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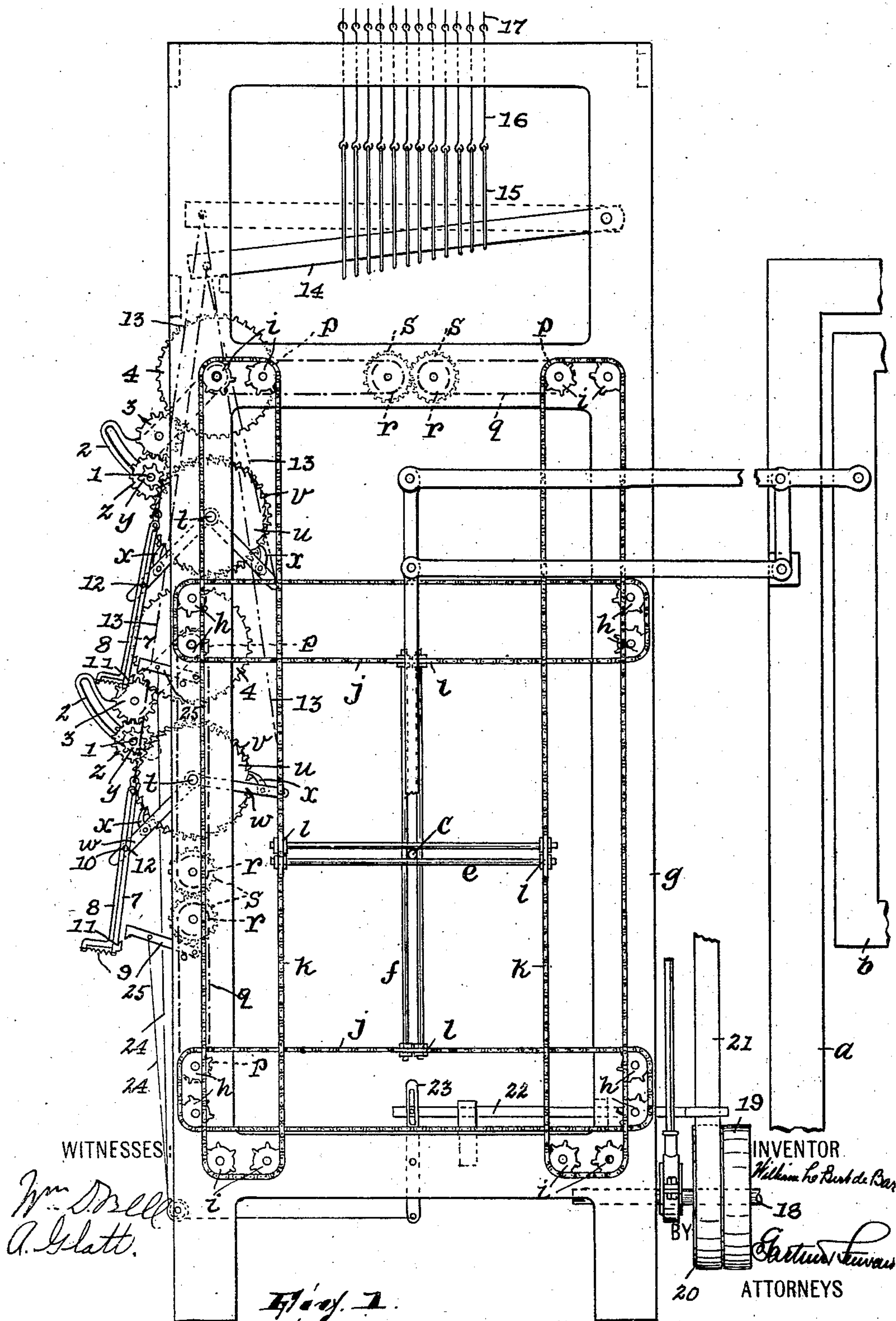
PATENTED MAY 28, 1907.

W. LE BERT DE BAR.

FABRIC FRAME MOVING MECHANISM FOR EMBROIDERY MACHINES.

APPLICATION FILED JULY 10, 1906.

