expeditiously and economically. In practice the
70 strand will be cut off next the threader by a cutter just before the strand is fully drawn in. The cutter will be so actuated as to hold the strand just before the carrier completes
its backward stroke, so as to enable the carrier to discharge the end of the strand, and
75 thereafter the cutter acts to sever the strand, the shape of the cutter being such as to point the strand.

I have herein shown my invention as embodied in an automatically-operating machine, in which the fabric is fed during the
80 reciprocation in one direction of the clamp described.

I do not desire to limit my invention to the exact shape and form of clamp so long as
85 the clamp operates as will be herein described.

My invention consists, essentially, in the combination, with a reciprocating separable clamp to clamp the cane fabric and form a
90 diagonal channel in the same, and means to reciprocate the clamp, of a carrier to insert a strand into the said channel, and means, as described, to separate the clamp during its
reciprocation in one direction and to close it in its movement in the opposite direction,
95 substantially as will be described; also, in the combination, with a clamp to clamp the cane fabric and form a diagonal channel, of a carrier to insert a strand in the said passage, and a threader to thread the said carrier;
100 also, in the combination, with a clamp to clamp a cane fabric and form a diagonal passage therein, and a carrier to take a strand through the said passage, of a cutting device

to sever the said strand to the proper length, substantially as will be described.

Figure 1 is a top or plan view of a machine embodying my invention, the operator in practice standing at the point x . Fig. 2 is a rear side elevation of the machine shown in Fig. 1. Fig. 3 is a section in the line x' , Fig. 1. Fig. 4 is a detail taken from the front of the machine, chiefly to show the threading device and the cam for operating it, the threader in this figure being shown as lifted. Figs. 5 and 6 are details of the frames in which the clamps, to be described, slide, the said figures showing parts of the means for reciprocating the said frames. Fig. 7 is a top or plan view of the lowermost clamp. Fig. 8 is a detail of the cam employed for actuating the lever employed in the present instance to reciprocate the carrier. Fig. 8^a is a much enlarged view of the front end of the carrier. Fig. 9 is a sectional detail showing the carrier in position to receive the strand from the threader with the cutting mechanism retracted. Fig. 10 is a like view, but with the threader elevated and the cutter partially thrown forward, it being shown in position to hold the strand while the carrier leaves it; Fig. 11, an inner side view of the slide carrying the cutter with the cutter attached. Fig. 12 is a detail showing the acting face of the throat through which the carrier works and against which the cutter works; Fig. 12^a, a top view of the link. Fig. 13 is a much enlarged detail showing the projections and spaces of the clamps with a strand therein; and Fig. 14 represents a detail showing a piece of cane fabric, a portion thereof to the left of the dotted line x^3 showing the diagonal strand inserted in but one direction, and yet another part with the diagonal strand in both directions, the said figure also showing the carrier as being withdrawn and as taking with it a strand.

The frame-work A is and may be of suitable shape to sustain the working parts. This frame-work contains suitable bearings for the cam-shaft A', having at one end a toothed gear A², which is engaged by a pinion A³, fast on a power-shaft A⁴, having usual or suitable driving-pulleys to be driven by power. The cam-shaft A' has fast upon it a beveled gear a , which engages a beveled gear a' , fast on a vertical shaft a^x , having its bearings in cross-bars $a^2 a^3$, the said shaft between the said cross-bars, as herein shown, having fast upon it a cam, as a^3 , having, as herein shown, a groove, the shape of which is best shown in Fig. 8 of the drawings, the said groove receiving a roller or other stud, as a^4 , at the end of a connecting-rod a^5 , which at its opposite end (see Fig. 1) embraces a stud a^6 , adjustably secured to an arm a^7 of a rock-shaft a^8 erected in a stand a^9 at one end of the machine, the said rock-shaft, as herein shown, having secured to its upper end an arm a^{10} , represented as slotted at its outer end to receive a pin or projection, as 2, extended

outwardly from the under side of a slide a^{12} , to which is secured by a screw 3, or in other suitable manner, the carrier a^{13} for the strand. The slide a^{12} is adapted to be reciprocated back and forth on the diagonal raceway a^{14} , supported in suitable manner. The cam a^3 , the link a^5 , rock-shaft a^8 , arm a^{10} , and slide a^{12} constitute one form of carrier-actuating mechanism; but I do not desire to limit my invention to the means for actuating the carrier of the precise form of mechanism herein shown.

