Sheet 1. 4 Sheets.

M. C. Bryant.

Loom for Weaving Pile Fabrics.

No. 7,180. Patented Mar. 19, 1850.

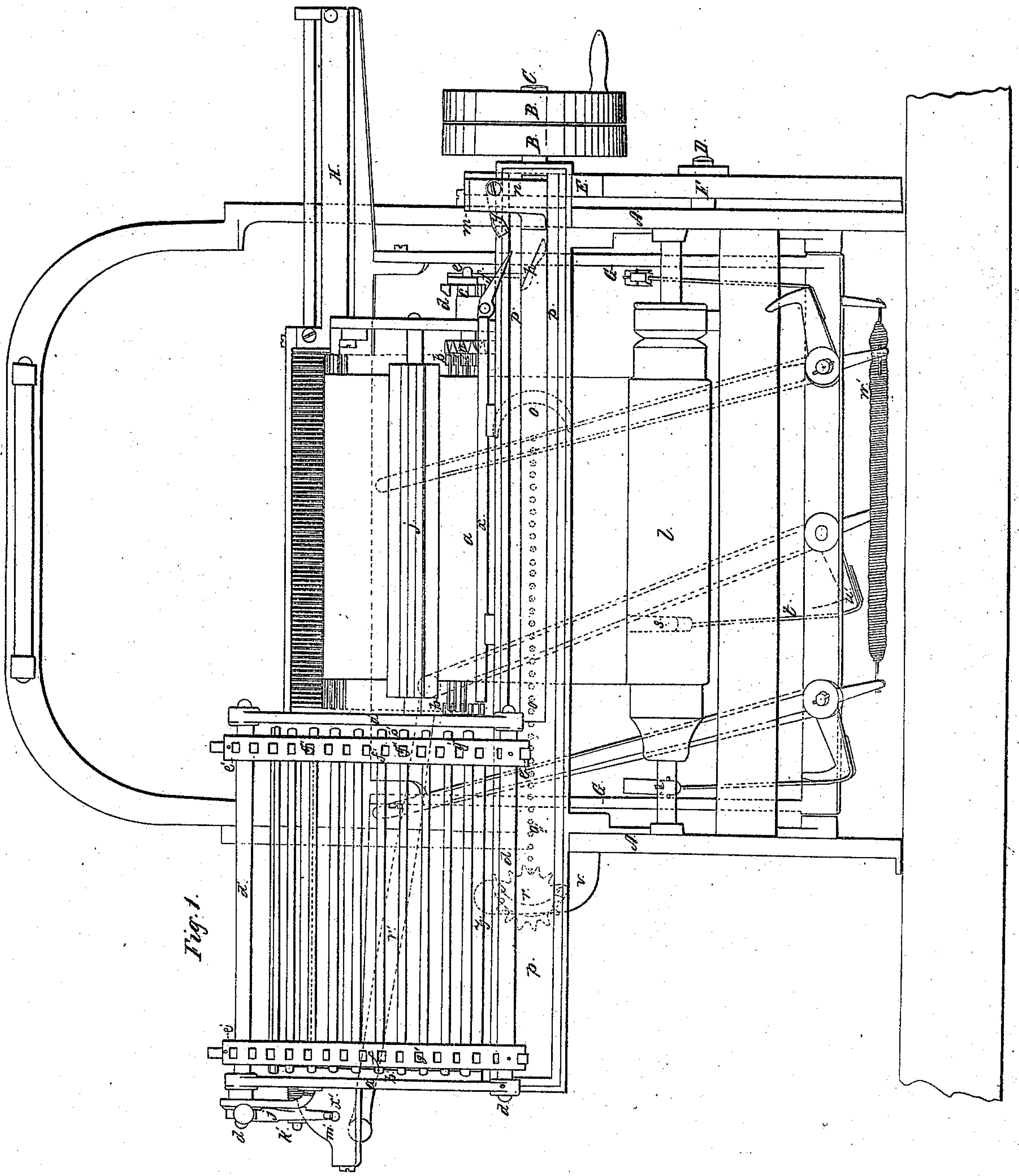

Fig. 1.

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Sheet 2. 4 Sheets.