3 SHEETS—SHEET 1.



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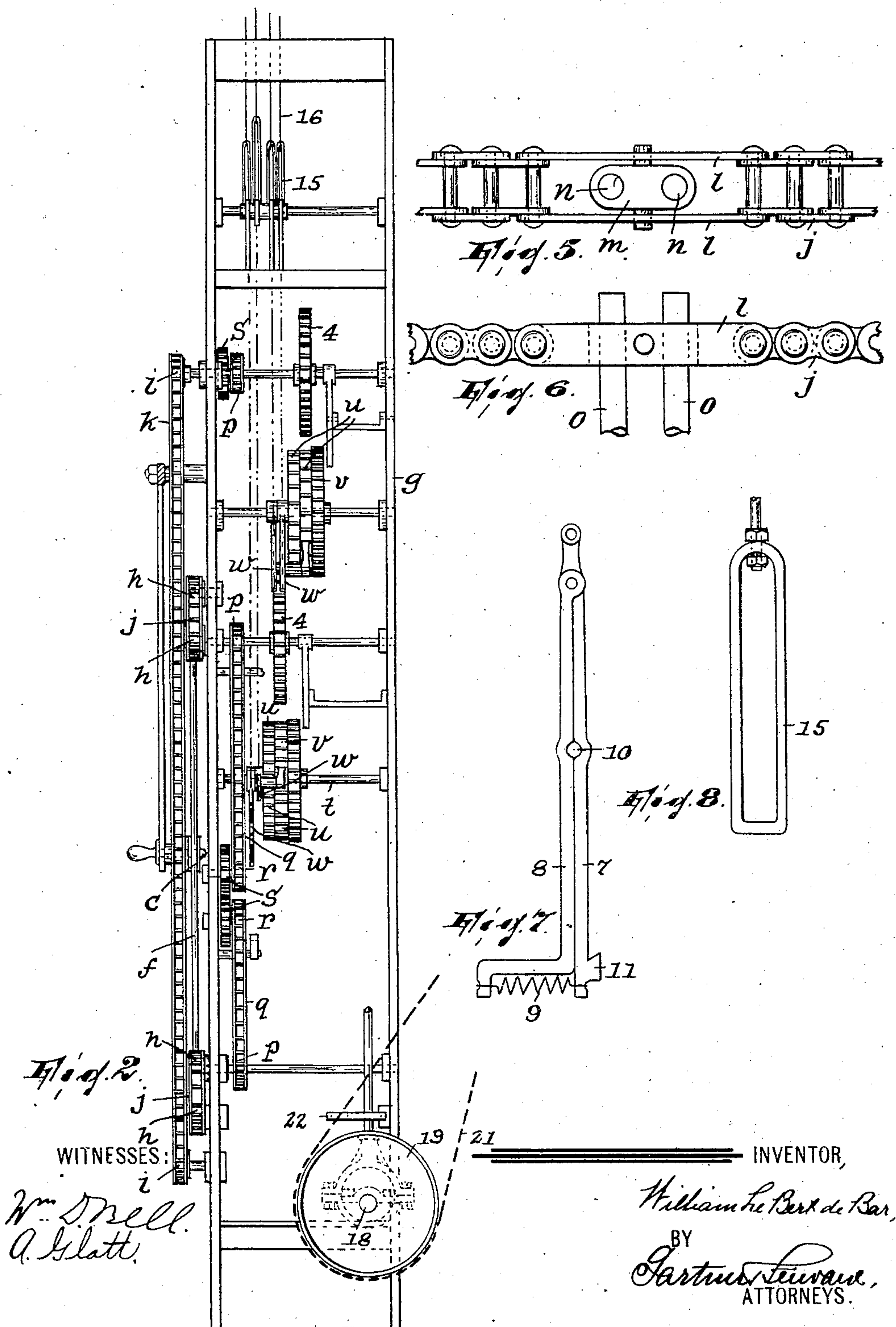
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