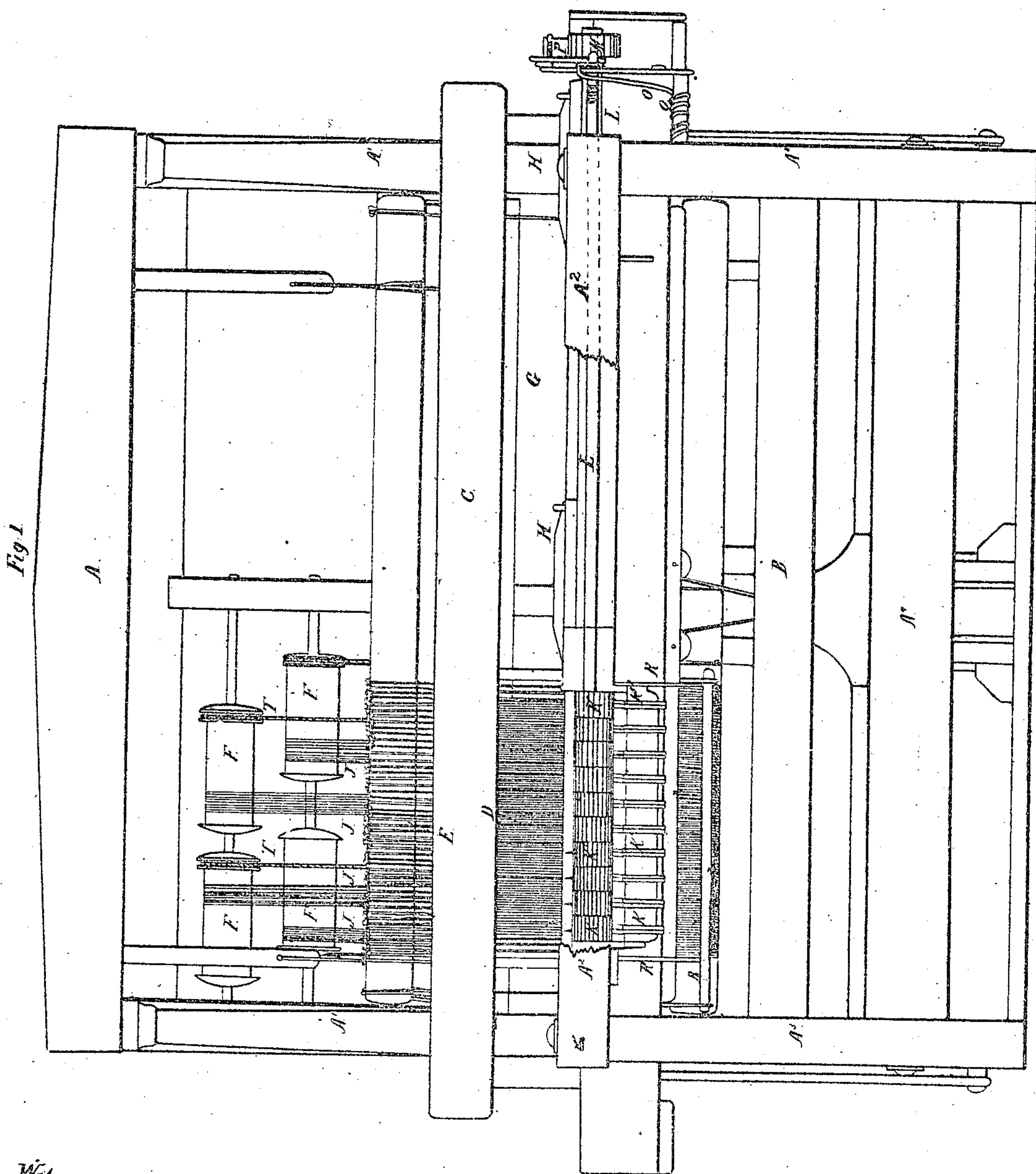


W. Breitenstein.

Loom.

No 37,556.

Patented Jan 27. 1863.



