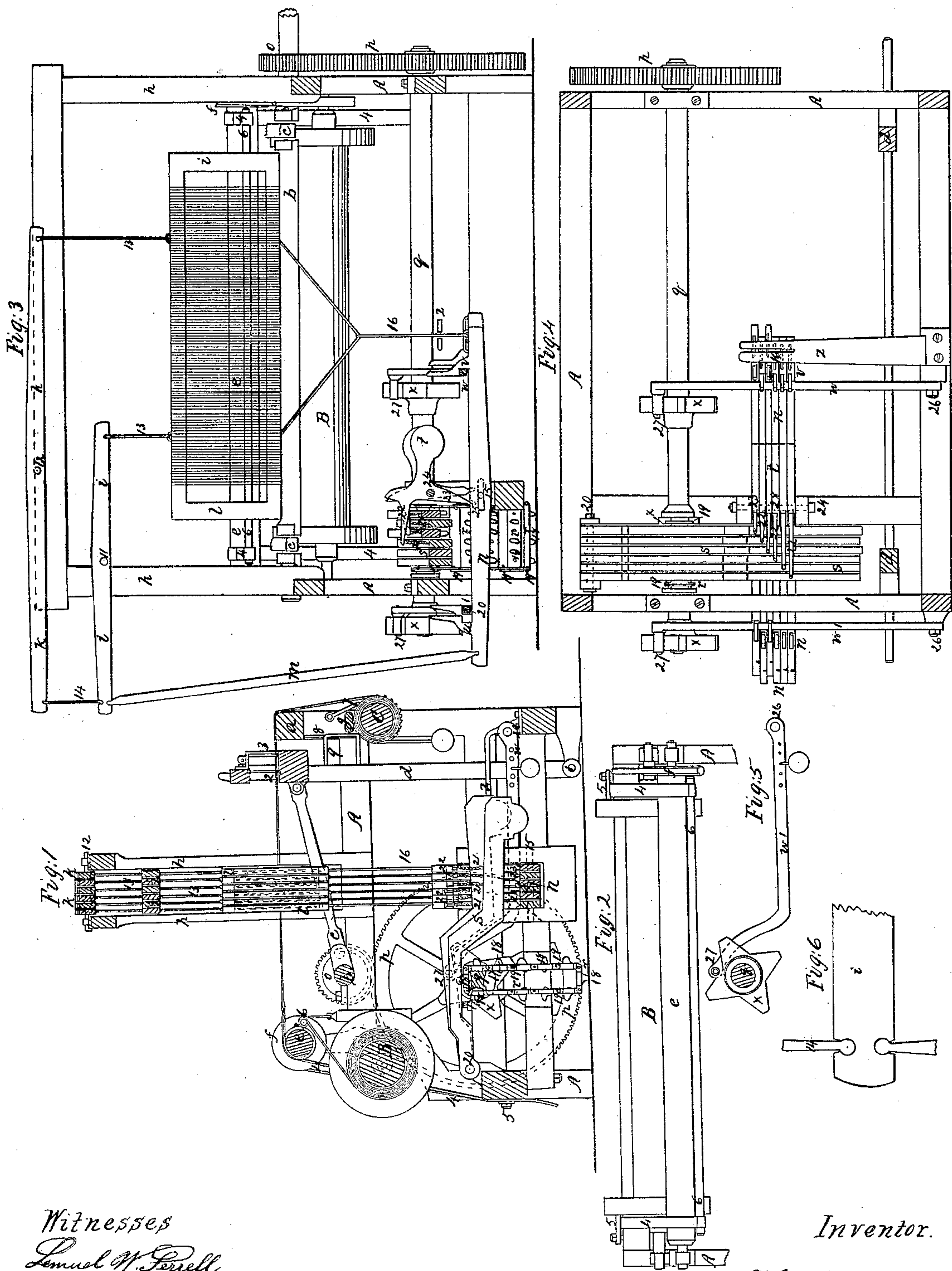


W. Townsend. Loom Shedding.

N^o 10,241.

