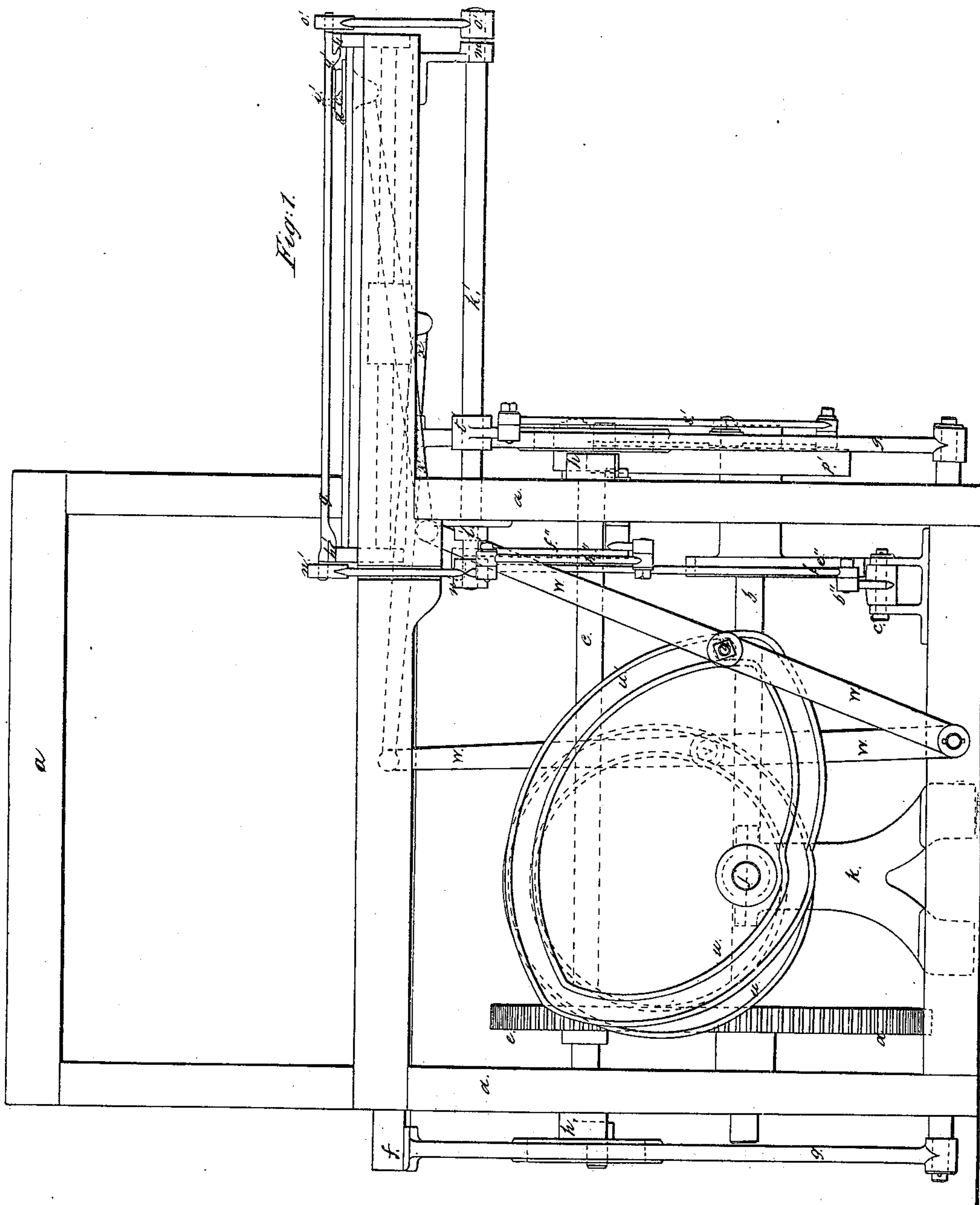


Sheet 1 of 4 Sheets.

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Weaving Pile Fabric.

N^o 13,936.

Patented Dec. 18, 1855.

