Sheet 1-4 Sheets.

S. T. Thomas.

Weaving Bags.

No. 14,746. Patented Apr. 22, 1856.

Fig. 1

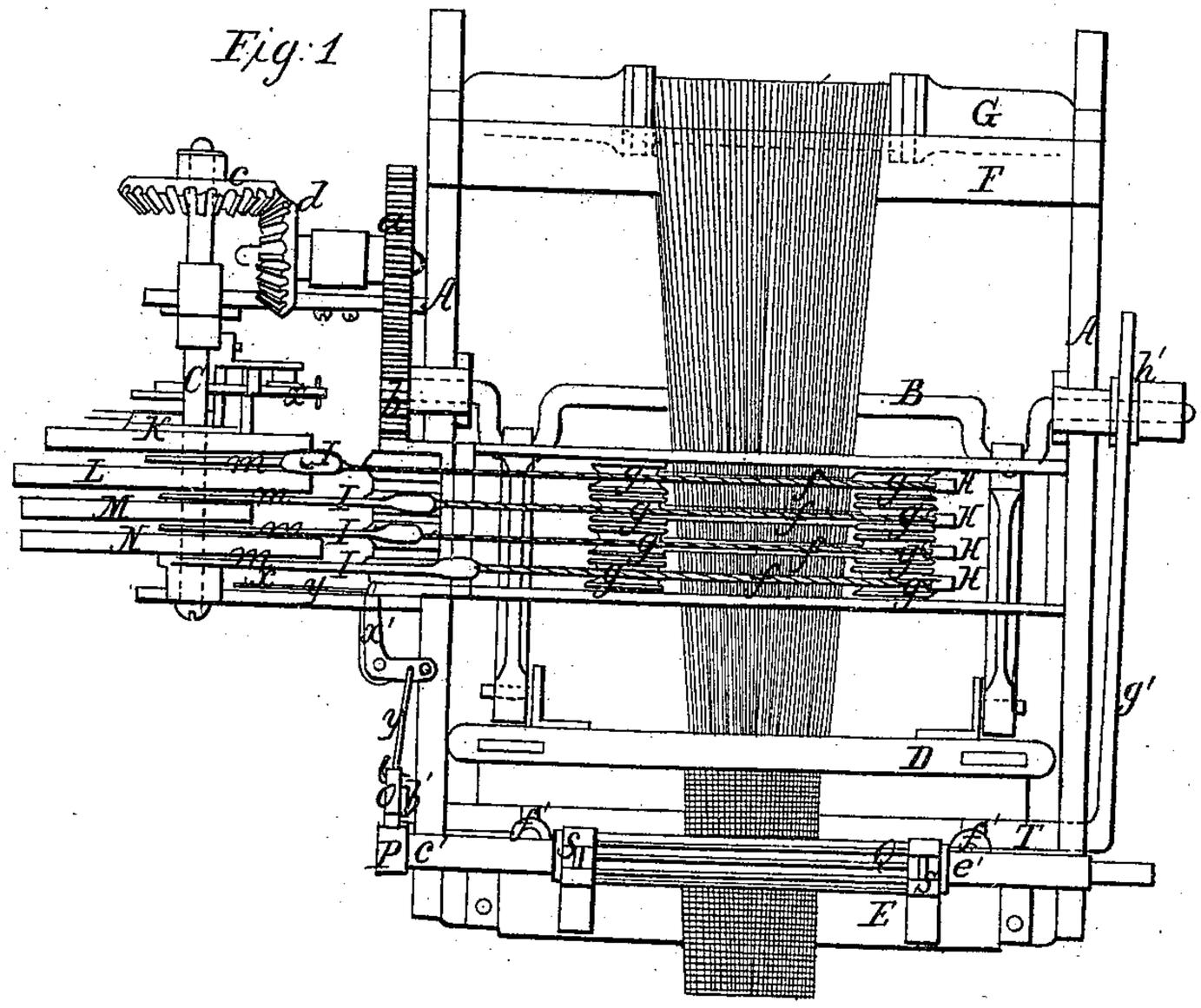

Fig. 2.