Patented Nov. 15, 1853.



Witnesses
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WILLIAM TOWNSHEND, OF HINSDALE, MASSACHUSETTS.

LOOM.

Specification of Letters Patent No. 10,241, dated November 15, 1853.

To all whom it may concern:

Be it known that I, WILLIAM TOWNSHEND, of Hinsdale, Berkshire county, State of Massachusetts, have invented, made, and applied to use certain new and useful Improvements in Looms for Weaving; and I hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawing, making part of this specification, wherein—

Figure 1, is a longitudinal section of the loom; Fig. 2, is a plan of the whip roller and yarn beam, Fig. 3, is a cross section through the heddles and treadles, Fig. 4, is a plan of the treadles that work the heddles, and Fig. 5 is an elevation of the side levers.

The like marks denote the same parts.

The nature of my said invention consists in the use of levers connected to the heddles and so set on slotted fulcrums that they receive an endwise motion from the pattern chain or similar means, to connect said levers near either one end or the other with cross levers, to be carried up by such levers, and either elevate or depress the heddles according to which end of said sliding lever is elevated.

A, is the frame of the loom made in any usual manner.

a, is the breast beam. *b*, the driving shaft to which power is applied through an auxiliary shaft with a stop motion as now practiced; on the shaft *b*, are cranks, receiving pitmen or connecting rods *c*, to the lay *d*, which vibrates on the rock shaft 1, and is fitted with the reeds 2, shuttle box 3, and with any ordinary picking motion to throw the shuttle as now usual.

B, is the yarn beam on journals in the frame A.

e, is the whip roller, set in adjustable bearings as usual. Heretofore the warp has been passed directly over the whip roller from the yarn beam, friction or other power being applied to the yarn beam, or a definite feeding motion given by the whip rollers. But to accomplish the object of holding the yarn back with a regulated amount of strain, I place a bar or rod *e* the length of the whip roller or nearly so, behind the yarn as it passes from the yarn beam over the whip roller and draw the bar and warp toward the front of the loom by means of straps 4 attached to the end of the bar 6, passing over the whip roller, and secured by clamps 5, to

the frame. It will be seen that the bar 6 causes the warp to wind almost around the whip roller and the rotation of the whip roller is retarded by the straps 4 that retain the bar 6, and by tightening the straps 4 the bar 6, can be brought around until the warp on the bar 6 nearly touches the warp in the whip roller; thereby the friction is increased, and by slackening the straps 4, the bar 6, will descend and be drawn by the warp toward the back of the machine; thereby there will be less friction on the warp and the fabric woven will be proportionately light. If greater friction is required for weaving heavy fabrics, I use a strap passing over a pulley *f*, on one end of the whip roller to which a weight is applied, or a lever and weight as desired.

The yarn passes through the heddles and by them receives the proper motions, the cloth being woven and passed over the breast beam as now usual. In the drawing the loom is represented as fitted to weave figured work but my "let off" motion can be applied equally well to any character of loom.

The take up motion shown in the drawing consists of a bar or rod *g*; above the cloth beam C. sustained by guides 8, and fitted with straps or an apron to a weight 10; the rod being shoved forward by staples 9 on the lay swords, the friction of the straps or apron rotating the cloth beam, as specified in a previous application for Letters Patent. 7 is a ratchet wheel and pawl to hold the slack taken up by rotating the cloth beam.

On the side frames A. is the head frame *h*, formed double as shown and receiving on one side near the top, between the frames, a series of levers *i*, corresponding in number with the number of heddles used; these levers *i*, are on a fulcrum 11. A similar number of levers *k*, on a fulcrum 12, are placed above the levers *i*, between the cross pieces of the head frames *h*. These levers *k*, and *i*, are connected at their outer ends by means of suitable rods 14, each of which may be formed with a short cylindrical end setting into a hole through the lever, a notch being left in the upper and lower parts of the levers toward each other, to pass the body of the rod, see Fig. 6. The inner ends of the levers *i* and *k*, are connected respectively to the heddles *l*, by rods 13.

m, *m*, are rods of the desired size which may be made heavy enough to balance the weight of the heddles, connecting the outer

end of each lever i , with its corresponding lever n , beneath the loom. The inner end of these levers n , are connected by a rod and brace 16, to the under side of the heddles l .