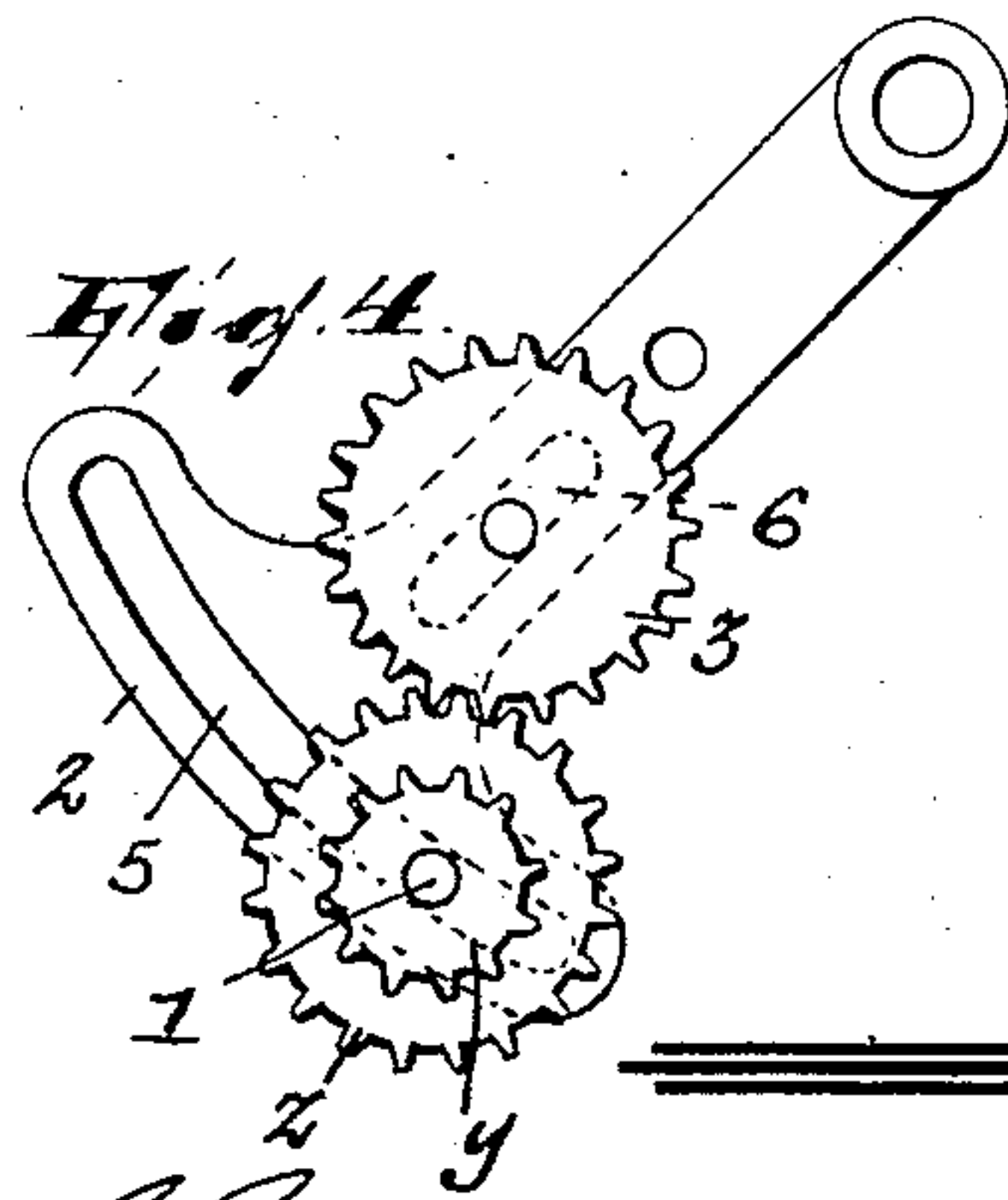
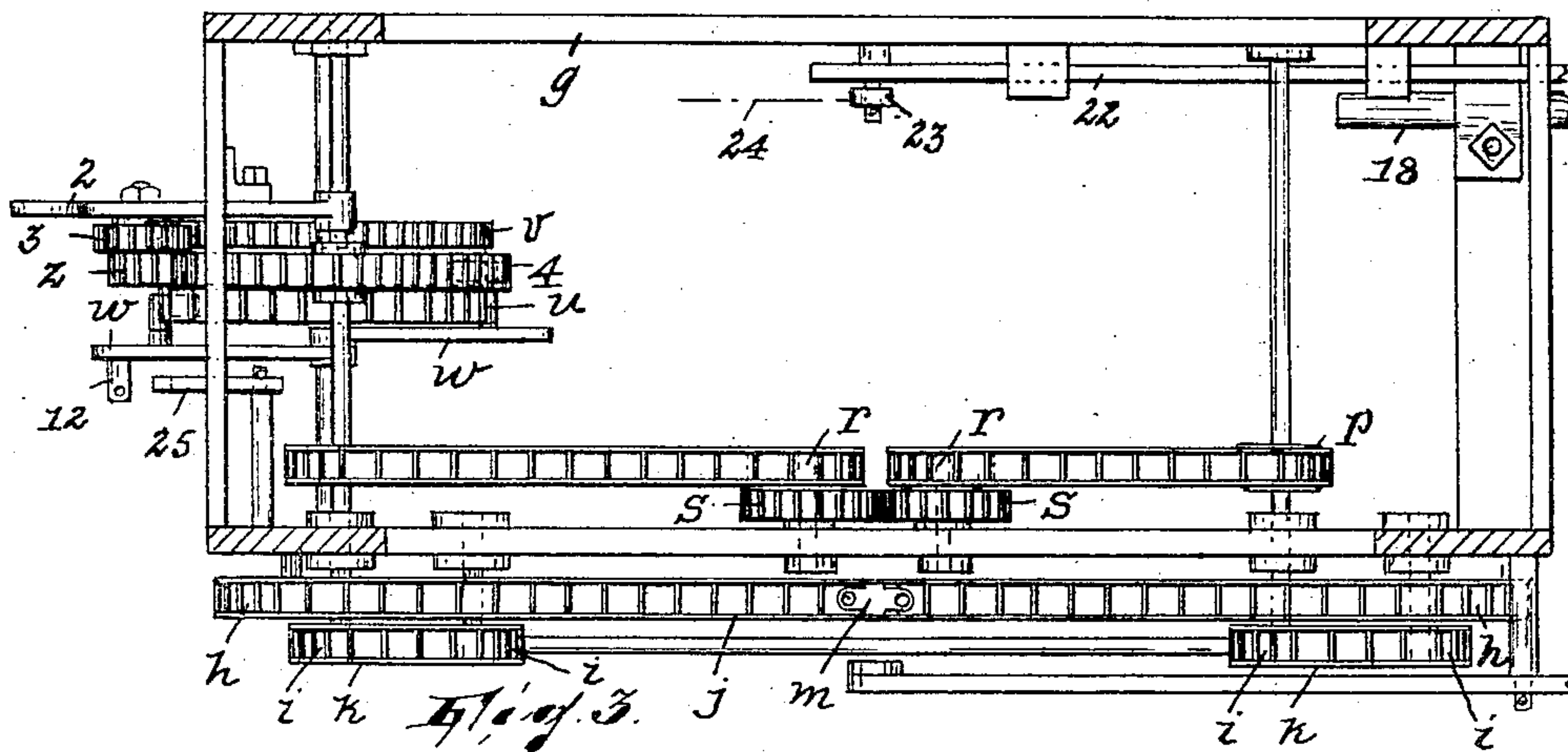
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3 SHEETS—SHEET 3.