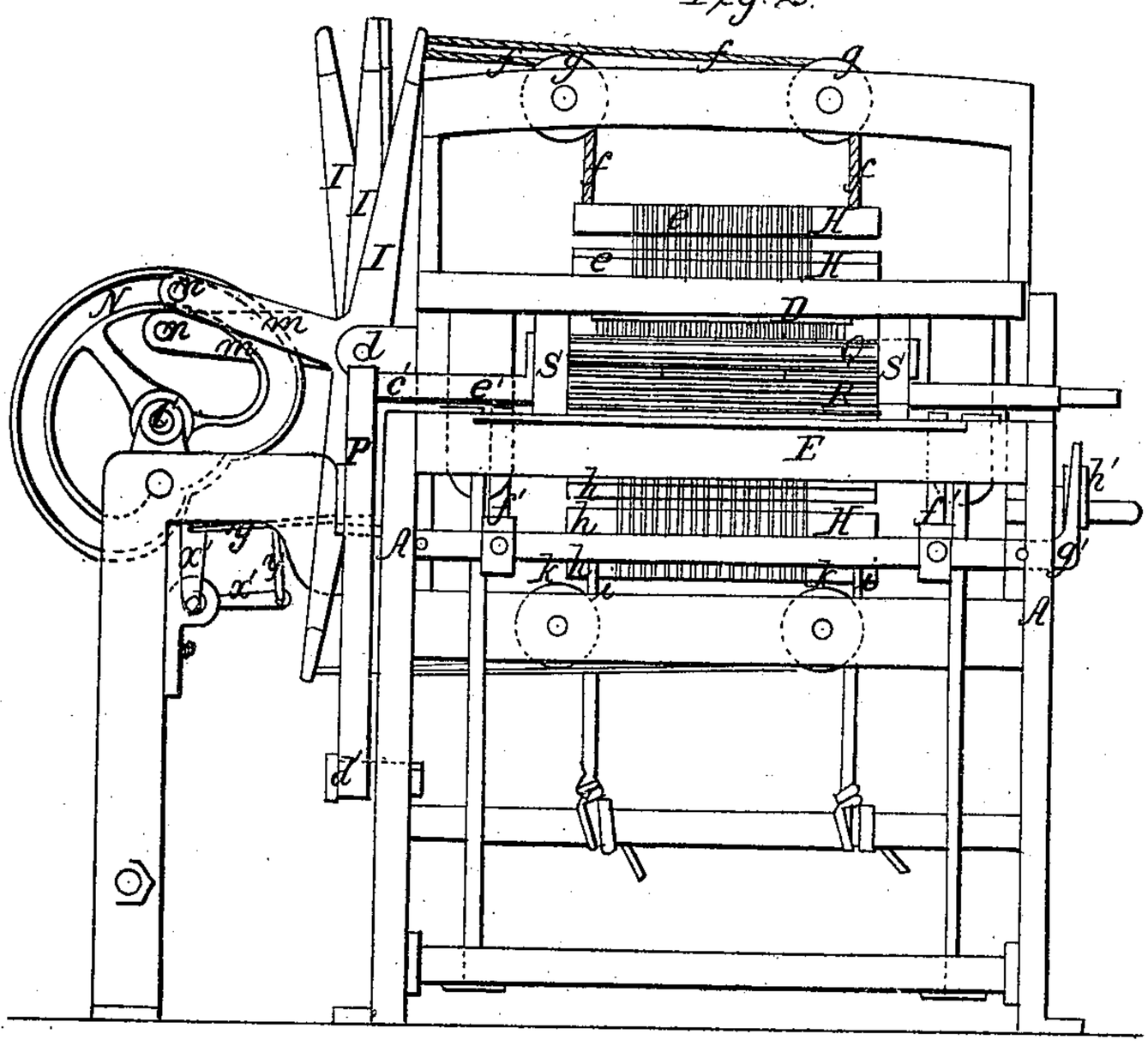

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Fig: 3.