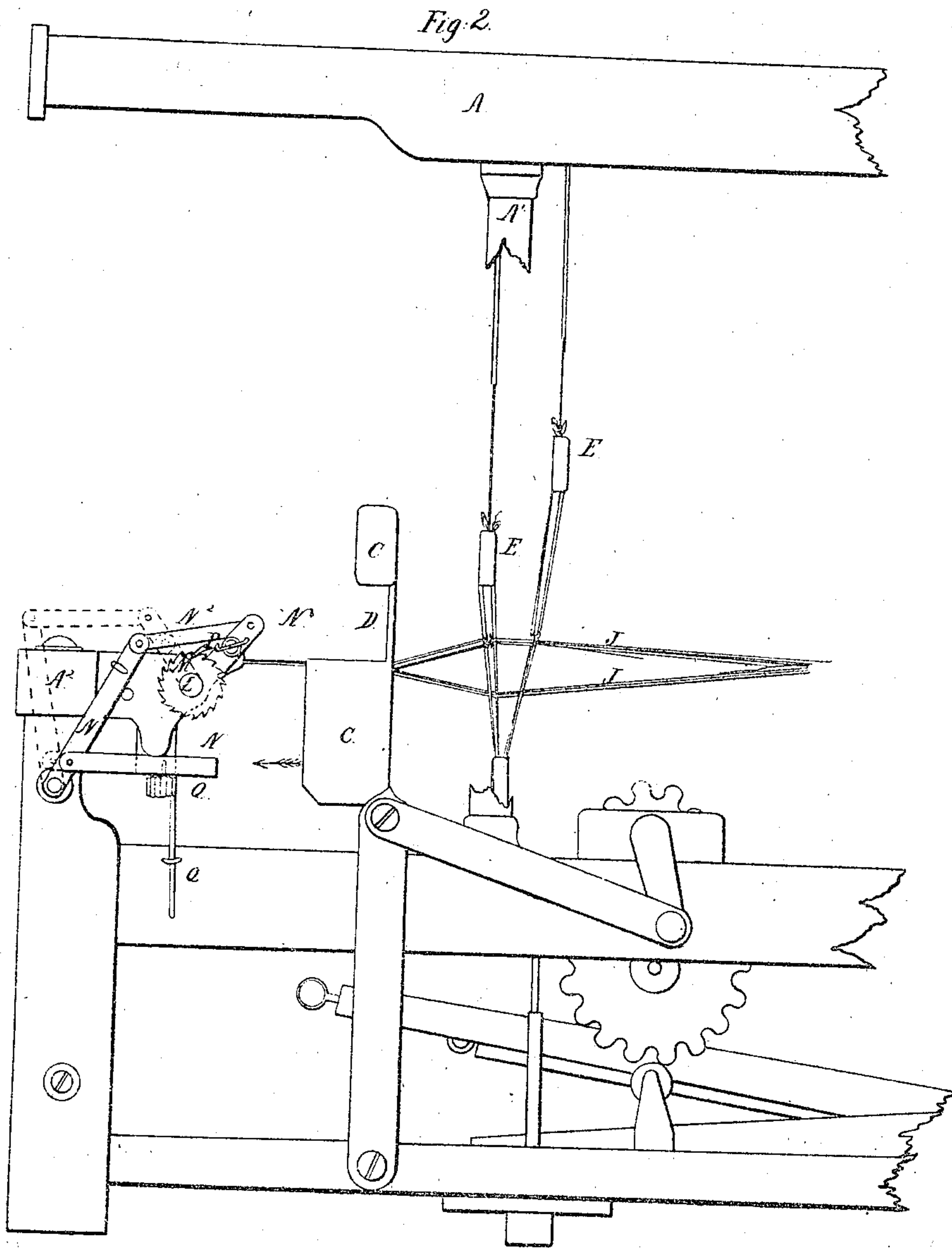
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Fig. 3.

