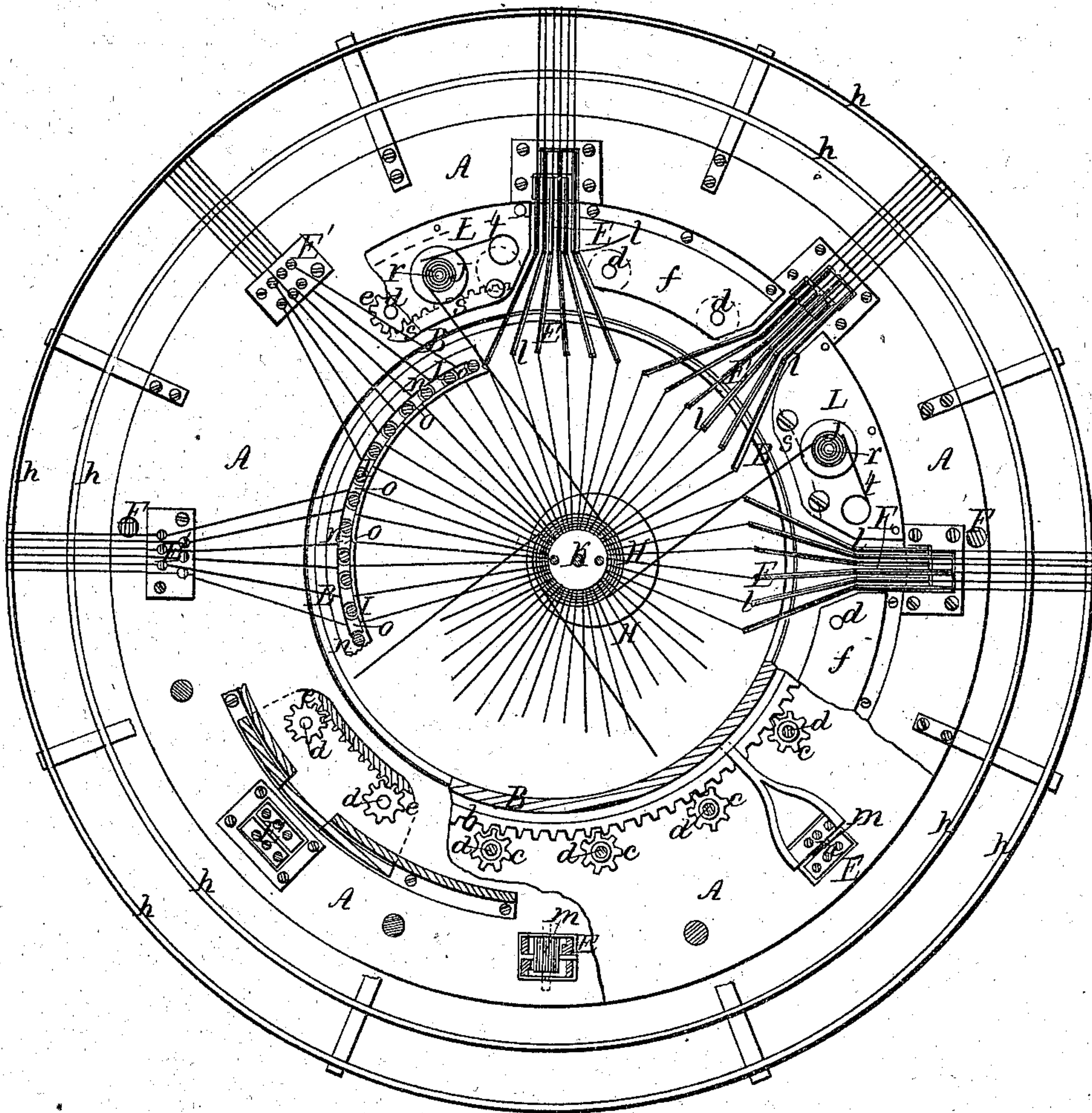


A. WAGNER.  
LOOM FOR CIRCULAR WEAVING.

No. 81,438.

Patented Aug. 25, 1868.

Fig. 1.