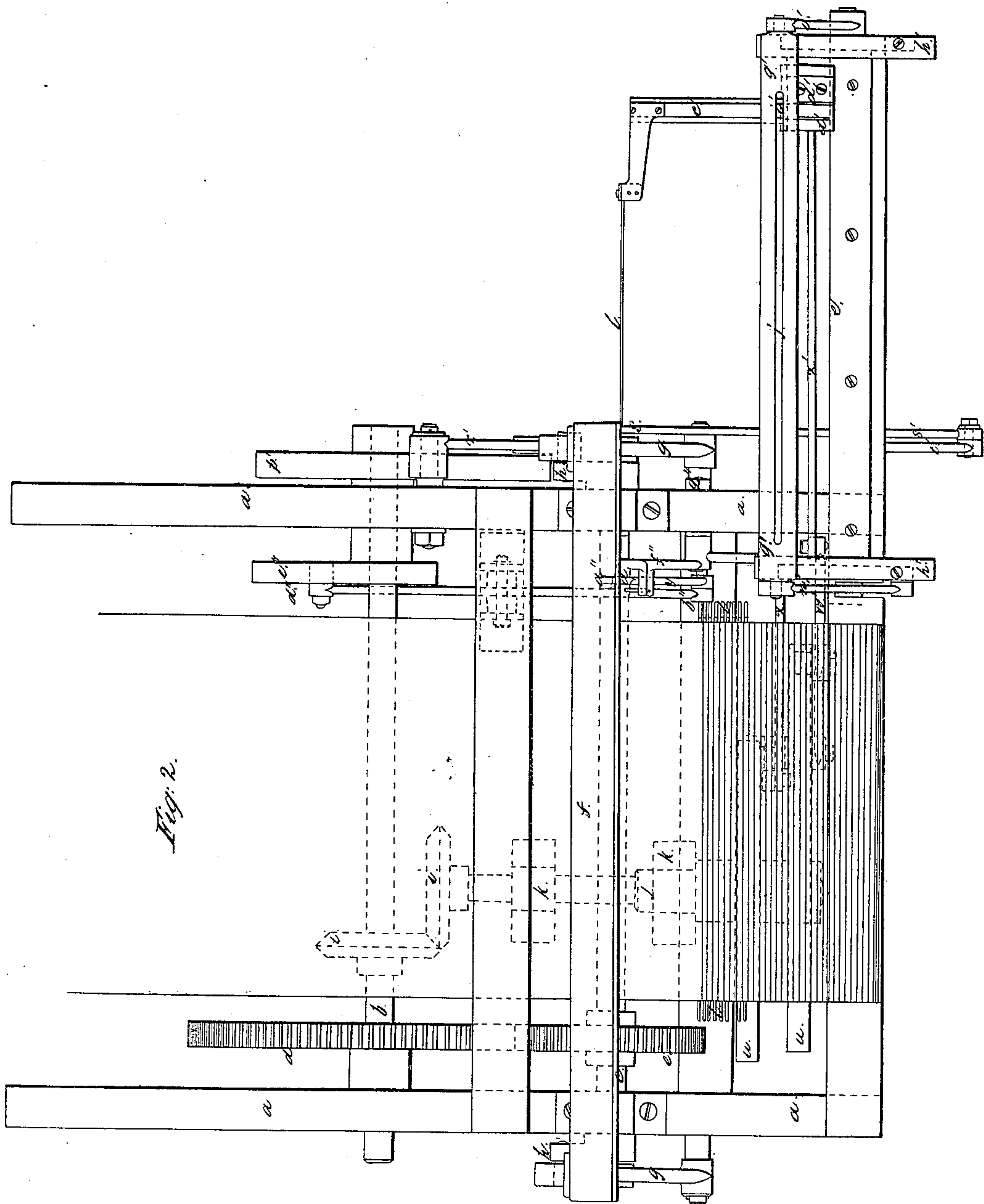


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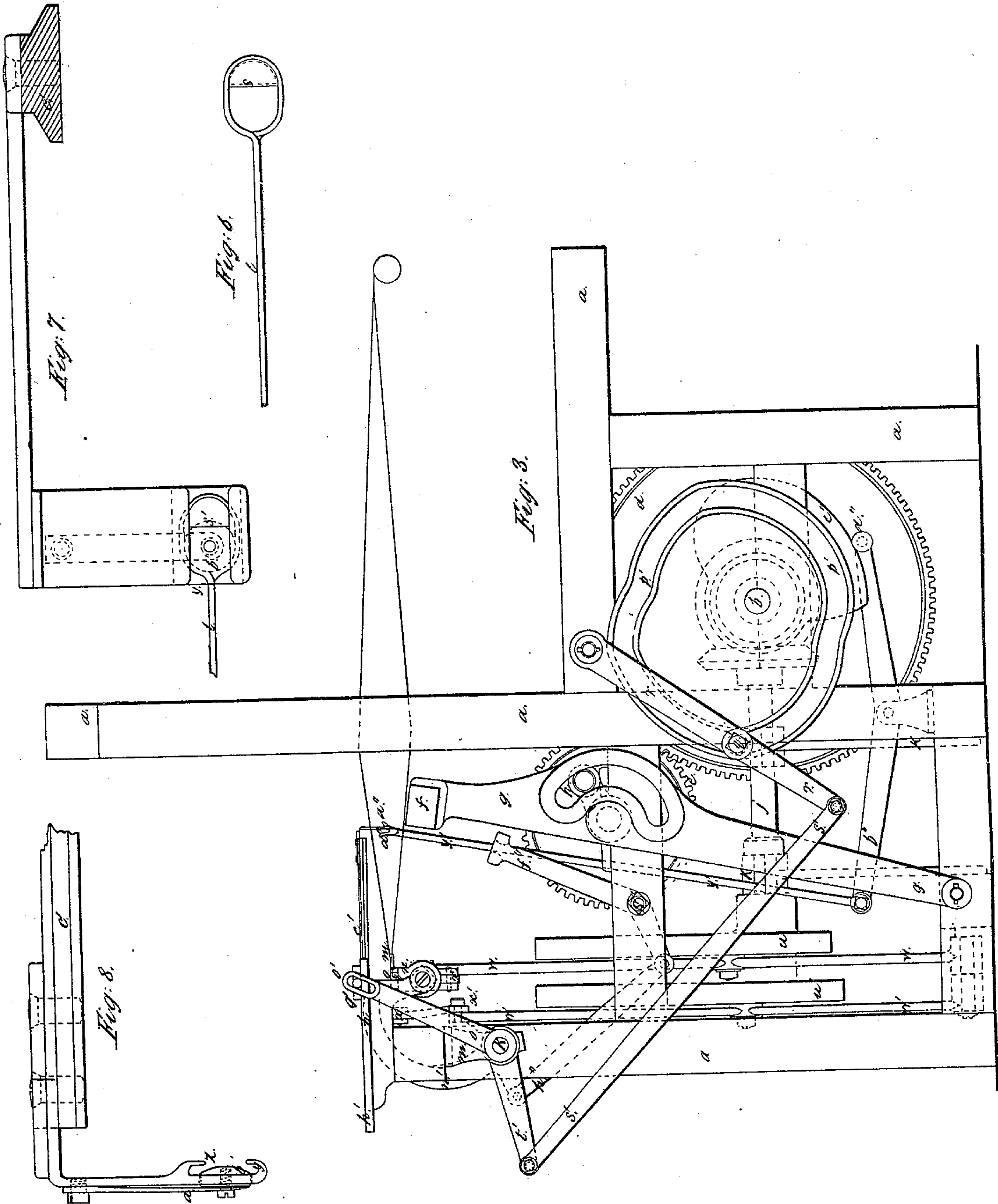
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UNITED STATES PATENT OFFICE.

E. B. BIGELOW, OF BOSTON, MASSACHUSETTS.

IMPROVEMENT IN LOOMS FOR WEAVING PILE FABRICS.

Specification forming part of Letters Patent No. 13,936, dated December 18, 1855.

To all whom it may concern:

Be it known that I, ERASTUS B. BIGELOW, of Boston, in the county of Suffolk and State of Massachusetts, have invented new and useful Improvements in Power-Looms for Weaving Pile or Terry Fabrics by Pile-Wires; 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—

Figure 1 is a front elevation, Fig. 2 a plan, Fig. 3 an end elevation, and Figs. 4, 5, 6, 7, and 8 are details.

The same letters indicate like parts in all the figures.

These improvements relate to the mode of operating the pile-wires in weaving pile or terry fabrics, and are improvements upon my Brussels carpet loom patented March 7, 1847.

One part of my present invention consists in the employment of a latch or hook constructed and operated, as herein to be specified, for successively drawing the pile-wires from under the pile of the cloth and delivering them to the apparatus, which completes their movement.

