

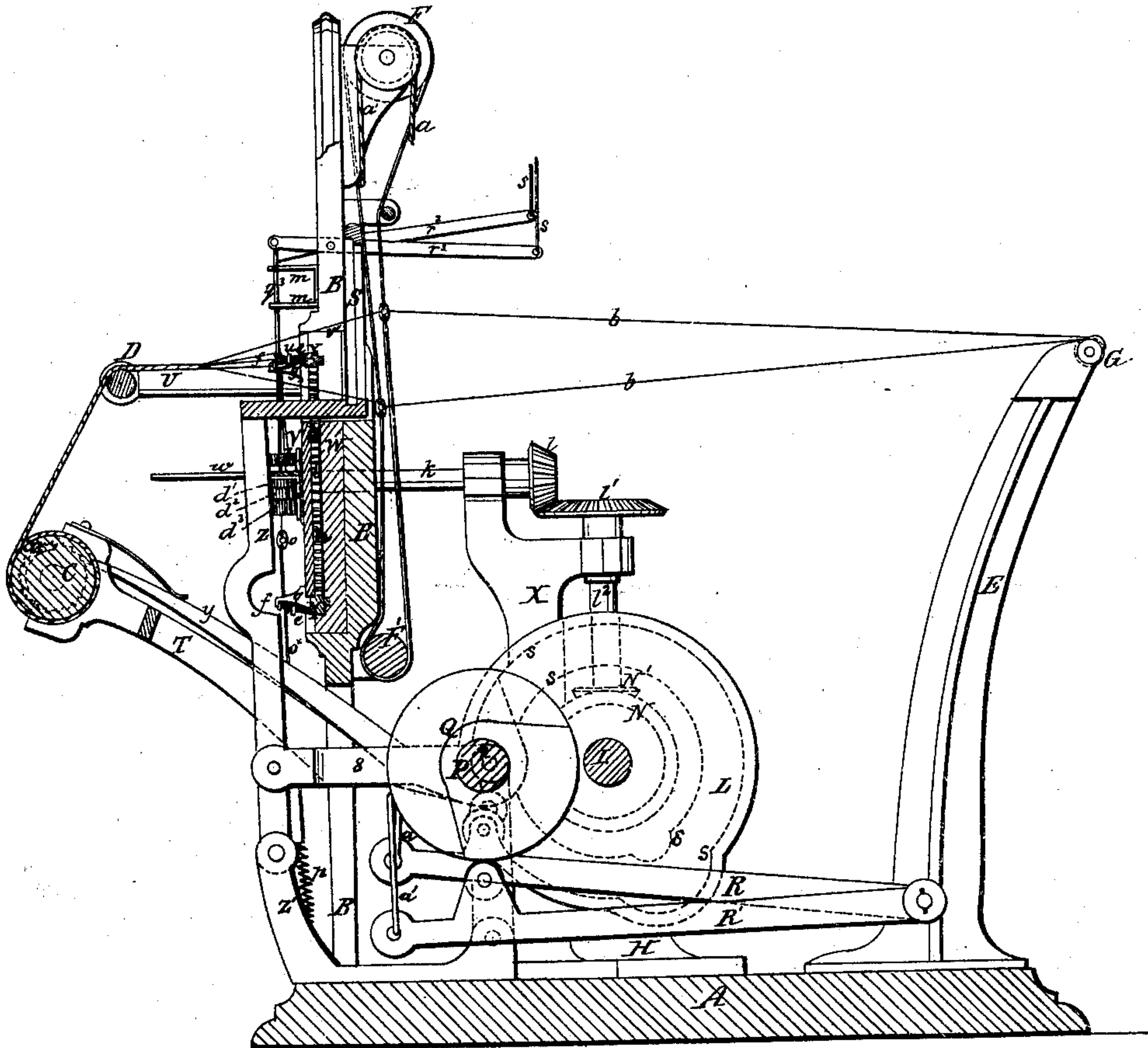
Sheet 1-2, Sheets.

F. Durand.
Circular Weaving.

N^o 16,354.

Patented Jan. 6, 1857.

Fig. 1.



F. Durand.
Circular Weaving.

Sheet 2-2 Sheets.

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Fig. 2.