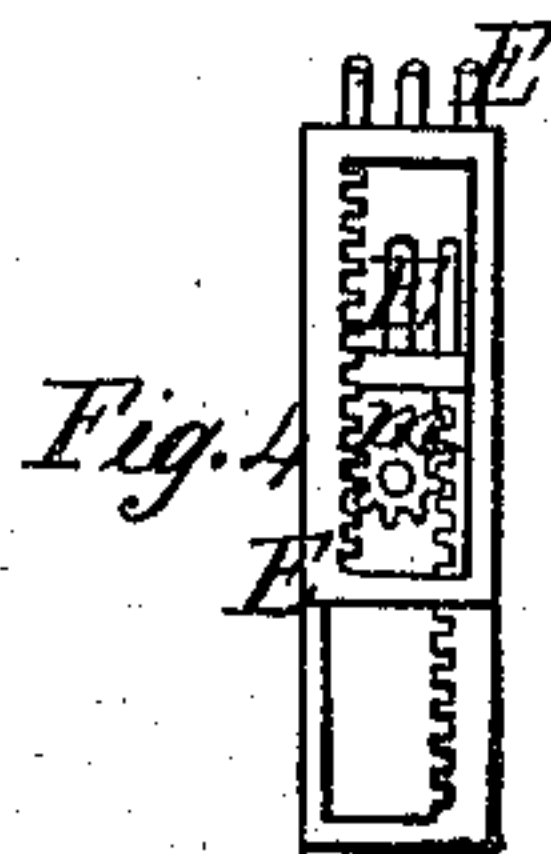
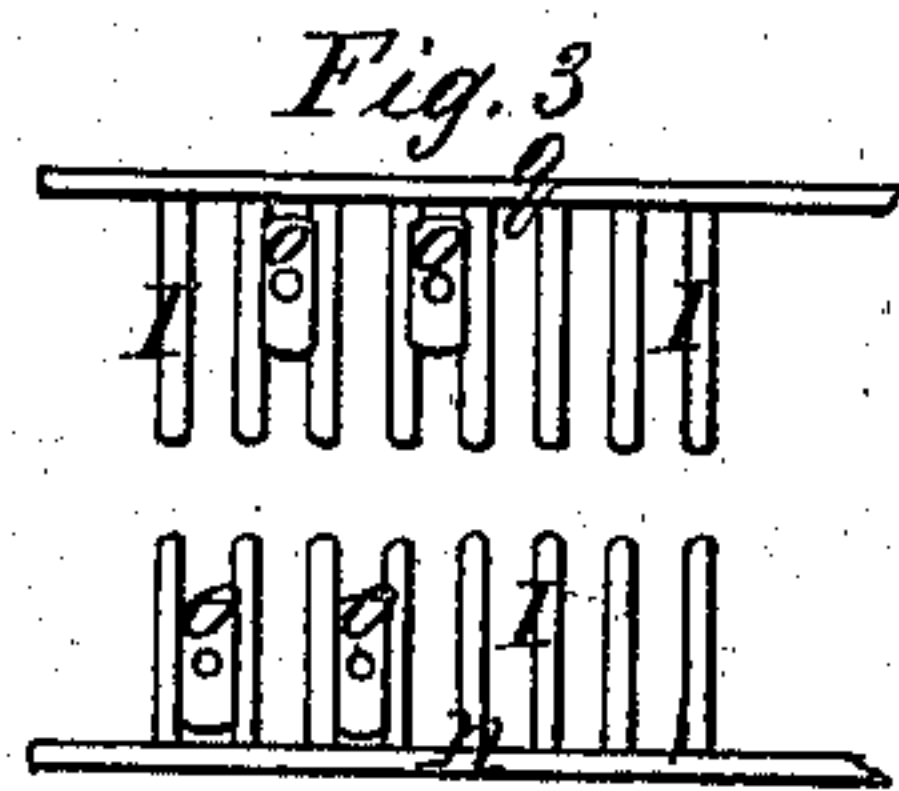