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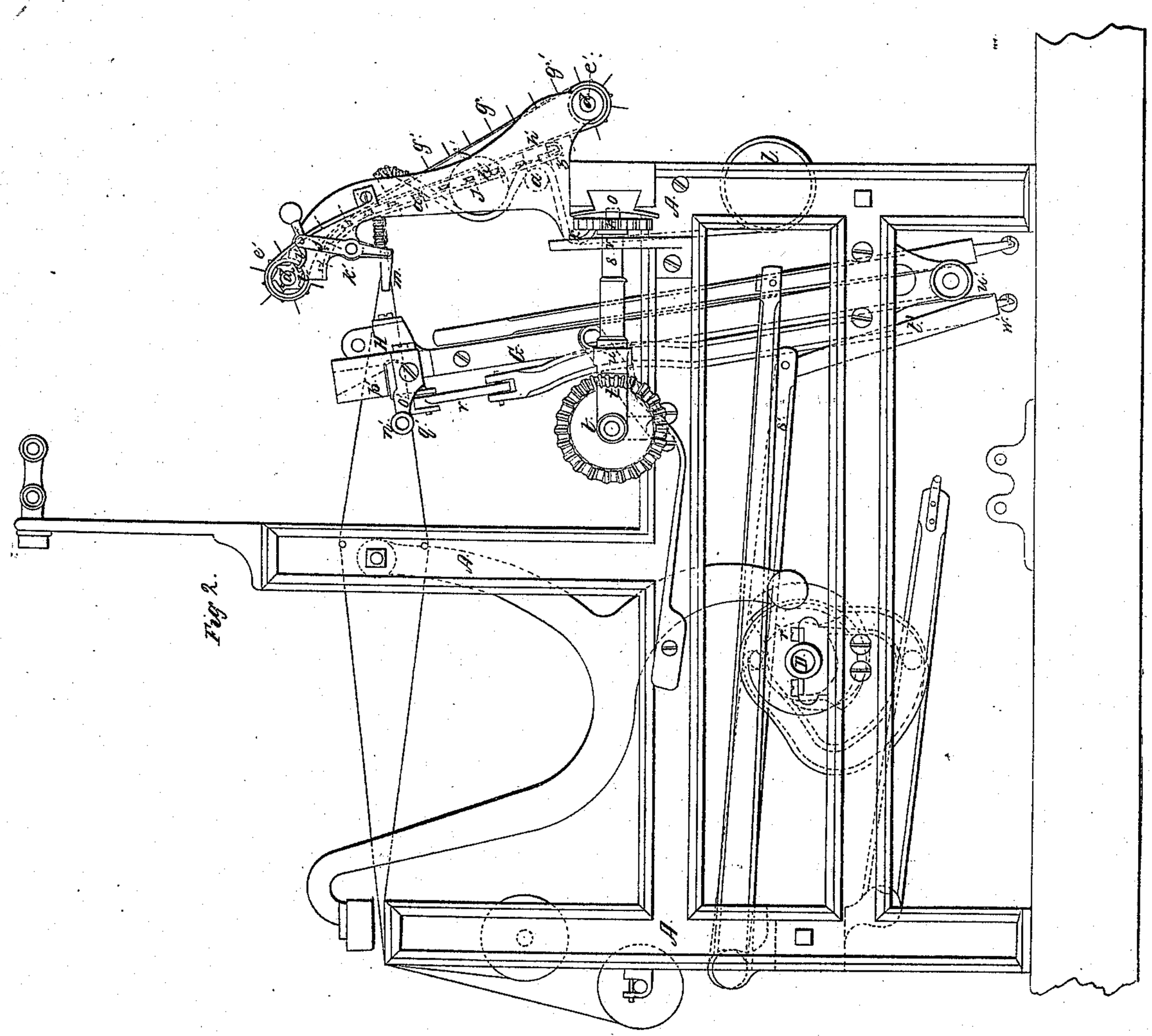

Fig 2.

Sheet 3. 4 Sheets.