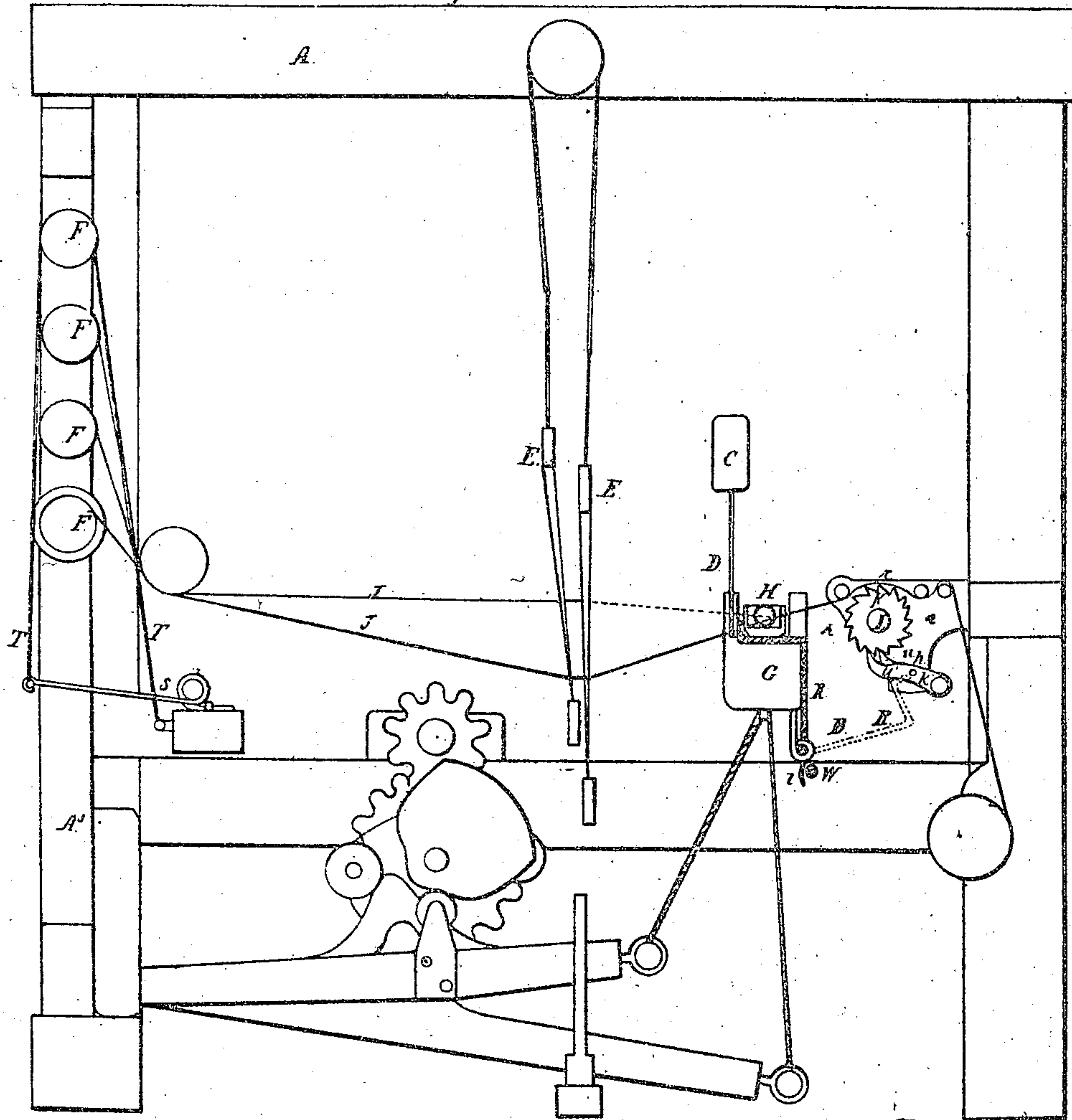


Fig. 4.