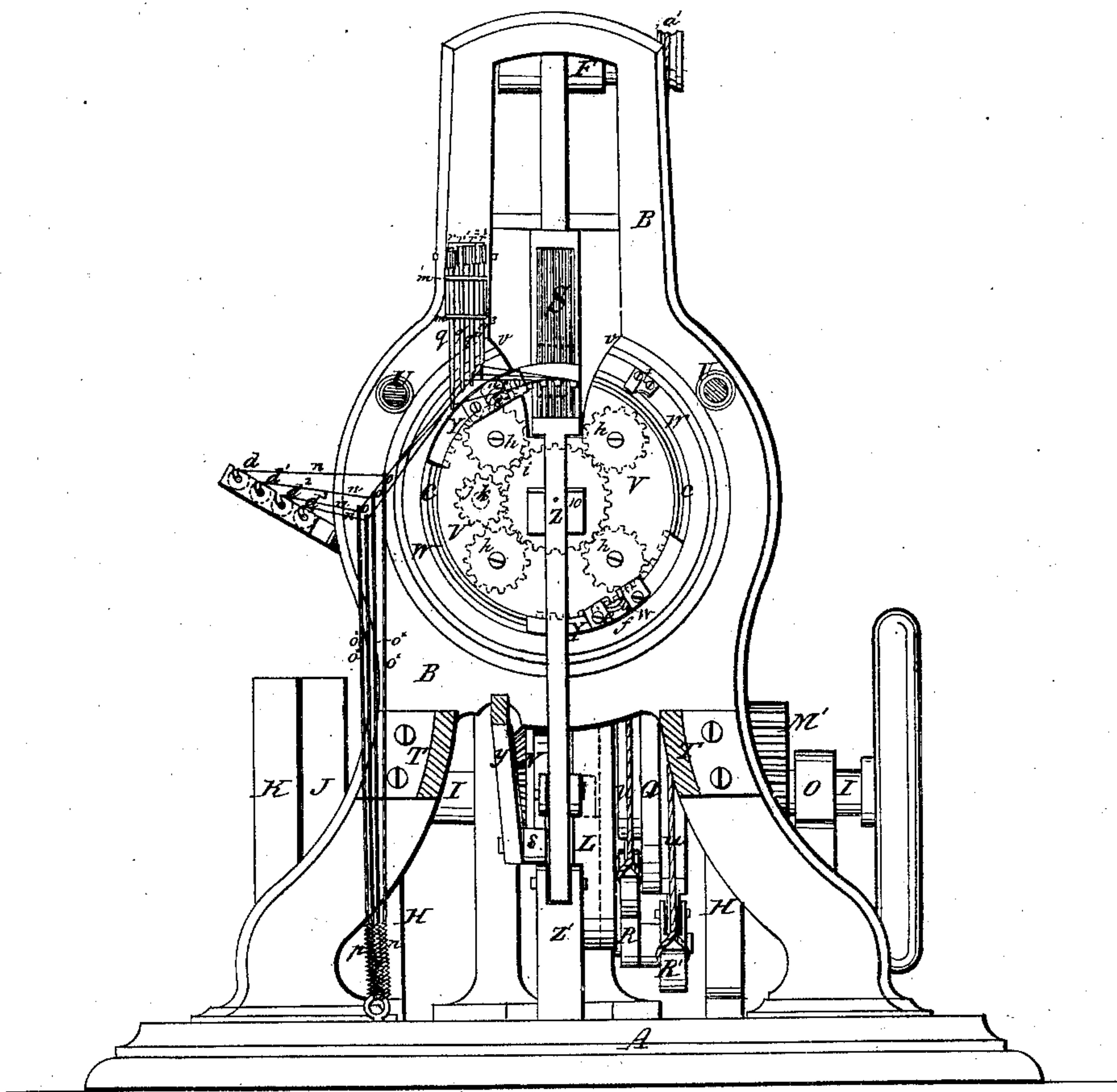


Fig. 4.



Fig. 3.