From the description it will be understood that the carrier moves diagonally across the frame-work of the machine. The front end of the carrier, as best shown in Fig. 8^a, is herein represented as having an open eye, as 4. The cross-bars a^2 have vertical flanges b , which are faced to constitute one side of guideways for the shanks of the slides c and d , the other side of the guideways being composed of plates b' attached by suitable bolts, as b^2 , to connecting-webs b^3 , forming parts of the said cross-bars, the said shanks straddling the said webs, as shown in section in Figs. 5 and 6, there being two slides at each side the machine. The slide-frames $c d$ are grooved longitudinally at their inner sides, as shown best in Fig. 3, to receive loosely like-shaped ends, respectively, of the clamp-bars $c' d'$, the two constituting what is hereinafter termed the "clamp." Each clamp-bar has upon its acting face a series of projections 6, having grooves, all the said grooves being in line, while between the said projections are spaces. As herein shown, the said projections are attached to bars 7, secured to the clamp-bars by means of like set-screws 8, such construction being desirable, in order that the said bars 7 may be readily detached from the clamp-bars for the substitution of other bars having projections applied thereto at the proper distance apart to accommodate the size of the check. The grooves in the projections are to permit the passage of the carrier diagonally across and through the fabric, and to also enable the strand to be drawn back as the carrier is retracted.

In practice the projections of the clamp-bars c' and d' are so arranged that the projections on clamp-bar d' , when the two clamp-bars are brought together upon the fabric, enter the spaces between the projections on the clamp-bar c' —as, for instance, referring to Fig. 14, it will be supposed that the projections on the clamp-bar d' are acting on the warp-strands D, arranged in pairs to bend them down, while the projections on the clamp-bar c' extended upwardly act upon the under sides of the weft-strands D', bending them upwardly—thus leaving an unobstructed diagonal channel in the fabric, between which the carrier may be inserted to receive in its eye the end of a strand, as f , to be taken by the carrier through the fabric. Each clamp-bar, as herein shown, is preferably provided with a like series of points, as 10, preferably carried by a bar 12, which is attached to each clamp-bar

by a suitable screw, the said points entering the spaces left in the fabric between the warp and weft strands, thus aiding in keeping the fabric in proper position or to register it so that the projections 6 of the clamp-bars may come correctly upon the warp and weft strands, respectively, in pushing them up and down to form the diagonal channel or passage in the fabric. The slide *c* rests upon and is actuated by the cam *c*², fast upon the cam-shaft A'. The lower end of each slide *d* is slotted to embrace the main shaft, and each slide *d* has a roller or other stud, as 14, which is acted upon by a cam, as *d*², also carried by the cam-shaft. Each of the slides *c* and *d* has a pin, as shown best in Figs. 3, 5, and 6, the pins of adjacent slides receiving upon them the opposite ends of a strong spiral or other spring, as 15, the said springs acting on pins of adjacent slides so as to act normally to move the slides in opposite directions to open the clamp-bars and free the fabric between them, as when the clamp is to be moved backwardly after having been moved to feed the material; but these springs are not permitted to act except at certain times, that depending upon the positions of the cams *c*² *d*². The lowermost clamp-bar *c'* is herein represented as provided at each side with a stud or pin 16, which is extended loosely up through a hole in the clamp-bar *d'*, the said pin causing the two clamp-bars to be moved longitudinally in unison. The lowermost clamp-bar *c'* has depending from it (see Fig. 3) a stud 17, which enters a cam-groove 18 (see Fig. 1) in a cam *h*, fast on the upright shaft *a*^x, the said cam in the rotation of the said shaft causing the clamp-bars to be reciprocated at the proper time, and during their reciprocation in one direction the clamp-bars are held together by the slides carrying them, and when being reciprocated in the other direction, or backwardly, the clamp-bars are opened by the springs 15 referred to.

The upper part of the machine has a suitable bearing, as *h'*, in which is placed the threading device to be described, the said threading device, as herein represented, consisting, essentially, of a movable jaw *h*², and a dog *h*³ pivoted thereon, the said movable jaw, as herein represented, forming part of an arm *h*⁵, secured to a rock-shaft *h*²⁰, another arm, as *h*⁶, extended from the said rock-shaft, having attached to it a leg *h*⁷, provided with a collar *h*⁸, to which is connected a spiral spring which surrounds the said leg, the lower end of the spring—it being a contractile spring—being attached to an ear *h*¹⁰ secured to the frame-work, the said spring normally keeping the threader in elevated position, the threader being thrown down at the proper times to place the end of the cane into the eye 4 of the carrier by the action against the lower end of the leg of the cam *h*¹², (shown best in Fig. 4,) fast on the cam-shaft A'.

On the frame-work, just below the threader, I have erected a throat *m*, which, as repre-

sented in Fig 12, has a hole 181 for the passage of the carrier *a*¹³, the upper end of the throat being notched, as at 19, to constitute the stationary member of a cutter. On the frame-work opposite the said throat I have made a suitable guideway, as *n*, in which is placed the block *n'*, to which is secured by a suitable screw a cutter *n*². This block *n'* has connected to it a link *n*³, which is joined to the upper end of a lever *n*⁴, pivoted at *n*⁵ on a suitable stand, as *n*⁶, the said lever, which preferably is offset, having a suitable roller or other stud, as *n*⁷, which enters the groove *n*⁸ of a cam-hub *n*⁹, fast on the shaft A'.