WITNESSES:

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UNITED STATES PATENT OFFICE.

WILLIAM LE BERT DE BAR, OF UNION, NEW JERSEY.

FABRIC-FRAME-MOVING MECHANISM FOR EMBROIDERY-MACHINES.

No. 855,187.

Specification of Letters Patent.

Patented May 28, 1907.

Application filed July 10, 1906. Serial No. 325,476.

To all whom it may concern:

Be it known that I, WILLIAM LE BERT DE BAR, a citizen of the United States, residing in the town of Union, county of Hudson, and State of New Jersey, have invented a certain new and useful Improvement in a Fabric-Frame-Moving Mechanism for Embroidery-Machines; and I do hereby 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 letters of reference marked thereon, which form a part of this specification.

This invention relates to embroidery machines, and it has reference particularly to automatic means for imparting the required movements to the fabric-frame of such machines.

My invention contemplates the employment of guides arranged to cross each other, to move in courses at an angle to each other and in common to thereby shift in various directions, but in a single plane, a part working in said guides and suitably connected with and adapted to turn to move the fabric-frame, according to changes effected in the relative positions of said guides; and it further contemplates providing, in combination with said guides and the part controlled thereby, a simple, practical and efficient means for transmitting motion to the guides from a jacquard or other like mechanism serving as the prime controller of said guides.