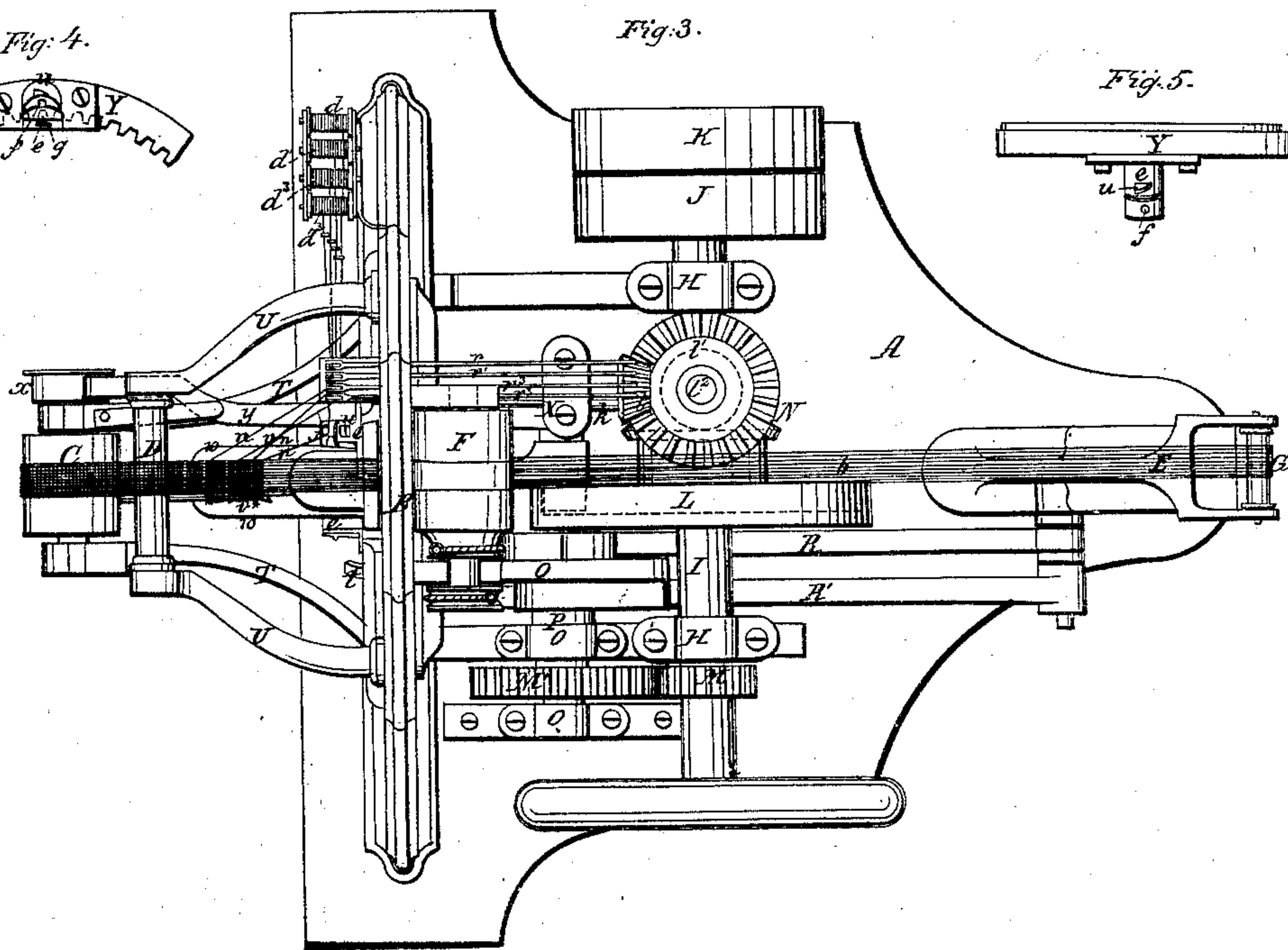
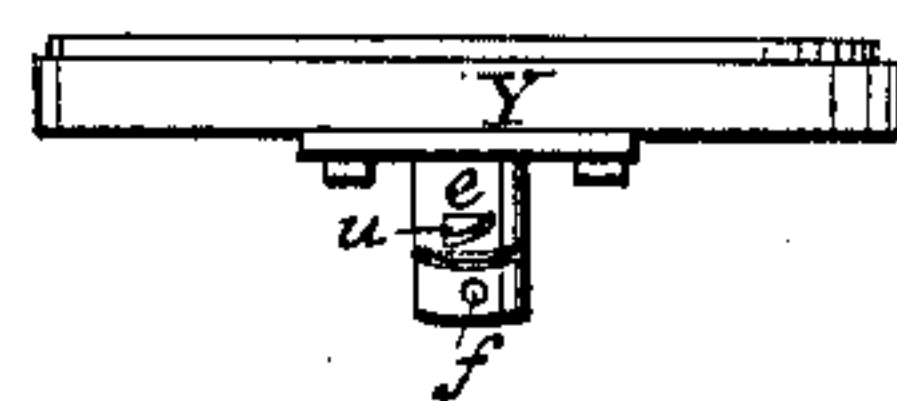


Fig. 5.