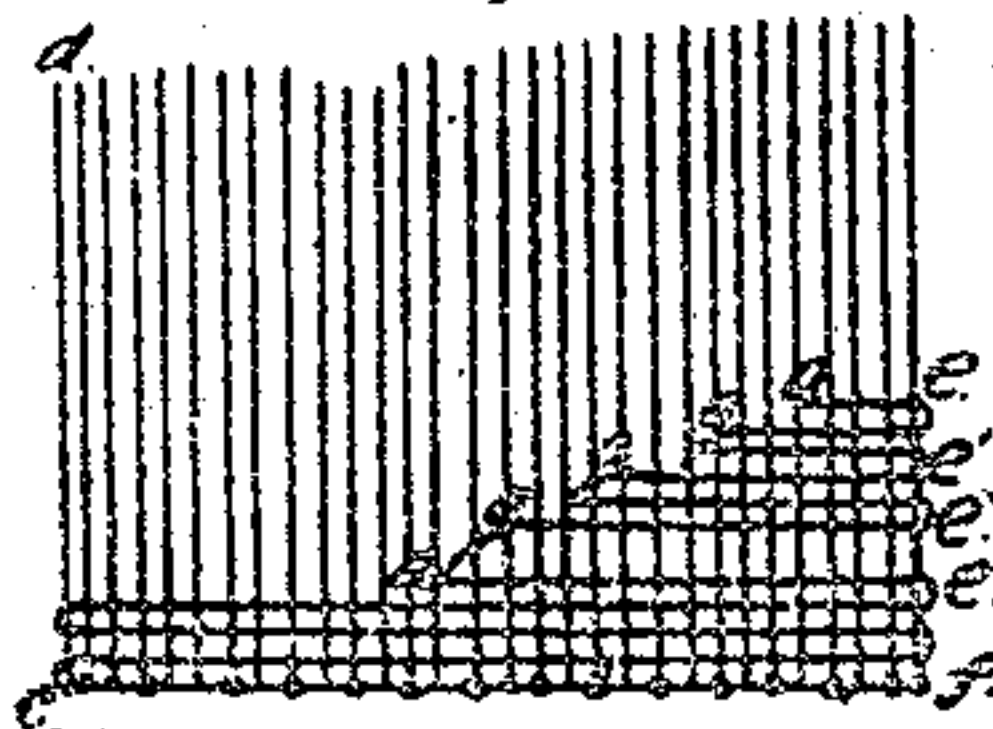
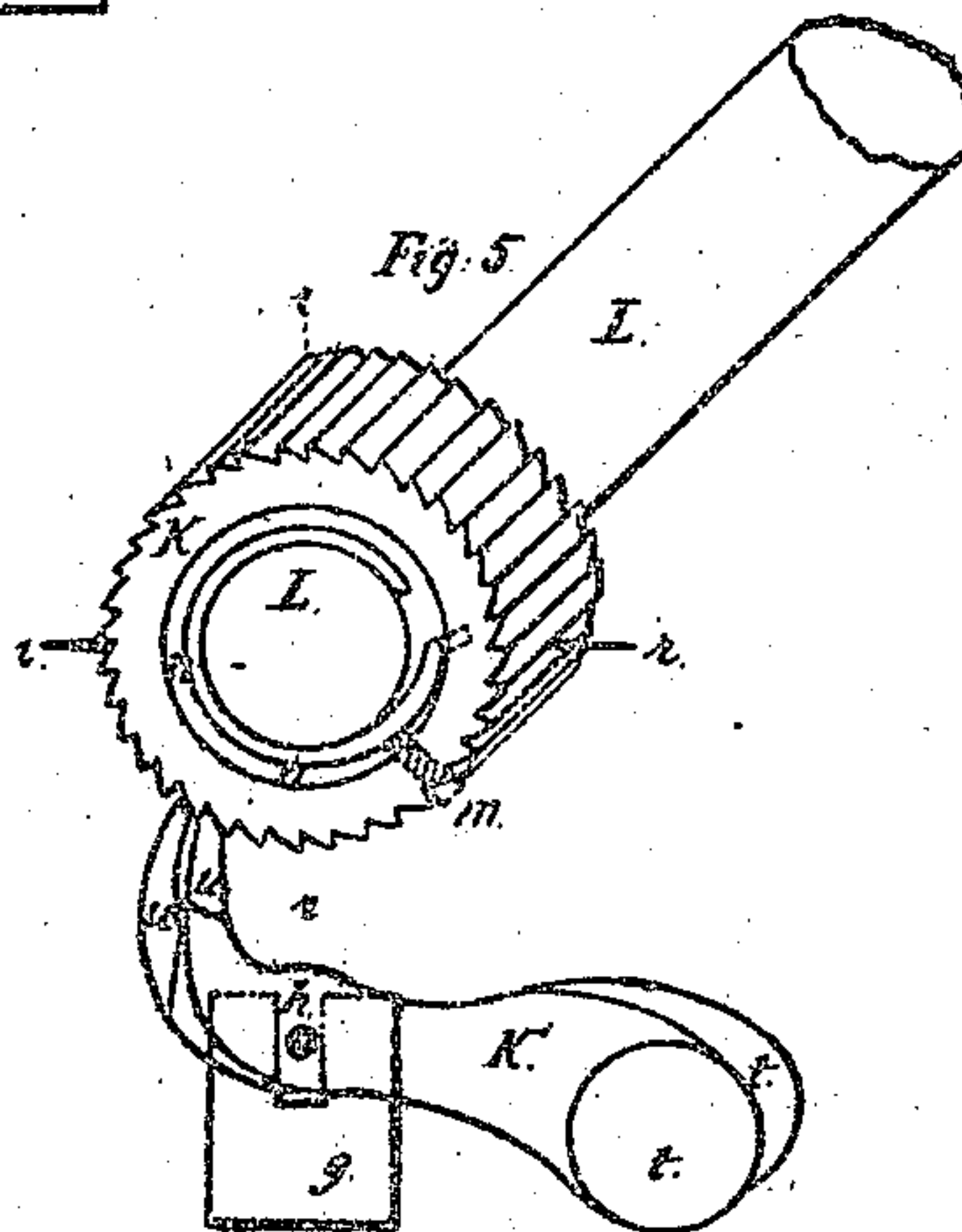