My invention will be found fully illustrated in the accompanying drawings, wherein,

Figure 1 is a view in front elevation illustrating my invention in connection with the fabric-frame of an embroidery machine, only a fragment of which is shown; Fig. 2 is a view in side elevation of the mechanism involved in the invention, looking from the embroidery machine; Fig. 3 is a horizontal sectional view taken just above certain endless chains which carry the guides; Fig. 4 is a detail view illustrating a part of certain gearing; Figs. 5 and 6 are, respectively, plan and side detail views of one of the chains; Fig. 7 is a detail illustrating one of certain divided pitmen; and, Fig. 8 is a detail view of one of certain stirrups.

In the drawing, *a* designates the main frame of an embroidery machine and *b* is the fabric-frame. The latter, as is well known, is adapted for movement in various directions

in a single plane; as is common, so in the present instance the fabric-frame is counter-balanced by suitable well-known devices (not shown) so that when moved to any given position by the controlling part it will maintain that position, as against the action of gravity, for instance, until again moved to a new position from said controlling part.

c designates the controlling part and *d* is a pantograph connected to the fabric-frame *b* on the one hand and to said part *c* on the other. Said part *c* may be in the form of a pin, and it is adapted to be moved in any direction and into any position in a plane of a given area, (whereby to effect corresponding movements in the fabric-frame *b*) by guides *e* and *f*, in each of which it is movable and which cross each other and are movable independently of each other in courses at an angle to each other. So much being stated, it will be understood that upon the movement of the guides *e* and *f* in courses at an angle to each other, the pin *c* will be caused to move about in the plane referred to; it will therefore be only necessary to describe herein the construction of said guides in the present instance and the means whereby motion is imparted to them.

g is a frame substantially rectangular in form which stands alongside the frame *a*, or in any other convenient position and in which are journaled two groups of sprocket wheels *h* and *i*, each group being divided into two sets arranged side by side and at the corners of a rectangle. Over each set of sprocket wheels *h* extends an endless sprocket chain *j*; correspondingly, over each set of sprocket wheels *i* extends an endless sprocket chain *k*; the arrangement is such that the two sprocket chains *j* are parallel to each other, as likewise the two sprocket chains *k*. Furthermore the sprocket chains *j* cross the sprocket chains *k*, so that the four chains form a rectangular space.

Each chain *j* and *k* has two long links *l* in which is mounted a block *m* having pairs of holes *n*. Each block *m* and the corresponding block pertaining thereto in the same chain *j* (or *k*) receives in its holes *n* the ends of parallel bars *o*, which bars form the guides *f*.

In view of the foregoing, it will be apparent that by moving the chains *k* together up or down and the chains *j* together in either direction laterally the pin *c* can be made to take any course and assume any position de-

sired within the rectangular plane formed by the chains *j* and *k*.

Referring, now, to the means for moving the chains in the manner just stated, one sprocket wheel in each of the two sets *h* of sprocket wheels carries another sprocket wheel *p* over which extends a sprocket chain *q* which extends around another sprocket wheel *r* journaled in the frame *g* and carrying a pinion *s*, the two pinions *s* intermeshing with each other; similarly, one sprocket wheel in each of the two sets *i* of sprocket wheels carries another sprocket wheel *p* over which extends a sprocket chain *q* which extends around another sprocket wheel *r* journaled in the frame *g* and carrying a pinion *s*, the two pinions *s* intermeshing with each other. By this means, any motion imparted to either of the sprocket chains *j* or *k* will result in the same motion being imparted to the other sprocket chain *j* or *k*, so that whatever relative movements in a rectilineal direction each guide *e*, *f* will have, the angle of said guides remains constant, in the present instance, a right angle.

On each of two shafts *t* in the frame *g* are journaled two ratchet wheels *u* and a gear wheel *v*, the ratchet wheels having their teeth reversely cut; on each of said studs are also fulcrumed two levers *w* each carrying a pawl *x* engageable with the teeth of one of the ratchet wheels. By vibrating either lever *w* back and forth around its fulcrum, the gear *v* can be moved in either direction, according to which lever is vibrated, it being stated that the two ratchets and the gear are fixed together. One of the gears *v* is adapted to move the two sprocket chains *k* either up or down; the other gear *v* is adapted to move the other chains *j* laterally, to the right or left. For this purpose each gear *v* meshes with a pinion *y* fixed to a pinion *z*, the two being journaled on a stud 1 in a bracket 2 and the pinion *z* meshing with another pinion 3, journaled in bracket 2, and in turn meshing with a gear 4 which may be arranged to rotate with the sprocket wheel *p* and the sprocket wheel *h* (or *i*) appertaining thereto.