The other part of my invention consists in the mode of constructing and operating the apparatus which receives the outer or head end of the pile-wires from said latch or hook and transfers them to their appropriate place at the face of the cloth.

a a a represent the frame of the loom.

b represents the cam-shaft, and *c* the lathe-shaft, which are geared together in the usual way by the gears *d* and *e*, said gears being in the ratio to give one revolution of the former to two of the latter.

f represents the race-beam of the lathe, and *g g* the swords of the lathe, which are operated by the cranks *h h* in the usual way.

i i are miter-gears, which communicate motion from the cam-shaft *b* to the counter-shaft *j*. The counter-shaft *j* turns in the stands *k k* and carries the cams which operate the wire motion, as herein to be described.

The let-off and take-up motion, shipping apparatus, and other parts of the loom, not necessary to the proper understanding of my improvements, are omitted in the drawings. The pile-wires *l l l* are formed with a head and eye on one end, as represented in Fig. 6. The

body of the pile-wires *l l l* may be round, flat, or oval, according to the length and form of the pile required. The latch or hook for drawing the pile-wires *l l l* from the cloth is represented by *m*, and may be distinctly seen in Figs. 4 and 5. It has a motion toward and from the selvage of the cloth, and is carried by the sliding bar *n*. The latch or hook *m* has also a vibratory motion on the screw *o*, and is pressed toward the pile-wires *l l l* by the spring *p*, and is prevented from swinging too far for its proper action on said pile-wires by the stop-pin *q*. When the said latch or hook *m* approaches the selvage of the cloth, the latch or hook *m* is in the position shown in Fig. 5, and as the beveled part *r* strikes the head of the pile-wire *l*, to be acted upon, the latch or hook *m* locks onto the straight part *s* of the eye. Then, as the said latch or hook *m* recedes from the selvage of the cloth, it draws out the said pile-wire *l*, as in Fig. 4, where it is represented as drawn about half out. The beveled part *r* of said latch or hook should be thick enough to allow for any variation there may be, from time to time, in the position of the pile-wire to be acted upon, so that whether the said pile-wire be a little nearer or a little farther from the breast-beam, the latch or hook will swing far enough to catch it. The sliding bar *n*, before alluded to, slides to and fro on the square bar *t*, and receives motion from the double cam *u* on the beforementioned counter-shaft *j*. The double cam *u* acts on the cam-roller *v*, and, through the medium of the upright vibrating lever *w* and connecting-bar *x*, imparts motion to the said sliding bar *n*, as aforesaid. When the latch or hook *m* has nearly completed its outward movement, the carrier which is to receive the pile-wire from said latch or hook comes to the position represented by the red lines in Fig. 4, and said latch or hook draws the outer or head end of the pile-wire into the socket of the said carrier, and a forked bar rises up to receive the other end of said pile-wire as it is drawn from the cloth. Then, when said carrier and forked bar are thus armed with a pile-wire, they move in unison back with the lathe to the point where said wire is to be inserted in the shed of the warp, as represented in Fig. 2. Then the said forked bar stops and the said carrier moves toward the selvage of the cloth, sliding said pile-wire upon said forked

bar until said wire is fairly introduced into the shed. Then said forked bar drops down to make way for said carrier, which completes the insertion of the said wire and moves forward with it to the face of the cloth and holds it in position until it is otherwise secured.

A full-sized end view of the carrier which receives the outer or head end of the pile-wires and carries them to the face of the cloth, as aforesaid, is given in Fig. 8, and a front view thereof in Fig. 7. An end view of the socket in said carrier, which receives the outer or head ends of the pile-wires, is represented at *y*.

z represents an opening in the front side of the socket *y* to allow the latch or hook *m* to pass as it draws in a pile-wire. The blue lines in Fig. 7 represent a pile-wire after it has been drawn into said socket.

a' represents a spring-binder provided with a bulge or convex projection, *b'*, on its lower end, which sinks into the eyes of the pile-wires as they are drawn into the socket and keeps them in position, and though the spring *a'* is stiff enough to keep the pile-wires in the socket during its movement, it is not so stiff but that the said socket can be withdrawn from said pile-wires without displacing them after they have been secured by the reed or the warps at the face of the cloth.

For the greater convenience in applying the motions to the carrier containing the socket *y*, the arm of said carrier is bent, as represented in Figs. 2, 7, and 8, which brings the end thereof into the proper position to be secured to the sliding bar *c'*. The sliding bar *c'* slides toward and from the lathe in suitable grooves in the sliding plate *d'*. The sliding plate *d'* slides toward and from the selvage of the cloth on the ways *e'* and *f'*.

g' represents a bar which slides on the ways *h' h'*, and imparts the sliding movement to the sliding bar *c'*. The latter piece is connected with the former by the stud *i'*, working in the long slot *j'*, so that while the sliding bar *c'* moves forward and back in unison with the bar *g'* it at the same time is free to move toward and from the selvage of the cloth when carried by the sliding plate *d'*.

k' represents a rock-shaft which rocks in the bearings *l'* and *m'*.

n' and *o'* represent arms which are affixed to and extend from the rock-shaft *k'*, and have slots at their upper extremities in which the ends of the bar *g'*, respectively, play. The arm *n'* is bent, as shown by dotted lines in Fig. 3, to clear the breast-beam.