Fig. 5.



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UNITED STATES PATENT OFFICE.

WILLIAM BREITENSTEIN, OF NEW YORK, N. Y., ASSIGNOR TO FISCHER & CO., OF SAME PLACE.

IMPROVEMENT IN LOOMS FOR WEAVING CORSETS.

Specification forming part of Letters Patent No. 37,556, dated January 27, 1863.

To all whom it may concern:

Be it known that I, WILLIAM BREITENSTEIN, of the city, county, and State of New York, have invented a new and useful improvement in the weaving of corsets, or other articles of irregular form, and in the looms for weaving the same; and I do hereby declare the following to be a full and exact description thereof, reference being had to the annexed drawings, making part of this specification, in which—

Figure 1 is a front elevation of the loom, with parts of the frame broken off for the purpose of showing the regulator and its axis; Fig. 2, a side elevation of the loom; Fig. 3, a cross section of the same. Fig. 4 represents the usual method of weaving corsets or other irregular-shaped fabrics. Fig. 5 shows the cross-section and perspective of a ratchet-wheel and the axis of the regulator with the double pawl underneath the same and in its proper position.

The entire length of the axis L is covered with similar ratchet-wheels, each of which is acted on by similar pawls.

The same letters mark the same parts in all the figures.

I deem it proper to state that hitherto corsets have been woven by interlacing the filling with a certain number of threads of the warp, next with a smaller number of warp-threads, next with a still smaller number, and so forth, until the border of the woven part of the fabric formed an oblique line with the cloth-cylinder, when the said oblique line of the fabric was drawn and adjusted by hand on a row of pins parallel with the cloth-cylinder until it was brought again in line with said row of pins. By these operations the concave and convex shapes of the cloth as required for corsets were formed, but the same were attended with delays and difficulties, as the weaving had to be interrupted in order to perform the said operations.

The usual manner of weaving irregular-shaped cloth, such as corsets, is represented in Fig. 4.

c d represent the warp-threads.

a e a e', &c., represent the filling-threads.

c f represent a row of pins on a bar or rod parallel with the cloth-cylinder.

It will be seen that, in order to obtain the ir-

regular shape of cloth, the filling, instead of being interlaced with all the threads of the warp, interlaces only with a part of the same, next with a smaller part thereof, next with a still smaller number, and so forth, until the form of the woven cloth is bounded by a line, *a a a*, oblique to the line *c f*. In the hand-looms this operation is accomplished by taking out and putting in the shuttle at *a a a*, instead of throwing it through the whole number of warp-threads. In the Jacquard looms the same operation is accomplished by the machine lifting up the number of warp-threads required and by carrying the shuttle through that number only. In both instances the filling has to be tightened by hand, and in both instances the cloth has first to be removed from its fastening-pins at *c f*, and then to be fastened on the pins in such a manner that the line *a a* should come on the line *c s*, and be fastened to the row of pins thereon. In this manner the cloth receives a concave or convex shape, and thereby those waves in the cloth are produced which are required for corsets.