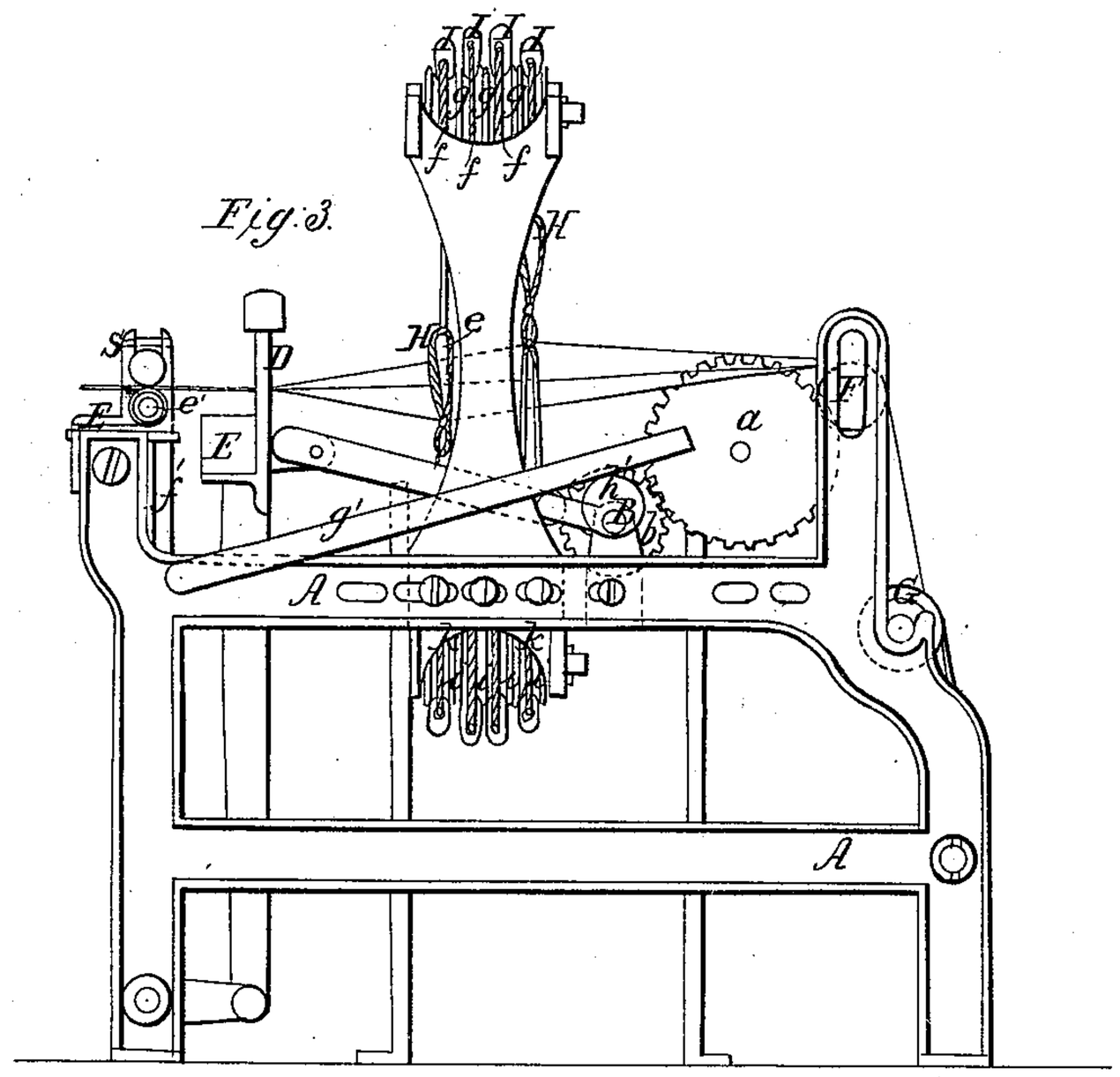
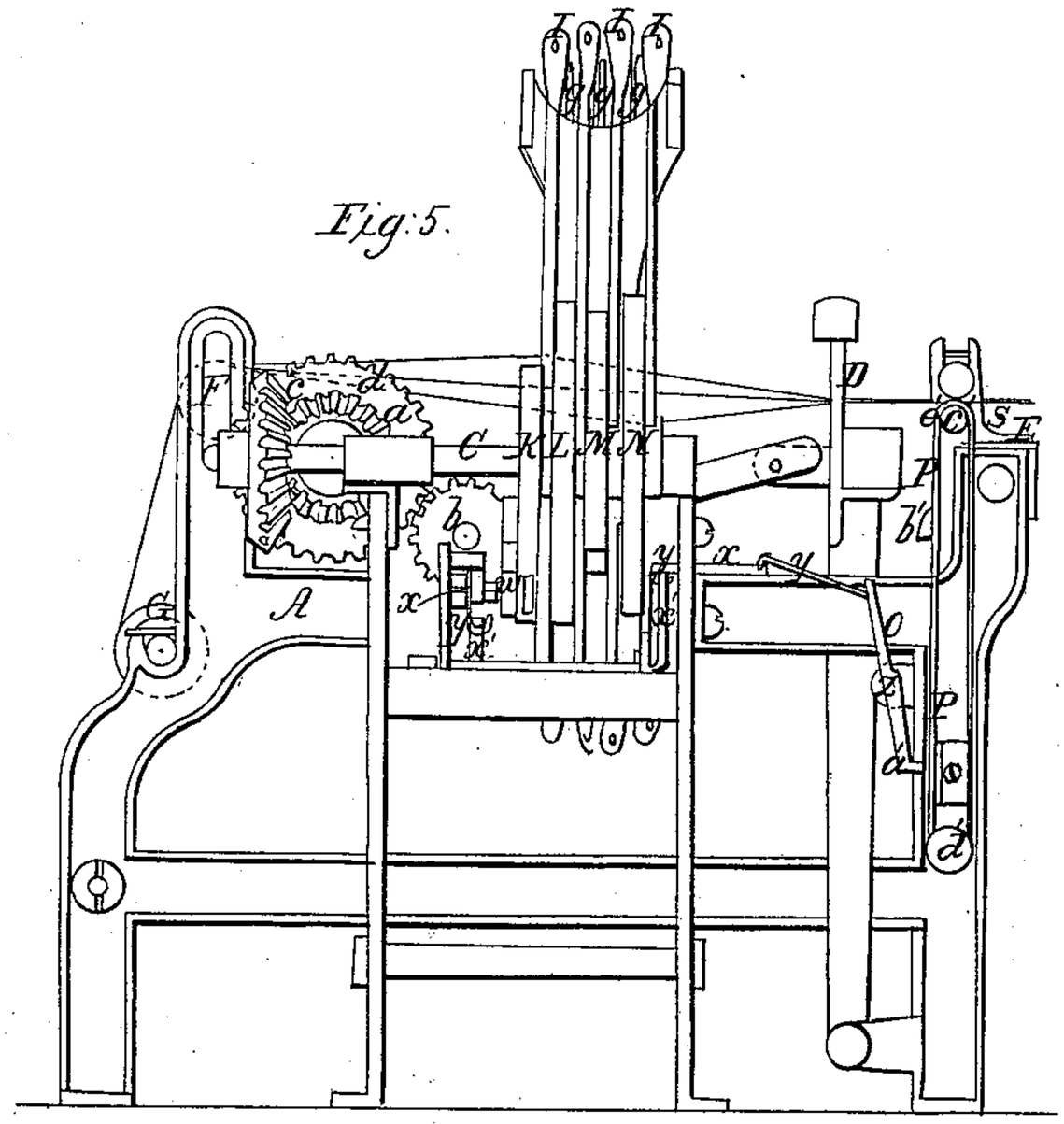