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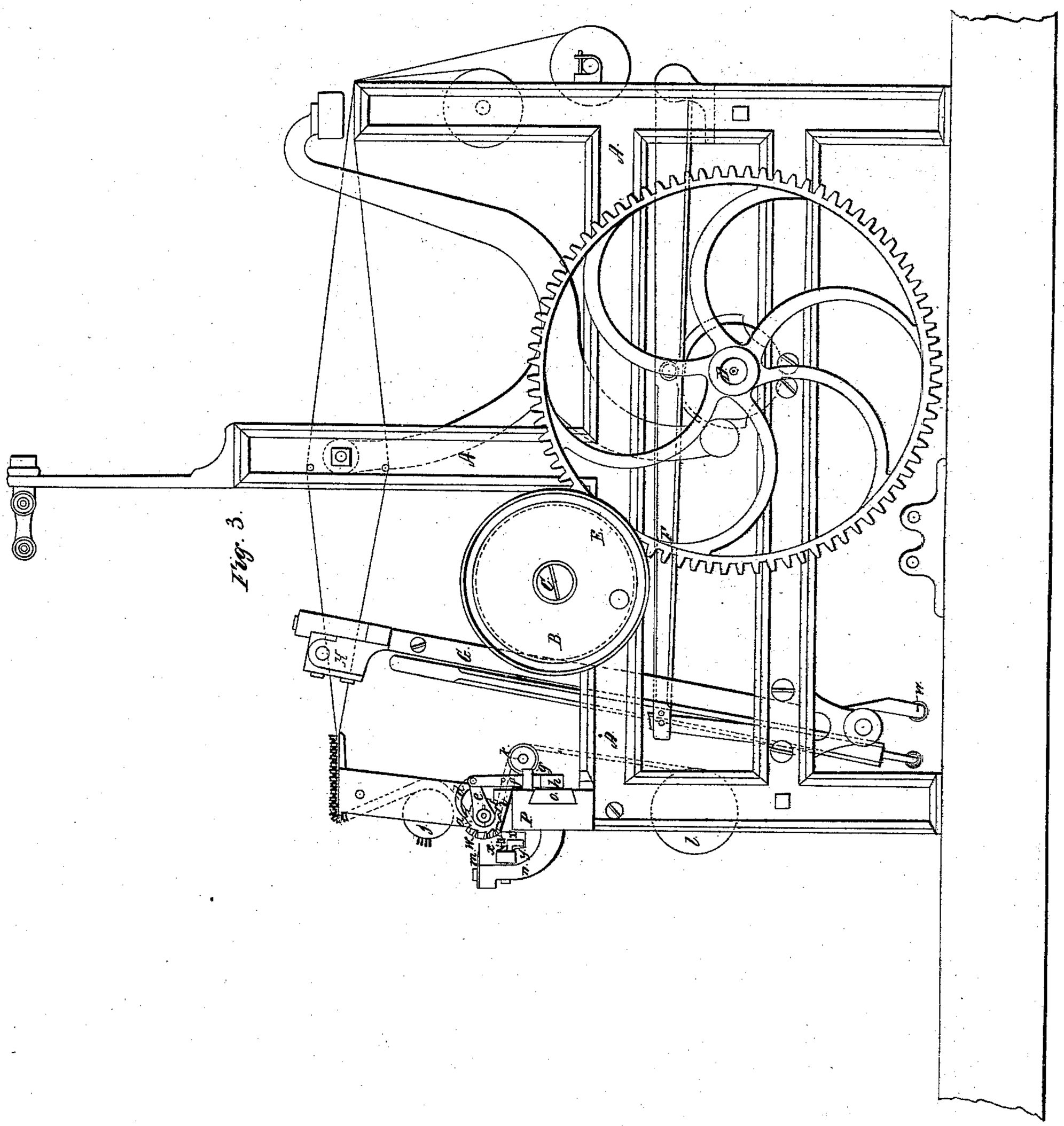

Fig. 3.

Sheet 4. 4 Sheets.

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No. 7180.

Patented Mar. 19, 1850.

Fig. 4.