The object of my invention is to weave corsets or other irregularly-shaped articles or fabrics regularly and without any interruptions, much in the same manner as the usual cloth is woven. For this purpose I have constructed a Jacquard power-loom with a peculiar divided and self-adjusting take-up or regulator, and a peculiar filling-tightener or thread catcher, by means of which the adjustments on the cloth-cylinder and the formation of the waves in the fabric are performed gradually and regularly, as required during the process of weaving by the said power-loom.

To enable those skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

A represents the upper part of the frame, A' the columns supporting the same, and A², A³, and A⁴ represent the lower parts of the frame.

C G represent the reed frame or lay; D, the reed; E, the heddles; F, the spools containing the warp-threads; H H, the shuttles; J J, the warp-threads.

My regulator for stretching the cloth gradually during the weaving and by the action of the loom is constructed in the following manner: The axle L contains a number of ratchet-

wheels, K K K, each one of which contains a spring, n , on the inside, grasping the axle L, and a screw, m , is inserted through each wheel K and acts on the spring n for the purpose of tightening or loosening the said spring. When the reed-frame strikes the lever N, (that being done always after every throw of the shuttle,) the system of levers N N' N² N³ acts upon the ratchet P, which, in its turn, acts upon the ratchet-wheel M, and this, being immovably fixed to the axis L, will cause the said axis L to partially revolve all the ratchet-wheels K, and by the friction acting through the spring n these wheels tend to revolve equally in the same direction, and thus, by the means of the pins $r r$ projecting therefrom, to take up all the width of the cloth equally; but this equal action does not follow. The resistance of the springs or weights S on the several warp-threads is greater than the friction of n upon the shaft L. When the reed strikes the cloth of the last thread of the filling $a e$, it tends to shove the cloth to the width of $a e$ back on the regulator, whereby those ratchet-wheels K of the regulator which coincide with or are opposite to $a e$ are aided to turn with the shaft L by the power of the stroke, and revolve while all the other wheels K remain stationary. Pawls K' K' are so mounted as to apply to the under side of each wheel K and to prevent any reverse motion. If it be supposed that $a e^3$ formed the last line of the filling, those ratchet-wheels only of the regulator corresponding with that line would be acted upon, and, thus aided, the cloth, to the width of $a e^3$, would be moved forward on the regulator, and thus the oblique line $a a a a a$, which, in the usual looms, has to be drawn forward at intervals by hand to the line $e f$ of the pins, is here drawn forward to that line by the regulator at every stroke of the lay. Thus, on the usual loom, if the weaving had reached to the line $a e$, the operation of weaving would have to be stopped entirely, and the weaver would be obliged to pull the cloth forward by hand until the points $a a a a a$ were brought back to and fastened on the line of pins $e f$, by which said operation the hollow or wave in the cloth is formed, whereas in my loom the line $a e^3$ is drawn forward immediately after being formed. As soon as the next line, $a e^2$, is formed it is again moved forward, and so on, while the other edge of the cloth is not moved. In this manner I effect the moving of that part of the cloth (which otherwise would have to be performed by hand) by the machine during the process of weaving.

O is a spring connected with the levers N N', &c., which tends to urge them in a direction toward the lay.

Q is a spring which supports a jointed bar, through which the lay G acts upon and gives motion to the said system of levers.

R R, Fig. 3, are the thread-catchers.

S S represent springs or weights to produce the proper strain on the warp-threads.

T T are the springs by which the said

weights or strings are connected with the spools of the warp, so as to act by friction thereon in the usual manner.