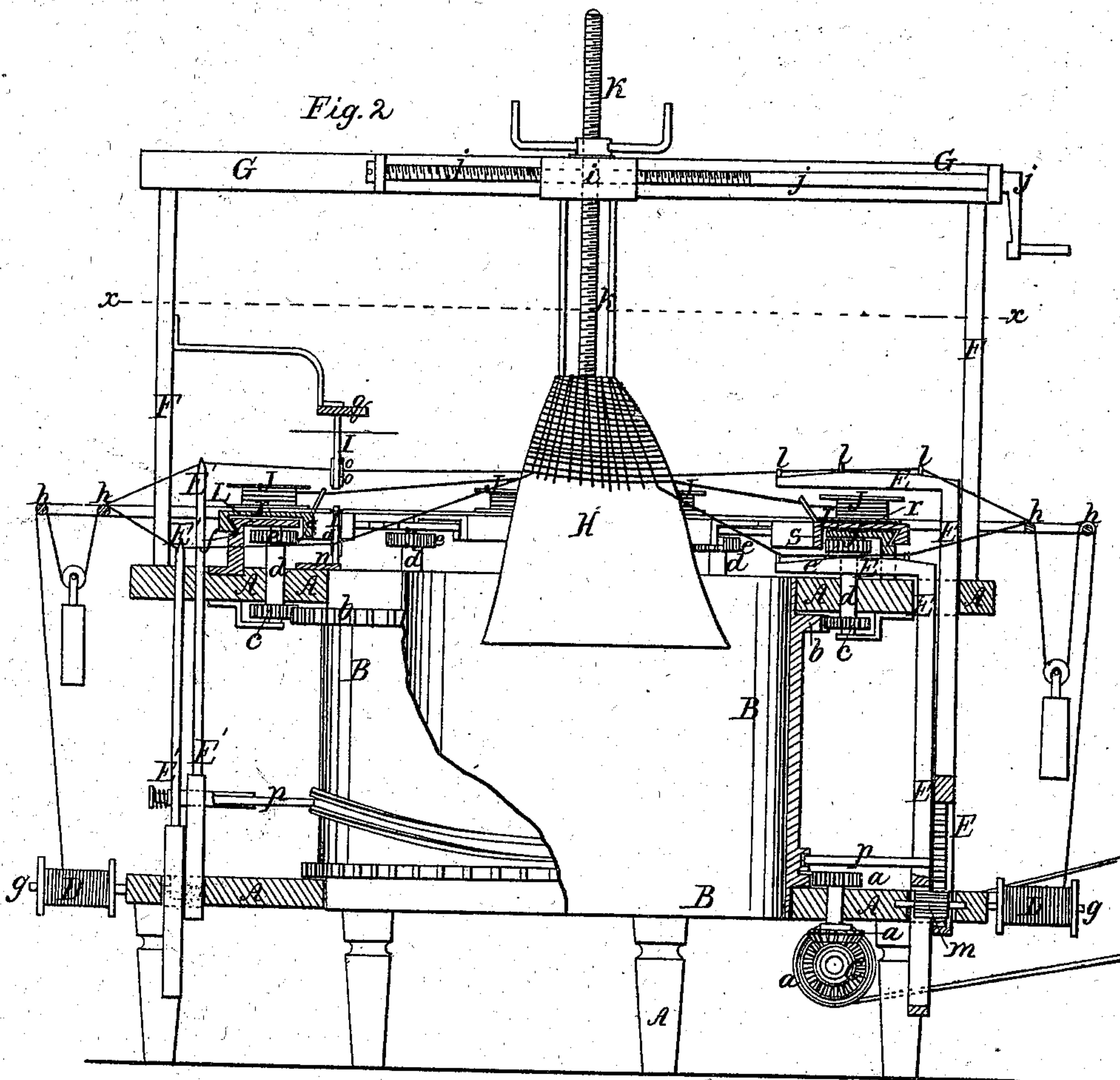
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OF SAME PLACE.