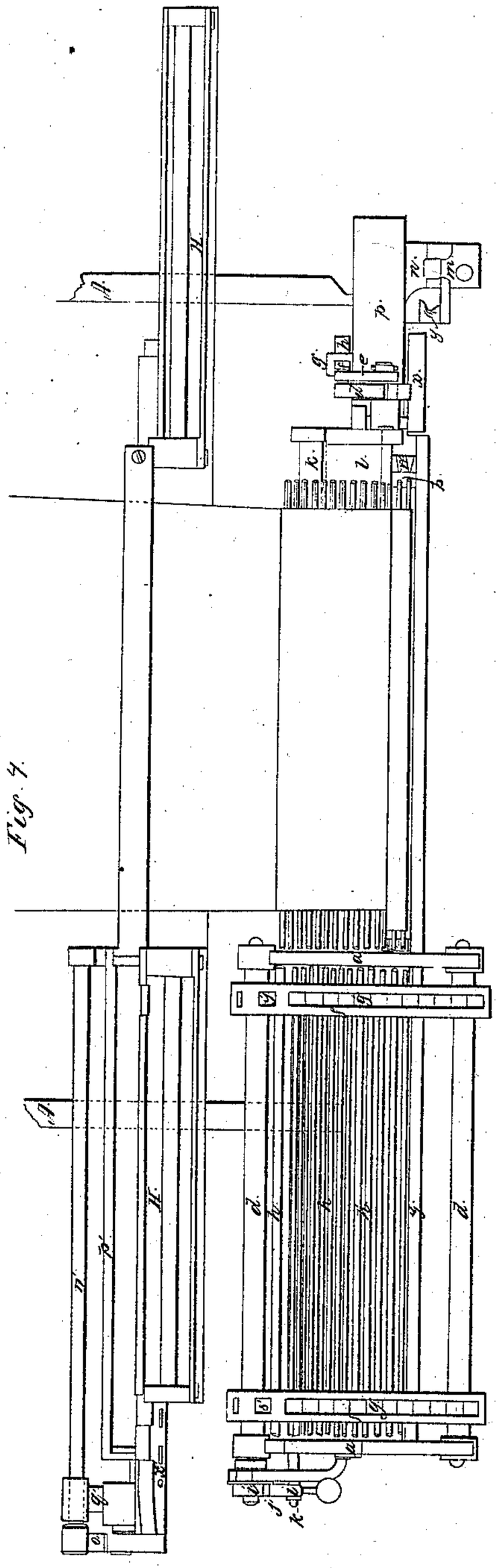


Fig. 6.

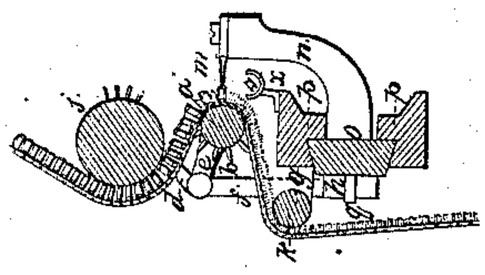
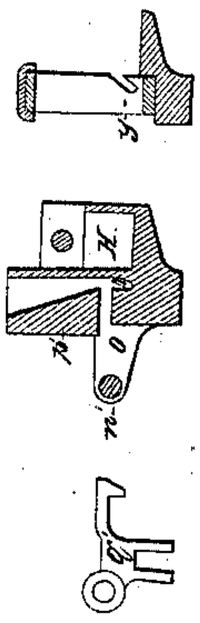


Fig. 5.



UNITED STATES PATENT OFFICE.

MERTOUN C. BRYANT, OF LOWELL, MASSACHUSETTS.

IMPROVEMENT IN LOOMS FOR WEAVING PILE FABRICS.

Specification forming part of Letters Patent No. **7,180**, dated March 19, 1850.

To all whom it may concern:

Be it known that I, MERTOUN C. BRYANT, of Lowell, in the county of Middlesex and State of Massachusetts, have invented new and useful Improvements in Power-Looms for Weaving Looped and Cut Pile Fabrics; and I do hereby declare that the following is a full and exact description of the principle or character which distinguishes them from all other things before known, and the usual mode of making, modifying, and using the same, reference being had to the accompanying drawings, which form a part of my specification.

Figure 1 represents a front view of the loom. Fig. 2 is an end elevation of the left-hand side or end of the loom when standing in front of it. Fig. 3 is a right-hand elevation of the same. Fig. 4 is a top view of the lathe and wire apparatus; Fig. 5, parts of the lathe in detail; Fig. 6, a section of the take-up rollers and pile-cutting apparatus.

The general character of my improvements consists in the following-described parts: first, the manner of cutting the wires from the pile of the cloth, whereby they are dropped into a trough or receptacle which receives them as they fall from the cloth; second, the method of transferring them from the trough or receptacle into which they drop when cut from the pile to another trough or receptacle preparatory to being introduced under the figuring-warps; third, the slotted reed by which the wires are guided between the warps.

A A A represent the frame of the loom; B B, the driving-pulleys; C, the lathe-shafts, and D the cam-shaft. E and F are driving-gears which actuate the cam-shaft in the ordinary way.

The stop-motions and many other parts which are in common use in other looms are not represented, they having no direct connection with my improvements. The warps pass from the let-off motion through the harnesses in the usual way; but the cloth is made to pass between grooved or toothed take-up rollers for the purpose of bringing the grooves of the wires into the proper position to receive the knife which cuts the pile.

a is the principal take-up roller, and is supported in its proper position near the front side of the loom by the frame A. The circumference of the take-up roller *a* should be such that the number of wires contained in an equal length of cloth may be equally divided into it, and in order to insure the wires coming to the proper position successively one after the other to receive the cutting-knife toothed wheels are employed, one on each end of the roller, as represented by *b b*.