Fig: 5.



Sheet 3-4 Sheets.

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Fig. 4.

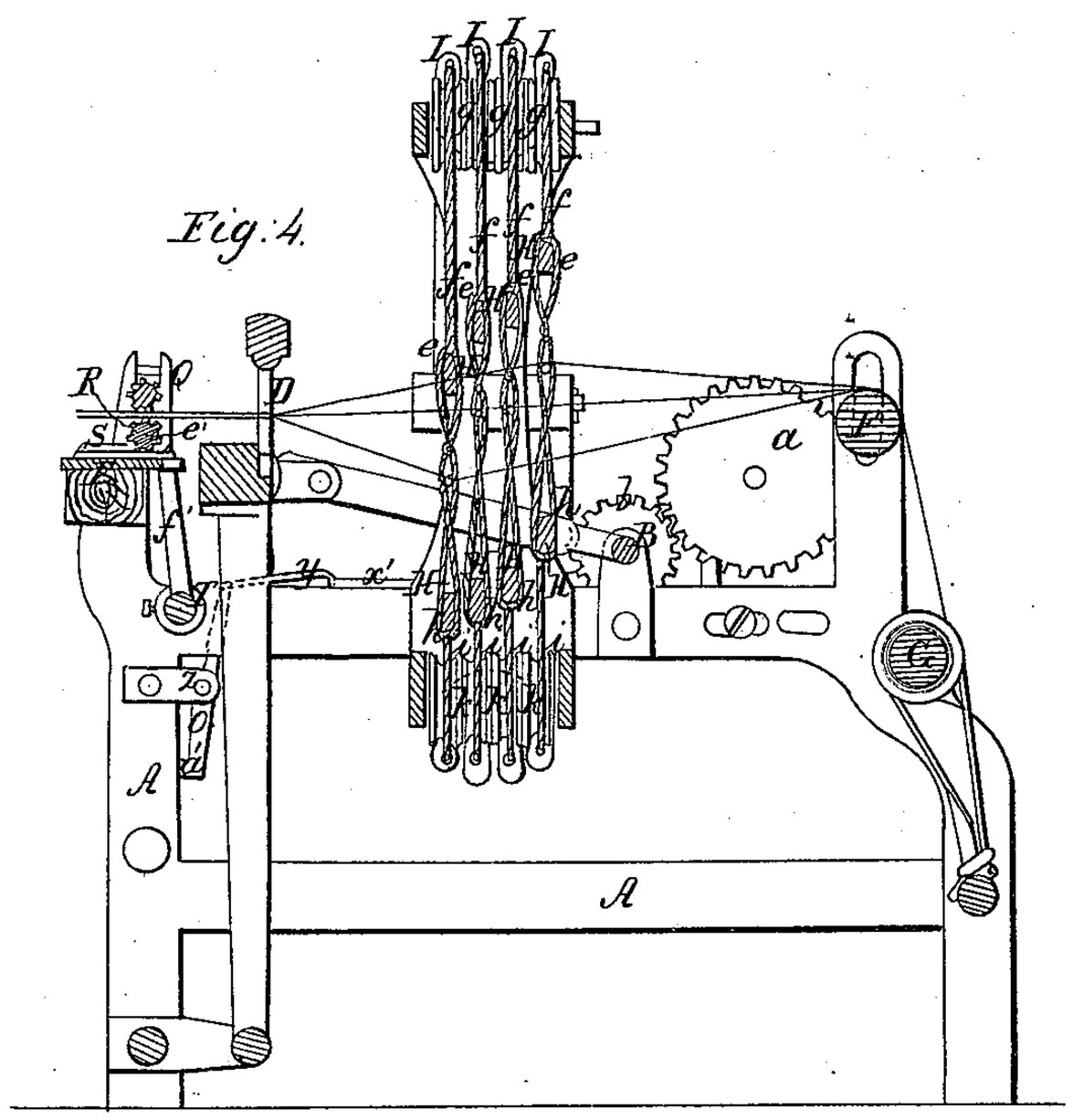
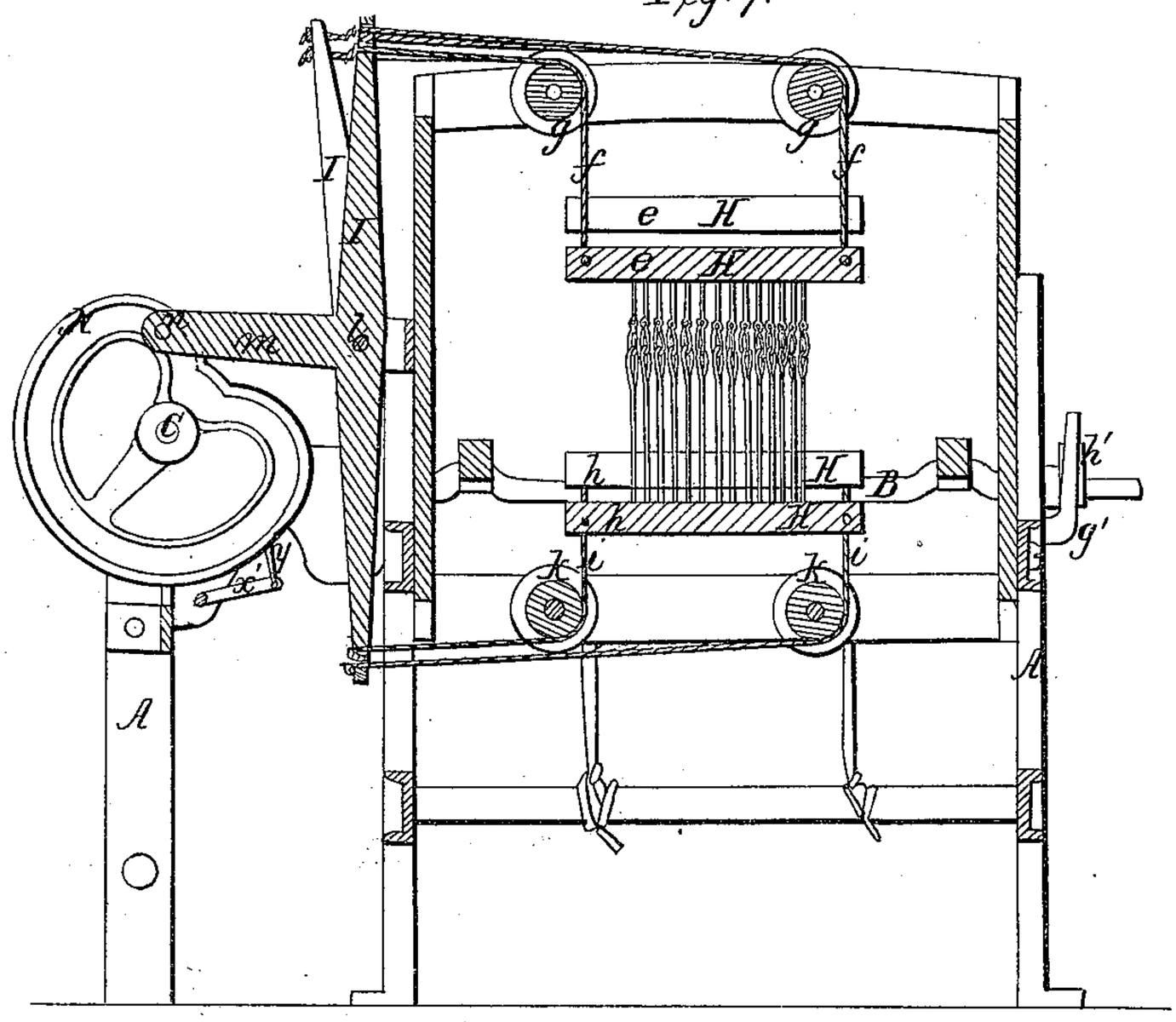


Fig. 7.