The double cam *p'* on the cam-shaft *b* acts on the cam-roller *q'*, and, through the medium of the lever *r'* and connecting-bar *s'* and arm *t'*, rocks the said rock-shaft *k'*, and thus imparts to the above-described carrier its motion toward and from the lathe. Its motion toward and from the selvage of the cloth is given by the double cam *u'* on the counter-shaft *j*, which acts on the cam-roller *v'*, and, through the medium of the upright lever *w'* and connecting-bar *x'*, moves the sliding plate *d'*, which, as be-

fore stated, carries the sliding bar *c'*, to which the said carrier is attached. The bar *g'*, instead of sliding on the ways *h' h'*, may be carried toward and from the lathe by the arms *n'* and *o'*, in which case the ways *h' h'* would be dispensed with and the ends of the bar *g'* rest in suitable holes made in lieu of the slots in the upper ends of said arms *n'* and *o'*. In looms for some fabrics I place the bar *g'*, rock-shaft *k'*, and their appendages above the lathe.

y' represents the forked bar before mentioned for receiving the inner ends of the pile-wires as they are successively drawn from the cloth and carrying them back to the point where they are to be inserted in the warps. The upper end of said forked bar *y'* is provided with a fork, *a''*, for the pile-wires to drop into, while its lower end is jointed to the forward end of the rock-lever *b''*. The rock-lever *b''* rocks on the stud *c''*, and carries at its rear end the cam-roller *d''*. The forked bar *y'* is raised by the cam *e''* acting on the roller *d''*, but in descending follows the cam and falls by its own gravity. The forked bar *y'* is kept in its upright position and moved toward and from the lathe in unison with the aforesaid carrier by the bent lever *f''*, which has a suitable opening for it to play in at its upper end and rocks on the stud *g''*. The lower arm of the bent lever *f''* is connected to an arm extending from the before-mentioned arm *n'* by the bar *h''*, so that when the arm *n'* moves the carrier it also moves the forked bar *y'* in unison with it.

To prevent the wires from springing out of the fork *a''*, a horizontal bar may be placed just above the line of the pile-wires, so that when the said fork raises the end of any wire to carry it to the place where it is to be inserted in the warps the said bar rests upon it and keeps it in its proper place in the fork *a''*. A cam may also be employed to raise the said bar to clear the shuttle and to depress it again to act on a pile-wire; but as the fork forms no part of my present invention, these parts are not represented in the drawings.

The above-described improvements for operating the pile-wires may be used in connection with the usual guides for guiding and supporting the pile-wires as they pass between the warps.

These improvements are represented in the drawings as operating in such order of time relative to the other parts of the loom as to insert the pile-wires in the shed at the same time that the undershot of filling is being introduced. They may, however, be so operated as to insert the pile-wires when the shuttle is at rest. If the pile-wires are inserted in conjunction with the shuttle, only two beats of the lathe are required for a wire; but if they are inserted when the shuttle is at rest, three beats of the lathe for each wire are required, and though the former mode will weave the most cloth in a given time the latter mode for some fabrics is to be preferred. When the wires are inserted in conjunction with the shuttle, the figuring-warps have to be drawn

up to form an opening for the wire above the opening in the ground-warps for the shuttle, thus forming a double shed.

Having thus described my improvements in the mode of operating the pile-wires in weaving pile or terry fabrics, what I claim as new therein, and desire to secure by Letters Patent, is—

1. The employment of a latch or hook for successively drawing the pile-wires from the cloth when said latch or hook is constructed and operated substantially as specified.

2. In combination with said latch or hook for drawing out the pile-wires, the apparatus which receives the outer or head end of the said pile-wires from said latch or hook and transfers them to the face of the cloth when said apparatus is constructed and operated substantially as specified.

Boston, November 14, 1855.

ERASTUS B. BIGELOW.

Witnesses:

CHAS. HASTINGS,

FRANK F. HASTINGS.