UNITED STATES PATENT OFFICE.

FRANÇOIS DURAND, OF PARIS, FRANCE.

LOOM.

Specification of Letters Patent No. 16,354, dated January 6, 1857.

To all whom it may concern:

Be it known that I, FRANÇOIS DURAND, of Paris, in the Empire of France, have invented certain new and useful Improvements in Looms; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings forming part of this specification, in which—

Figure 1, is a vertical section taken parallel with the warp, of a power loom with my improvements, said loom being constructed to weave with weft threads of different colors. Fig. 2, is a front view of the same, having the breast beam and cloth beam omitted to expose the filling device to view. Fig. 3, is a plan of the same. Fig. 4, is a front view of one of what I term the thread carriers attached, from the loom; and Fig. 5, is an outer side view of the same.

Similar letters of reference indicate corresponding parts in the several figures.

This invention relates to the placing of the weft threads between the warp threads by means of a continuous circular motion. It is applicable to plain, fancy, figured and all other kinds of weaving either by hand or power.

To enable others to make and use my invention, I will proceed to describe it, with reference to the drawings.

A is a strong bed plate upon which is erected all the framing necessary to support or carry all the working parts of the loom.

B, is an upright frame carrying the harness rollers F, F', the whole of the devices employed in putting in the weft, and also the cloth beam C, and breast beam D.

E, is a standard supporting the yarn beam G.

H H are pillow blocks supporting the main shaft I, of the loom which carries the usual fast and loose pulleys J, K, a cam I, for driving the reed S, which will be hereinafter described in a more convenient place, a spur gear M for driving the harness shaft and a bevel gear N, for driving what I term the thread carriers for putting in the weft.

O, O, are pillow blocks supporting the harness shaft P, which carries a spur gear M¹, gearing with and receiving motion from M, and a double cam Q, for operating the two harness treadles R, R¹.

The harness motion which I have shown is a plain one which needs no particular description as it is not claimed as a part of the

present invention. Let it then suffice to say that the upper harness roller is operated by cords *a*, *a*¹, from the treadles R, R¹, I will here remark that any kind of harness motion or a Jacquard machine may be employed to open the sheds in connection with my improved method of putting in the weft. The warp threads *b*, *b*, are wound upon the yarn beam G, and the work passes over the breast-beam D, to the cloth-beam C, in the same manner as in other looms. The cloth-beam works in bearings in brackets T, T, secured to the front of the frame B, and the yarn beam is rigidly held by two brackets U, U, secured to the front of the said frame.

The frame B, is fitted with two upright circular plates V, and W, which are united by short stays in such a manner as to hold them at a sufficient distance apart for a train of spur gearing to work between them. These plates are so formed as to make a stationary circular raceway *c*, *c*, for the thread carriers Y, Y, to travel in, for the purpose of passing through the open sheds of the warp with a continuous circular motion and putting in the weft. The thread-carriers, of which there are two, consists each of a toothed segment fitted to the raceway and having attached to its front face, by screws, a short hollow arm *e*, provided with a small movable pin or finger *f*, which is attached to a spring *g*, in its interior, see Fig. 1, and protrudes through a small hole in the arm for the purpose of catching the weft threads *n*, from a series of bobbins *d*, *d*¹, *d*², *d*³, arranged at one side of the frame B, and carrying them through the warp. The thread carriers derive their continuous circular motion from four pinions *h*, *h*, *h*, *h*, between the plates V, W, said pinions gearing with the toothed segments of the thread carriers and also with a central spur gear *i*, which derives motion from a pinion *j*, on a horizontal shaft *k*, which carries a bevel gear *l*, gearing with a bevel gear *l*¹, on the top of an upright shaft *l*², at the bottom of which is a bevel gear N¹, gearing with the bevel gear N, on the main shaft. The shaft *l*², is supported in a standard X, which also contains one of the bearings of the shaft *k*.