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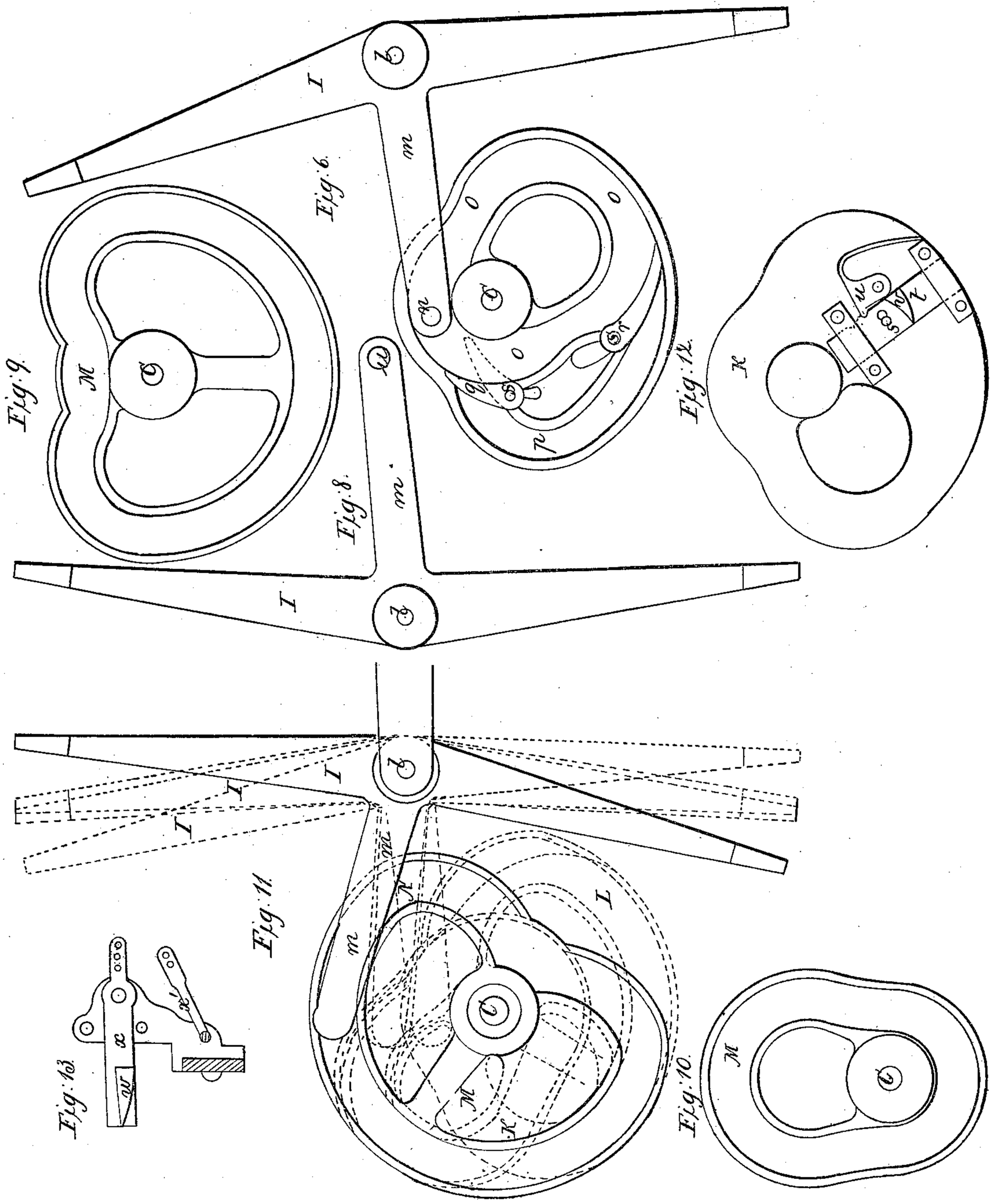

UNITED STATES PATENT OFFICE.

SAMUEL T. THOMAS, OF LAWRENCE, MASSACHUSETTS.

LOOM FOR WEAVING BAGS.

Specification of Letters Patent No. 14,746, dated April 22, 1856.