*Letters Patent No. 81,438, dated August 25, 1868.*

## IMPROVEMENT IN LOOM FOR CIRCULAR WEAVING.

*The Schedule referred to in these Letters Patent and making part of the same.*

### TO ALL WHOM IT MAY CONCERN:

Be it known that I, ADOLPH WAGNER, of the city, county, and State of New York, have invented a new and improved Weaving-Machine; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same. reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1, sheet 1, represents a horizontal sectional view of my improved weaving-machine, the plane of section being indicated by the line *x x*, fig. 2.

Figure 2, sheet 2, is a vertical central section of the same.

Figure 3, sheet 2, is a detail side elevation of the warp-carrier.

Figure 4, sheet 2, is a detail side elevation of the gears for raising and lowering the warp-carriers.

Similar letters of reference indicate corresponding parts.

This invention relates to an improved machine for weaving hoop-skirts and other fabric of tubular or irregular shape, but is more particularly intended for the manufacture of petticoats and hoop-skirts.

The invention consists principally in the use of a circular machine, in which the fabric is woven around a block, suspended between the warp-carriers and the track of the shuttles, said block being up-and-down as well as laterally adjustable, so that it may always be adjusted centrally between the shuttles, howsoever irregular its shape may be.

The shuttles move on a circular, oval, or irregular endless track, and deposit their wool-threads alternately above and below a warp-thread around the aforesaid block.

The warp-carriers receive an alternate up-and-down motion by means of a cam, which is arranged on the outside of a revolving drum, by which drum also the shuttles receive their motion.

The warp-threads have to be spread, so as to have them equidistant from each other around the block. For that purpose the carriers have horizontal extensions, which are diverging, like spread fingers, so that the desired effect is produced, and the desired distance between the warp-threads obtained, without requiring the spreading of the carriers, which are arranged in groups of six, or more or less. To diminish friction in the operation of the carriers, such grouping is necessary, as otherwise each carrier would require its own connection with the cam on the drum.

The cam only operates one set of each group of carriers, and the carriers, which are thus alternately raised and lowered, impart, by means of gearing or otherwise, motion to the other set of carriers, so that the same always moves in the opposite direction with the first-named set.

The operation of the machine, and the details of its construction, will more fully appear from the following description, in which reference is had to the drawings.

A, in the drawing, represents the frame of my improved weaving-machine.

The frame is of suitable size and material, and carries a vertical drum, B, to which rotary motion can be imparted by means of gear-wheels *a a*, from a driving-shaft, C, or by any other suitable mechanism.

On the drum B is mounted a toothed ring, *b*, which imparts motion to a series of pinions, *c c*, that is mounted on vertical arbors *d d*, which have their bearings in the frame A, and which carry pinions *e e* on their upper ends, as is clearly shown in figs. 1 and 2.

The upper ends of the arbors *d d* and the pinions *e e* are protected by covering-plates *f f*, which are attached to the frame A, as is clearly shown in fig. 2.

To the lower part of the frame A are secured horizontal bars *g g*, which form shafts for bobbins D D, upon which the warp-threads are wound. These threads are placed over rails *h h*, and through loops in carriers E E, by which they are held the required distance apart.

From the frame A project two uprights F F, between which a cross-bar, G, is held. In this cross-bar is arranged a nut, *i*, which is longitudinally adjustable in the bar G, either by means of a screw, *j*, or otherwise.



Through the nut *i* is fitted a vertical screw, *k*, from the lower end of which a block, *H*, is suspended. This block forms the core of the fabric to be woven, and is of the required shape.

The ends of the warp-threads are fastened to the upper or lower end of the block *H*, and it is necessary that the warp-threads should all be equally far apart from each other. For that purpose the carriers *E* should be also equally far apart.

As the woof-threads have to pass between the warp-threads, as the latter have to be alternately raised and lowered to form the required netting in the fabric, and as, therefore, the warp-threads must be able to play below as well as above the shuttles of the woof-threads, and as, finally, the said woof-threads are about on a plane with the pinions *e*, it is necessary that the warp-threads should be able to play higher and lower than the pinions *e*. As the latter are covered by plates *f*, the warp-threads could not be moved down, if they were distributed equally far apart over the whole frame *A*. Therefore the warp-threads have to be collected in the spaces which are between the several plates *f*, and must then be distributed as desired.

The warp-thread carriers *E* are L-shaped bars, their vertical arms being toothed, as shown, while their horizontal arms have loops *ll*, for the warp-threads to pass through. All the horizontal arms of the carriers which are grouped together between every two plates, *ff*, are secured to two upright arms, so that, if there are six carriers between two plates, *f*, three project from one, and the others from the other, upright arm, as is clearly shown in the drawing; or each horizontal arm projects from its own upright arm, but three of the latter are connected at their lower ends, as indicated in fig. 4.

The lower parts of the upright arms of the carriers are toothed, as shown; and of the two uprights which support a group of carriers, one is toothed on the right, and the other on the left-hand edge, as is clearly shown in fig. 4.

The two uprights of one group mesh with their teeth into a pinion, *m*, as shown, and one of the uprights has a pin, *p*, which fits into a cam-groove that is arranged around the rotary drum *B*, as in fig. 2, or is otherwise connected with a cam-rail or groove on the drum, so that it is alternately raised and lowered during the revolutions of the drum.