The slide *n'*, the link *n*³, lever *n*⁴, and cam *n*⁹ constitute one form of cutter-actuating mechanism; but I do not desire to limit my invention to this precise form of cutter-actuating mechanism.

The frame-work of the machine, as herein shown, is provided with a delivery-beam, as *o*, and a take-up-beam, as *p*, and between the said beams, at each side of the clamp referred to, I have provided the machine with a pair of pressure-rolls, as F. The beam *o*, made as a spool or to resemble any usual warp-beam, receives upon it the cane fabric woven with warp and weft in usual manner, the said fabric being led between one pair of pressure-rolls, then between the clamp-bars and between the next pair of pressure-rolls, and through them to the beam *p*, which may be of any usual shape common to any take-up-beam, which receives upon it the material after the same is provided with the diagonal strands *f*.

The journal of the take-up beam *p* has fast upon it a pulley *p'*, over which is extended a belt *p*², in turn surrounding a pulley *p*³ on the end of the cam-shaft, the said belt driving the said take-up beam frictionally and in such manner as to enable it to take up the slack in the fabric left after feeding the same positively forward by the clamp. The fabric having been inserted between the clamp-bars, as described, and the clamp-bars being in their farthest backward position or nearest the beam *o*, are brought together upon the fabric, causing the projections 6 of the clamp upon the warp and weft strands alternately to raise and lower them and form the diagonal passage through the fabric. In this condition the carrier is inserted through the said diagonal passage, and, arriving at the opposite edge of the fabric, the threader, if it be used, will be actuated to insert the pointed end of the strand into the eye 4 of the carrier, the threader during such operation moving from its position shown in Fig. 10 down to the position shown in Fig. 9. The cane having been inserted in the eye of the carrier, the latter is reciprocated, taking with it the end of the cane, drawing it along through the threader, which remains down and open until the carrier nearly completes its back-stroke, at which time the threader is permitted to rise into the position shown in Fig. 10,

and the cutting mechanism is started to move the cutter forward against the strand, the cutter, owing to the shape of the groove in the cam, first impinging against the strand and holding it while the carrier completes its backward stroke sufficiently to pull the carrier off from the end of the strand, which done, the motion of the cutter is continued far enough to cut off the strand and leave it with a preferably central point, the pointed end of the strand being left projecting below the threader. After this the clamp is moved forward by the cam *h*, and the projections 10 yet being in the spaces of the checks and the projections 6 yet holding the strands, the fabric is moved forward. The clamp having been moved toward the beam *p* for a distance equal to the one row of checks, the springs 15 are permitted to operate to open the clamp-bars, and immediately thereafter the clamp-bars are moved backward to their position nearest the beam *o*, when they are again closed, as before, on the fabric.

It will be obvious, with the fabric the same side up, that the machine described could insert the diagonal strand in but one direction, so that to put in the opposite diagonal strand it is necessary either to turn the fabric the other side up and feed it through the machine, as described, or else carry it to a second machine in which the parts are made opposite-handed.

I claim—

1. The combination, with a reciprocating separable clamp to clamp the cane fabric and form a diagonal channel in the same and means to reciprocate the clamp, of a carrier to insert a strand into the said channel, and means, substantially as described, to separate the clamp during its reciprocation in one di-

rection and to close it in its movement in the opposite direction, substantially as described. 40

2. The combination, with a clamp to clamp the cane fabric and form a diagonal channel therein, and a carrier to insert a strand in the said passage, of a threader, to operate substantially as described. 45

3. The combination, with a reciprocating clamp to clamp a cane fabric and form a diagonal passage therein, and a carrier to take a strand through the said passage, of a cutting device to sever the said strand to the proper length, and means, substantially as described, to reciprocate the clamp thereafter to feed the fabric during its movement in one direction, substantially as described. 50 55

4. The clamp-bars having projections to act upon the warp and weft of the fabric and form a diagonal passage, combined with points to enter the spaces of the fabric parallel to the spaces which are being provided with diagonal strands, the said points aiding in positioning the fabric, substantially as described. 60

5. The clamp-bars to hold the fabric, as described, and the carrier, combined with the cutter, and means, substantially as described, to move it to clamp the strand at about the time the carrier completes its return-stroke to thereby withdraw the carrier from the strand and thereafter to cut the strand, substantially as described. 65 70

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

FRANK F. PARKER.

Witnesses:

GEO. W. GREGORY,
B. DEWAR.