To all whom it may concern:

Be it known that I, SAMUEL T. THOMAS, of Lawrence, in the county of Essex and State of Massachusetts, have invented an Improved Loom for Weaving Bags; and I do hereby declare that the same is fully described and represented in the following specification and the accompanying drawings, of which—

Figure 1, exhibits a top view of it; Fig. 2, a front elevation of it or one taken so as to show the breast beam side of the loom. Fig. 3, is an elevation of the right end of the loom. Fig. 4, is a vertical central and longitudinal section of the loom. Fig. 5, is an elevation of left end of the loom. Fig. 6, an inner side view of the compound cam K, and its tripping lever, to be hereinafter described. Fig. 7, is a vertical and transverse section of the loom. Such other figures as may be necessary to a full and complete delineation of the parts constituting my improvement or invention will be herein after referred to.

In the said drawings A, exhibits the frame of the machine, B, its main driving shaft; C, the cam shaft; D the lay; E, the breast beam; F, the yarn beam; G, the yarn roller; and H, H, H, a series of harnesses; such being the component or principal parts of an ordinary loom. The cam shaft is arranged with respect to the main driving shaft as seen in Figs. 1 and 5, and receives motion from it by means of a set of spur gears, *a*, *b*, and a set of bevel gears *c*, *d*, arranged as seen in said figures.

The top bar *e*, of each harness is sustained by two vertical cords, *f*, *f*, which depend from and work partially around respectively two pulleys or sheaves, *g*, *g*, the cords being extended horizontally from their respective pulleys, and attached to the upper arm of one of a series of triarmed levers I, I, I. The lower bar *h*, of each harness, (see Fig. 7,) has two cords *i*, *i*, extended down from it vertically, and underneath two vertical guide pulleys or sheaves *k*, *k*, and thence horizontally to the lower end of the triarmed lever I, the cords then being fastened to said lever. The series of triarmed levers is disposed and made to operate on one common fulcrum or pin, *l*, which is arranged as seen in Fig. 2, the middle arm *m*, of each triarm lever having a stud or roller *n*, extending from it as seen in Fig. 8 (which is a view of the rear side of a triarm lever) and made to enter the groove of one of a series of grooved cams K, L, M, N, Fig. 9, is a side view of either of the two cams L and N, while Fig. 10, is a side view of the cam M, they with the compound cam K, being disposed upon the cam shaft C, in a proper manner and with respect to one another as exhibited in Fig. 11, wherein the cam N, is shown by the black lines, the cam M, by blue lines, the cam L, by red lines and the compound cam K, by black dotted lines.

The compound cam K, is intended to be employed not only in connection with the other cams for producing the weaving of the sides of the bags, or tubes, but it, also, by means of the addition which is made to it, is used for effecting the operation of "bottoming" or connecting together the sides of the bag or tube. For this purpose the cam is formed with a main track or groove *o*, *o*, *o*, see Fig. 6, and also a sideling or secondary track *p*, to both of which at their places or angles of junction are respectively applied two movable tongues or switches *q*, *r*, which are capable of being moved into positions as exhibited by the black and dotted lines in Fig. 6, and so as to turn the stud of the triarmed lever, which works in connection with the compound cam from the groove *o*, into the sideling groove *p*, as well as from the latter into the former as occasion may require. When the switches are turned across the sideling groove *p*, they prevent the stud of the lever from passing into the same and while the stud is moving in the groove *o*, the sides of the bag are being woven. When however the switch *r*, is turned so as to cause the stud to pass into the sideling *p*, the harness connected with the triarmed lever of the compound cam will be so operated with respect to the others that the bottoming of the bag will be performed. Such bottoming is effected by interweaving the two sets of warps in the manner well known to bag weavers.

In bag weaving two warps compose a set, they being required to form a "side" of the bag. As the bag has two sides it being made as a flat tube, two sets of warps become necessary. When they are interwoven in order to form the "bottoming", three of the warps are simultaneously raised or lowered, while the remaining warp is lowered or raised with respect to them so

as to form a "shed" or angle of decussation for the passage of the shuttle containing the weft. The manner of weaving the sides of the bag by two sets of warps and one shuttle as well as the manner of interweaving the sets is essentially the same in my loom as in other looms for tubular or bag weaving.

The apparatus or mechanism for operating the switch r is as follows. The said switch is a lever turning on a fulcrum or pin s, its shorter arm being jointed to a slide t, arranged on the rear side of the cam K, as seen in Fig. 12, (which is a rear side view of the cam K,) said slide being made to move either toward or away from the hub or shaft of the cam and held in either of its two positions by a spring catch u, (see Fig. 12.) A wedge or cam v, is affixed to and made to project from the slide t, the said part v, being intended to operate in connection with a similar wedge or cam w, of a tripping lever or cam x. In Fig. 13 is represented a view of lever x, and its cam w. This last lever, by means of a series of connecting rods y, y, y, and intervening levers x', x', x', (see Figs. 1 and 2) is connected with a lever o, arranged upon one end of the frame of the loom as seen in Fig. 5, the said lever o, turning on a fulcrum z, and having a stud a', projecting from its lower end and toward an endless belt or chain P, which carries a cam b', and works around two rollers c', d'. The upper of these rollers viz. c', is fixed upon or forms part of the shaft e', of the lower or breast roller of a set of two take up or draft rollers Q, R, arranged on the breast beams as seen in the drawings.