The guide-wheels *b b* contain as many teeth as there are wires to be woven into a length of cloth equal to the circumference of the roller *a*. The teeth of said guide-wheels should be made pointed to easily pass between the ends of the wires, which fall into the spaces between them, as seen in Fig. 6.

c is a ratchet-wheel affixed to the right-hand end of the axis of the roller *a*, having the same number of teeth as the guide-wheels *b b*, which ratchet is turned one tooth for every wire cut from the pile. The ratchet-wheel *c* is actuated by the pawl *d*, and is connected by a stud-pin to the outer end of the lever *e*. The lever *e* vibrates at one end upon the axis of the roller *a* and is connected at the other end by a stud-pin to the upper end of the sliding bar *f*. The sliding bar *f* is guided and supported by the stand *g*, and is forced up by the inclined plane *h*, attached to the sliding bar *o*, which carries the cutting-knife hereinafter to be described. When the sliding bar *f* is raised, it carries the ratchet-wheel *c* forward one tooth, and when the inclined plane ceases to act the bar falls by its weight to renew its action, while the ratchet *c* is prevented from receding by the catch *i*.

j represents the top take-up roller, which is supported over the roller *a* in the usual way. Thin strips of metal extending the whole length of the roller or a part of its length, as may be most desirable, are made to project or radiate from the surface of the roller *j*, as seen in Figs. 1 and 6, at such distances from each other as to correspond with the wires in the cloth and pass between said wires as the cloth passes under the roller *j*.

k is a guide-roller to guide the cloth over certain parts of the loom as it passes down to the roller *l*, upon which it is wound. The wires being brought forward as the cloth is formed in the manner above described, the cutting of the pile is performed on the front side of the roller *a* in the following manner:

m is a pointed knife presenting its point to the roller a and affixed to the stand n. The stand n is shaped as seen in Fig. 6, and is connected at its lower end to the sliding bar o.

p is a guide-stand, which is placed across the front side of the loom, as seen in Figs. 1 and 6, and supports the sliding bar o as it traverses to and fro to cut the pile. The guide-stand p has an opening in the middle of it to allow the stand n to project forward from the sliding bar o to receive the knife m, as aforesaid.

A vibratory motion is given to the sliding bar o by the mangle-pins q q and pinion r, which work together in the usual way. The pinion r is affixed to the forward end of the shaft s. The mangle-shaft s receives motion from the lathe-shaft C through the medium of the bevel-gears t t. The back end of the mangle-shaft s is supported by the stand u, which vibrates upon the outer end of the lathe-shaft, while the forward end of the mangle-shaft s works in a slot in the stand v, whereby it is allowed to move up and down to carry the pinion r around the outer mangle-pins or teeth q of the sliding bar o. To insure the ingress of the knife m to the grooves of the wires as it passes over them to cut the pile, a toothed guide-wheel is employed which is affixed to the axis of the take-up roller a and corresponds in the number and position of its teeth to the guide-wheels b b. The outer sides of the teeth of the guide-wheels w are made wedge-shaped to facilitate the ingress of the knife. Now when the knife m moves toward the cloth to cut the pile it passes through the openings in the guide-wheel w along the grooves in the wires and cuts the pile from the wire then presented to it, which wire thus liberated drops into the trough or receptacle x. Then as the knife is carried back the inclined plane h turns the roller a, and brings a new wire into a position to be cut out. As the knife is carried forward to cut the pile the wire last cut and dropped into the trough or receptacle w is carried forward by the driver y into a similar trough or receptacle z, which receives it preparatory to being transferred to the reed, as hereinafter to be described. The driver y is jointed to the stand n so that its outer end can rise and fall freely to allow it to pass under the trough or receptacle x, when it goes back to drive forward another wire. Then to bring it up into the trough or receptacle x again the latch-cam x is employed, which rises to allow the driver y to pass under it as it goes back and carry the driver y over it as it goes forward again to the trough or receptacle x. The next step in the operation to be described is to transfer the wires from the trough or receptacle z to the trough or box on the lathe preparatory to being introduced under the warps.

a' a' are upright stands projecting upward from the guide-stand g. The upright stands a' a' are shaped as seen in the Fig. 2, and have guide-plates b' b' projecting from their inner surfaces to support the ends of the wires, as hereinafter to be described. The guide-plates b' b' have their acting surfaces even with the back side of the trough or receptacle y, as represented by the dotted lines in Fig. 2.

c' and d' are shafts which are supported parallel to each other by the upright stands a' a'.

e' e' e' e' are pulleys affixed to their respective ends of the shafts c' and d'.

f' f' are endless chains or belts passing over their respective pulleys e' e' e' e'.