In front of the frame B, B, there is a guide plate *m*, containing a double set of guides for a set of upright needles *q*, *q*¹, *q*², *q*³, which correspond in number with the bobbins at *d*, *d*¹, *d*², *d*³. These needles have eyes at their lower ends through which the

weft threads n , from the bobbins pass on their way to the warp, first, however, passing through metal eyes o , connected by cords o^* , with springs p , that are secured to the base A, or other part of the loom framing. At their upper ends, the needles are attached to levers r, r^1, r^2, r^3 , whose movements are controlled by a Jacquard machine (not shown), to which they are connected by cords s , in such a manner that every time a shed is opened, the depression of that needle whose weft thread is required by the design to be shot across the warp, takes place, the other needles being held up in the meantime either by the weight of the rear arms of their levers or by other suitable means. The needle which is depressed, as above stated, brings its thread within the circle described by the points of the fingers f , of the thread carriers and one of the thread carriers revolving in the direction of the arrow shown near it in Fig. 2, catches the said thread and carries it through the open shed.

In Fig. 1, the blue thread from the bobbin d , is represented as having been conducted by the descent of the needle q , within the range of the thread carrier and to be just about to be taken through the warp, and in Fig. 2, the same condition of things is represented. It will be readily understood by reference to the latter figure:— that the thread thus carried through the shed is doubled. As soon as the thread carrier has taken the thread entirely through the warp, the arm e comes under what I call the unhooker, t , which is a stationary curved piece of metal secured to the front of the frame A, and on which, as the thread carrier passes it, presses on a small knob u , on the spring g , that protrudes through a hole in the arm e , and by that means the finger f , is caused to be drawn entirely within the arm e , and thus the thread is liberated. The loop or bend which has been formed in the thread by the finger f , when it is liberated by the said finger, is caught on a fixed needle v^* , see Fig. 3, which is secured in the breast beam and stands parallel with and close by the side of the cloth and thus prevents the thread being drawn back again through the warp, by the action of the springs p , on the metal eyes o , but, at the same time, permits it to be drawn tight. The loops remaining on this needle are liberated from time to time, as the weaving proceeds, by the attendant drawing forward the needle through the breast beam. When a clean and distinct selvage is required, I employ another method of retaining and securing the above described loops of the weft threads. One, two or more thread-carriers

may be used, each one requires to complete its revolution in the interval of time that is occupied in two or more sheddings and they require to be always at equal distances apart. I have shown two, in the drawing, as I consider that number to be most convenient in practice.

In order to allow the reed S, to operate to beat up the weft, a deep recess v, v , see Fig. 1, is made in the plates V, W, to allow the reed to pass through or across the shuttle race. The thread carriers, to operate properly, must have their segmental parts Y, Y, considerably longer than is sufficient to enable them to reach across the above-mentioned recess v, v . The reed S, is attached to a long vibrating arm Z, which works on a pivot in a stand Z^1 , secured to the bed plate. A guide 10, is provided for the arm Z, secured to the front of the plate V. The necessary motion of the reed is produced by the action of the groove 6, 6, of the cam L, on a roller F, which is attached to a rod 8, that is connected to the vibrating reed arm Z. The rod 8, and roller f , are kept in proper operative position by a rocker 9, which is shown in dotted outline in Fig. 1. This rocker has attached to it the pawl y , which acts upon a ratchet x , on the cloth beam to produce the take-up motion; but any other way of producing the take-up motion that is applicable to other looms is applicable to this loom.

It will be seen, that, by the above-described arrangement of bobbins, thread-carriers and needles, any number of colors may be employed in the weft, using one or more thread carriers. When, however, only one color is required in the weft, the thread carrier, arranged in the circular raceway as above described, may be furnished with a bobbin like a shuttle and may have a reciprocating motion, passing through the shed in opposite directions alternately.

What I claim as my invention and desire to secure by Letters Patent, is—

1. The combination with a stationary raceway of a reed passing entirely through the same, substantially as herein specified.

2. The weft thread needles q, q^1, q^2, q^3 , controlled by a Jacquard machine or other pattern mechanism, to operate as herein described upon the weft threads in combination with a thread carrier of the character herein specified.

3. The unhooker t , operating in combination with the thread carrier, substantially as and for the purpose herein specified.

F. DURAND.

Witnesses:

A. CAVESTIN,
ADOLPH LE BLANC.