I have not delineated the mechanism usually employed for operating the take up or draft rollers which receive the cloth or bagging and move it in a direction away from the lay as fast as it may be woven, my invention having no direct reference to such mechanism. The movement of the lower draft roller will give motion to the endless belt P. When the cam b', of said endless belt is moved into contact with the stud a', of the lever o, it will move said lever so as to produce the elevation of the tripping lever x, and to such extent as to carry its cam into the path of that of the slide t. Under these circumstances, and during the rotation of the cam K, when the cam of the slide t, is brought around against the cam of the tripping lever, such slide will be moved so as to throw the switch r, across the groove, o, in such manner as to cause the switch r, to turn the stud of the triarmed lever I, of the cam K, from the groove o, into the sideling groove p. While the stud of the triarmed lever is passing from the sideling p, into the groove o, the switch q, extends across the groove o, so as to prevent the stud from being turned out of its proper course. So, while the stud should be maintained in the groove o, the switches will prevent it from passing into the sideling. As soon as the cam b', has passed by or beyond the stud a', of the lever o, the lever x, will be free to move into a position (and will be so moved by its weight) to again move the slide t, (viz, in the opposite direction to which it was last moved) when the cam K, moves the cam v, into contact with the cam "w" of the lever x. Thus the switch r, will be moved back or across the groove p so as to cause the stud n, to travel in the groove o.

From the above it will be seen that the mechanism for forming the bottom or bottoming of a bag is very simple in its construction and mode of operation, and, that by varying the length of the endless band or chain P, we can vary the length of the bag to be woven.

The stand s, by which the draft rollers are supported should be arranged upon the breast beam E, in such manner that it may be capable of being moved transversely thereon both toward and away from the lay. Such stand is jointed to two upright arms f, f, extending from a rocker shaft T, (see Figs. 1, 2 and 4). The right hand end of said rocker shaft, has a long arm g', projecting from it and resting upon a cam h', carried by the main driving shaft B, see Figs. 1 and 3. The object of the mechanism just described is to produce such a movement of the draft rollers as will preserve a uniform tension on the warps during the movements of the harnesses; the cam h', being so formed as to impart to the lever or arm g', such a degree of movement as will move the stand s, either toward the lay or away from it, as occasion may require. In a similar manner, or by mechanism substantially as described a common breast beam or a plate or bar thereon may be moved, such movable breast or plate being a mechanical equivalent or substitute in some respects for the lower draft roller above described.

In order to maintain a uniform tension on the warp it has been customary in looms to apply to the yarn roller G, a mechanism by which such may be moved laterally in order either to loosen or tighten the warps as occasion may require. By my improvement I dispense with all such apparatus so applied to the roller G, and I maintain such roller stationary with the exception simply of allowing it to rotate on its axis. I arrange and apply the tension apparatus or mechanism to the opposite side of the loom or with respect to the breast beam as hereinbefore described, and in so doing I gain important advantages for when the lay beats up, the warps are held firmly by a rigid and unyielding roller or are better supported against the blow of the reed, than they are

when the cloth roller is applied to mechanism which may not only permit it to rotate upon its axis but to move so as to maintain uniformity of tension to the warps such mechanism generally speaking being more or less elastic and liable to give away or yield under the blows of the reed against the filling or weft. Other important advantages attained by my arrangement might be enumerated, but the above I deem sufficient to exhibit the utility and importance of it.

Having thus described my improved loom what I claim therein is as follows:

1. I claim in combination with the compound cam K, the endless chair or belt P, and the mechanism for moving the switch *r*, the whole being arranged substantially as above described and for the purpose of determining the length of the sides, or when to form the bottom of the bags as hereinbefore specified.

2. I also claim the arrangement by which uniform tension of the warps is secured during the movements of the harnesses, or in other words I claim combining with the breast roller or beam, mechanism arranged substantially as described by which the breast roller or beam may be moved with respect to the lay or harnesses and during the movements of the latter as specified.

In testimony whereof I have hereunto set my signature this fifth day of Jan'y A. D. 1856.

SAMUEL T. THOMAS.

Witnesses:

JOHN I. CHANDLEE,

AUGUSTUS J. SHOVE.