The pulleys e' e' e' e' and their endless chains or belts f' f' should be so constructed as to insure a uniform motion to the endless chains or belts f' f', which may be done in the ordinary way of constructing chain-wheels. The endless chains or belts f' f' have pins or flat pieces of metal projecting from their outer surfaces at equal distances from each other, as seen at g' g' g' in Fig. 2. The pins g' g' g' pass up through openings made for the purpose in the trough z and take the wires up one after another successively and carry them up the guide-plates b' b', as shown in Fig. 2, in which the dotted lines h' h' h' represent the wires. The pins g' g' g' project beyond the guide-plates b' b' and pass up near their inner edges, while the outer surfaces of the endless chains or belts f' f' rest upon the wires and follow the curve indicated by the guide-plates b' b', as shown by the dotted lines in Fig. 2.

i is a ratchet-wheel on the outer end of the shaft c', which has teeth whose pitch corresponds with the pins g' g' g'.

j' is a vertical lever, which vibrates on the fulcrum-pin k'. To the upper end of the lever j' the pawl l' is connected by a pin-joint, and is kept in contact with the ratchet-wheel i' by the weight on its outer end.

m' is an arm projecting back from the lower end of the lever j', which is acted upon by the lathe to turn the endless chains or belts f' f' to discharge the wires. Now, as the lathe performs two or more vibrations to one wire introduced into the cloth its action upon the arm m' is intermitted, so as to act but once each wire by means which I shall describe in connection with the third and last part of my invention, which may be understood, as follows:

G G are the swords of the lathe.

H H are the shuttle-boxes, which may be constructed and operated in the usual way. Back of the shuttle-box on the left-hand end of the lathe a wire box is formed.

n' is a picker or driven rod supported by suitable stands o' o' at each end of the box. The back p' of the wire box is supported at either end, so as to form a slot or opening under it to receive the wire picker or driver q'. A groove is formed in the bottom of the wire box to receive the wire, which the acting end of the picker or driver q' is formed to fill. The outer end of the picker or driver q' traverses

the rod n' to drive in the wires. Motion is given to the driver q' by the cam r' on the cam-shaft D, through the medium of the treadle s', strap t', bent lever u' and connecting-bar v', which are connected together and co-operate in the usual way of throwing shuttles in common looms. The cam r' carries the driver forward to carry in the wires, as hereinafter to be described, and when the cam r' relieves its action the spiral spring v' draws it back again. A hole is formed in the front side of the left-hand shuttle-box opposite to the arm m', and is seen at x' in Fig. 1. To intermit the action of the lathe upon the cam r' above alluded to, the driver q' is kept by the cam r' in a position to clear the hole x', and thus allow free ingress to the arm m'; but when it is desired to act upon the arm m' the cam r' allows the driver q' to come opposite to the hole w' and drive back the arm m', turn the endless belts or chains f' f' the space of one tooth, and drop a wire into the wire box above described preparatory to being introduced under the warps, which is effected in the following manner. The dents of the reed are formed with slots or grooves, as shown at y'. When grooved wires are used, it is necessary that the grooved edges should be kept upward, to insure which the grooves in the dents y' should be formed to receive them as near that position as is consistent with their free discharge. The bottom of the groove in the dents y' should be on the same plane with the groove in the bottom of the wire-box. The fulcrum of the lathe should be so placed with respect to the warps that the grooves in the dents y' will fall below the bottom of the shed to discharge the wires when the lathe advances toward the face of the cloth.

Having fully described my improvements, what I claim as new, and desire to secure by Letters Patent, is the following-described parts, with such modifications thereof as shall accomplish the same end by analogous means:

1. The combination of the knife m and the guide-wheel w with the take-up roller a, for the purposes above set forth.

2. The trough or receptacle x for receiving the wires when cut from the pile of the cloth, in combination with the knife m.

3. The transferring of the wires from the trough or receptacle z to the wire-box on the lathe preparatory to being introduced under the warps by means of endless belts or chains, as above described.

4. The guiding of the wires under the figuring-warps by means of grooves or slots formed in the dents of the reed, as above described.

5. The grooved reed, in combination with the wire-box on the lathe, in the manner and for the purpose above set forth.

MERTOUN C. BRYANT.

Witnesses:
CHAS. G. SURGENT,
LLOYD WELLS HIXON.