It may be desirable to change the pinions *y*, *z* and 3 for others of different sizes; hence the studs on which these pinions are mounted in the bracket are shown as arranged in slots 5 and 6 in which they are adjustable, the bracket itself being fulcrumed in the frame *g* on an axis coincident with that of the gear 4.

Referring now to Fig. 7, the divided pitman there shown comprises two members 7 and 8 pivoted together at their upper ends and normally held flat against each other by a spring 9. Between the contacting faces of these members is formed a bearing 10, and the member 7 is furthermore formed at its lower end with a toe 11.

One of the pitmen just described is mounted on one of the levers *w* in each pair, a pin

12 on said lever being received by the bearing 10 of the pitman. A flexible connection 13 extends from one of the levers *w* direct to one of four levers 14 fulcrumed in the frame *g*, while a corresponding flexible connection extends from the pitman on the other lever *w* to another lever 14. Each lever 14 extends through a series of stirrups 15 suspended by links 16 from the hooks 17 of a jacquard or similar machine (not shown). Since the hooks of the jacquard machine all have the same extent of movement vertically, the variety of movements which must be imparted to the levers *w* in order to produce a corresponding variety of extent or direction of movement in the pin *c* is derived through the levers 14; *i. e.*, although all the hooks have the same throw, the lever 14 corresponding to any one series of hooks will be moved more or less according as it is a stirrup 15 which is more or less distant from its fulcrum which actuates it.

The drive shaft for the embroidery machine is shown at 18; 19 and 20 are fast and loose pulleys thereon, and 21 the driving belt. 22 is the belt shifter, 23 a lever connected therewith and 24 flexible connections between said lever and other levers 25. Each of the latter levers projects close to and slightly above the horizontal plane of (though not directly over) the toe 11 of the pitman on the levers *w*. The purpose of this mechanism is the following: If by any mistake in the operation of the jacquard machine the two levers *w* indirectly controlling any one gear wheel *v* should be pulled upon at the same time, before its elevation can occur the pin 12 would force apart the members 7 and 8 of the pitman and slide down between the same, moving the member 7 toward the lever 25 and causing the toe to catch under said lever, raise the same and through it and the flexible connection 24 actuate lever 23 and the shifter 22 so as to shift the belt and stop the machine.

Operation: It being assumed that the cards or the like pattern device of the jacquard machine or its equivalent have been adapted to the reproduction in the embroidery machine of any given design, the levers 14 will be moved by the jacquard machine and their responding action will move the one or the other of the levers in each set of levers *w* more or less according to which stirrup it is through which said lever acquires its movement. The vibration of each lever *w* means a partial rotation of the ratchet wheel *u* controlled thereby and the gear *v* appertaining to said ratchet; and such partial rotation is transmitted through the gearing *y*, *z* and 3 to the gear 4 which acts in turn through the sprockets and chains to move one of the guides *e*, *f*, which movement is of course in a direction transverse to its length and so effects the displacement of the pin *c* in

the guide-way of the other guide. It will be apparent that, according to the direction which the fabric-frame is to take or the position which it is to assume at any time, the one or the other or both of the guides may be required to be moved in order to move pin c and consequently the fabric-frame.

It will be understood that the mechanism to which my invention is directed may be connected to the fabric-frame of the embroidery machine or disposed with reference to the latter otherwise than in the manner shown in the drawings, which is more or less merely for the purpose of illustration.

Having thus fully described my invention, what I claim and desire to secure by Letters Patent is:

The combination, with the part to be moved and the fabric-frame controlled therefrom, of crossed guides, said part being en-

gaged with and movable in each guide, carrying means for said guides movable each in a course transverse of its respective guide, and means for moving said carrying means consisting of a rotary toothed part, pawl carrying levers for rotating said toothed part, other levers, operative connecting means between each of said other levers and the respective first-named levers, and stirrups engaged with each of said other levers at different distances from its fulcrum, substantially as described.

In testimony, that I claim the foregoing, I have hereunto set my hand this 7th day of July, 1906.

WILLIAM LE BERT DE BAR.

Witnesses:

JOHN W. STEWARD,
I. D. STEWARD.