By being connected, by means of the pinion *m*, with the other upright, the moved carrier imparts motion to the other carrier, but in opposite direction, so that one moves up when the other moves down, and *vice versa*, and thus each half of the carriers between every two plates, *f*, moves simultaneously with the other half, but in the opposite direction.

The horizontal arms of the carriers *E* of each group are interposed between each other in such a manner that always one of one stem is next to one of the other stem, and thus, throughout the whole machine, each warp-thread is moved up while the warp-threads adjoining it move down, and down when they are moved up.

The threads are distributed equally far apart, by bending the horizontal arms of the carriers, so that the desired effect is produced between the pinions *e* and the block *H*, as is clearly shown in fig. 1.

In place of the carriers *E*, when they are arranged as described, another device may be employed. In this the carriers would only consist of upright arms *E' E'*, fig. 2, arranged in groups, like the others, and half of each group connected at the lower end, and by means of a pinion, *m*, with the other half, and by the pin *p* with the drum, as shown.

The warp-threads are drawn through loops in the upper ends of the reciprocating stems *E'*, as shown, and are then separated and distributed or spaced, as required, by being drawn through sliding blocks *o o*, which fit between upright bars *I I*, so that they can easily move up and down between the same. As these bars are in the way of the woof-threads, there has to be a space provided for the woof to pass through, and for that purpose the bars are separated in about the middle, as in fig. 3, their respective parts projecting upward from a plate, *n*, and downward from an upper plate, *q*, as shown.

The spaces between the two parts of each bar, *I*, are not too long, so that the blocks may not slip out of their places while they move up and down with the carriers *E'*, with which they are connected by means of the thread.

The woof-threads, which may be wire or steel springs, similar to those used in hoop-skirts, or silk or other threads, are wound around bobbins *J J*, which turn on pins *r r*, that project from shuttles *L*.

The shuttles are metal plates, with toothed downward projections *s s*, of such length that each shuttle always meshes into at least one of the pinions *e*, as shown in fig. 1.

Thus, as the drum *B* rotates, the pinions *e* will also revolve, and thereby the shuttles *L* will be moved upon the plates *f*, around the block *H*, and will deposit their threads around the block *H*, as shown.

The woof-threads receive the proper tension by means of springs *t t*, which press against the bobbins *J*, as shown.

The operation will be easily understood.

The block *H* remains stationary during the revolutions of the drum *B*, except that it is adjusted up or down to the required height, which may be done automatically, by connecting the screw *k* with suitable mechanism for that purpose. The block *H* is also adjusted horizontally, by moving the nut *i* on the bar *G*, so that that portion of the said block which is receiving the threads may always be kept equidistant from the shuttles, and as near as possible concentric with the drum *B*.

Each woof-thread is, as it passes through the warp-threads, laid alternately over and under a warp-thread, as is indicated in fig. 1.

This machine may also be employed for weaving other than endless fabric, by imparting to the shuttles a reciprocating instead of an endless motion.

The pin *p* may be made sliding on the carrier-stem, as shown, so that any one group of carriers may at once be thrown out of gear, whenever desired.



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

1. A circular-weaving machine, in which the core or block II is vertically as well as horizontally adjustable, substantially as described, so that tubular, as well as irregular-shaped, fabric may be produced, as set forth.

2. The device herein shown and described, for imparting reciprocating motion, in opposite directions, to the two sets of carriers, E or E', which compose a group, said device consisting of the pin *p*, cam on the drum B, and pinion *m*, in combination with the toothed carrier-stems, substantially as and for the purpose herein shown and described.

3. The carriers E' E', when arranged in combination with the upright bars I I and sliding blocks *o o*, the bars I I being divided in the middle, as set forth, to allow the passage of the woof-threads, as specified.

4. The carriers E E, when provided with diverging horizontal arms, substantially as set forth, for the purpose of distributing the warp-threads, and of allowing the grouping of the carriers between the pinions *e e*, as herein described.

5. The carriers E or E', when arranged and operating as described, the shuttles L L, when made as described, and the up-and-down as well as horizontally adjustable block H, all in combination with each other and with the rotary drum B, and all made and operating substantially as herein shown and described.

6. The sliding pins *p*, in combination with the carrier-stems, substantially as and for the purpose shown and described.

The above specification of my invention signed by me, this 14th day of January, 1868.

ADOLPH WAGNER.

Witnesses:

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