$r r r$ are pointed pins on the ratchet-wheels of the regulator. There are several pins, $r r$, and one spring n and screw m in each wheel K.

g is the block in which the axle h for the double ratchet K' is mounted. This double ratchet is composed of two similar but independent levers, of which $t t'$ are respectively the heavier or weighted arms, which, by their greater weight, keep the same in their proper position, so that while one of the fangs, u , keeps one tooth of the wheel, the other fang, u' , stands on the half of the next tooth. At each revolution of the main shaft I of my loom the shuttle II flies quite across the entire fabric and back again, even though the operation of the Jacquard has been such as to induce the useful retention of the filling-yarn in only the small portion $a e^3$, or the still smaller portion, $a e$. Under such circumstances it is obvious the filling-yarn is liable to lie in or about the fabric in a slack condition; but this evil is prevented by the timely operation of the filling-stretcher before alluded to. The filling-stretcher is represented by the rocking shaft B and bent lever R. The shaft B is mounted in the batten C G and is free to turn therein. There are two bent levers, R, fixed thereon, so as to stand near each edge of the cloth, each being a wire of sufficient rigidity to pull up and retain the slack of the filling-yarn, when any exists, and to pull more out from the shuttle if necessary. At every forward motion of the batten C G the short arm i is moved against or past a movable stop, W, which latter is mounted on the framing of the loom, and is operated by the Jacquard mechanism, so that it may be effective or not, as desired. A spring (not represented) tends to hold the levers R up close to the batten C G, in the position indicated by the dark lines in Fig. 3; but when the lever i is brought into contact with the stop W the shaft B is partially rotated, so as to throw the levers R forward into the position shown by the red lines, and the upper ends of R are adapted to catch the filling-yarn and pull it so as to tighten it. There being a lever, R, at each edge of the cloth, it follows that the yarn is certain to be caught and stretched, whether the shuttle traverses across from right to left or from left to right. The quantity of slack to be taken up in each instance obviously depends on the breadth of the cloth in which it is not retained. Thus there will be more slack after the throw which produced $a e$ than after the throw which produced $a e^3$. I can, if necessary, employ a multiplex stop instead of the single one represented at W, or can operate a single one, so as to induce various degrees or extents of motion in the levers R, according to the quantity of slack to be taken up—a matter easy of accomplishment from this specification by any one familiar with Jacquard mechanism, but I do not find it necessary. I prefer to use a

single and simple stop, as represented, causing the levers R to turn far enough to take up the utmost slack that can ever be formed, and when less slack is formed the surplus motion of the lever R will always be provided for by the ready discharge of more yarn from the shuttle, which surplus yarn will be disposed of in the ordinary way on the return of the shuttle—that is to say, if the slack of the filling-yarn is all taken up before the lever R has completed its motion, then the further motion of the lever R will not break the filling-yarn, but will simply pull more of it out from the shuttle, and on the return of the shuttle the quantity already out in the form of slack will be taken up in the cloth before the shuttle will commence to deliver off any more. By the action of the Jacquard I withdraw the stop W, so as to induce no such action of the lever R whenever the loom is weaving quite across, but whenever it is weaving the gores *a e e*, or any part less than the entire breadth of the fabric, I allow the filling-stretcher to have its full motion, as described.

The looms, with the improvements herein described, if made of sufficient width and provided with suitable shuttles, &c., are capable of weaving two or more pieces of cloth on one loom, which is also an advantage the existing cloth-looms are not capable of.

Having now fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The employment, in looms, of a take up

mechanism, which takes up portions of the breadth of the cloth independently of the other portions of the breadth, in the manner substantially as herein specified.

2. Regulating or determining the action of the several parts of such irregular take-up by the differing force of the impact of the lay on the different parts of the breadth of the cloth, in the manner substantially as herein set forth.

3. The employment, in a loom, of a multiple roller, substantially as herein described and represented by K K L, for the purpose set forth.

4. Imparting a yielding force to the several sections of such roller, so as to maintain a constant or nearly constant tension on all parts of the breadth of the cloth during the weaving of corsets and the like irregular articles, substantially as specified.

5. The combination of suitable pawls, K', with the ratchet-wheels K and shaft L, and frictional connection *n*, or their respective equivalents, for the purpose herein set forth.

6. The employment, in looms for weaving corsets and other irregular cloth, of the filling-stretcher, operating substantially in the manner and for the purpose herein set forth.

7. Controlling the operation of the filling-stretcher B R by the movement of the stop W, or its equivalent, substantially as and for the purpose herein set forth.

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A. WEHLE.