15 15, is the fulcrum of the levers n , and the holes in the levers are elongated to form a slot for a purpose hereafter set forth.

The rods 16, pass through a guide z , by which they are kept central and the rods 16, are attached by slides to the levers n , as shown, to allow of the levers sliding on their fulcrum. It will now be seen that the levers i , l and n , move the heddles vertically, and if the levers n , are raised on their outer ends the heddles are depressed, and if raised on their inner ends the heddles are raised.

On the end of the driving shaft b , is a pinion o , gearing to a wheel p of four times the diameter of the pinion on a shaft q , supported on bearings on the frame A. Near one end of this shaft on lugs or ribs 17, receiving and rotating continuously a pattern chain or belt r , formed and connected together as shown by hinges 19, on each end of the plates forming the chain. These plates 25 r , have holes corresponding in number with the number of heddles, and the pattern is to be composed by placing pins or cam shaped pieces 18, in the holes and securing them by a screw or nut. Above and across the pattern chain r , are a series of treadles s , on a fulcrum 20, which treadles are of a sufficient weight to move the parts connected with them by their fall when unsupported by the pins on the pattern chain.

21, are chains straps or rods connecting the treadles s , with the arms 22, of vertical levers 23, that set on a fulcrum 24, and have counter weights t . The lower ends of these levers 23, are formed as at 25, to enter mortises in the levers n . By reference to the plan Fig. 4, it will be seen that the arms 22, increase in length as they are connected to the treadles s , but being farther away from the fulcrum 20, a given amount of lifting motion from the pattern chain produces a corresponding motion at the point 25.

The levers n , are furnished with latch pieces u , and v , formed with or attached onto the levers, the points of which come toward each other.

w and w^1 are levers set on fulcrums 26, on the frame A, a sufficient distance apart that when one latch is over one lever the face of the other latch moves against the side of the lever; the length of the face of the latch being sufficient not to descend below the levers as they move. These levers are extended back and curved up terminating with a pin or roller on the side of each lever setting onto and moved by a pair of four sided cams x , on the shaft q , one placed within the frame the other outside, and properly shaped and timed to give the motions.

65 The operation is as follows: The parts

are so timed that as the lay is receding the pins or cams on the chain r , raise the treadles s , that require to be sustained for properly moving the heddles the next time, some of the treadles being unsupported are ready to drop but cannot do so being suspended by the chain 21, arm 22, and lever 23, connected to the levers n , but the levers n , cannot slide endwise from being hooked over lever w , because the face of the latch u , is against the side of the lever w^1 until the further motion of the parts brings the heddles and levers all even as shown, when the treadles, that are not supported by the pins on the chain r , drop, being sufficiently heavy to overcome the weights t , sliding the levers n , to the right and hooking the latch u , over the lever w^1 , and the treadles that are supported allow their corresponding weights t , to force the levers n , to which they are connected to the left, hooking the latch v , over the lever w . The further rotation of the parts by the cams x , raises both levers w , and w^1 , but one lever w , or w^1 , being connected to one end of some of the levers n , and the other lever w^1 , or w to the other ends of the remaining levers, thereby some heddles are elevated while others are depressed ready for the shuttle to be thrown. By this means it will be seen that the continuous motion of the pattern chain places the parts ready to act before the heddles come level, and the moment this is the case the parts are changed ready to go on moving the heddles for another shed; thus no time is lost in waiting as with an ordinary pattern chain for it to move the parts connected to the heddles, after the heddles come into line; thus the heddles can be made to travel up and down as fast as in ordinary plain weaving. The levers w , and w^1 , may be kept onto the cams x , by means of springs applied near the fulcrum or the proper amount of weight may be added for the purpose, or the rollers may work in a grooved cam instead of that shown.

It will be evident that any number of treadles and heddles may be used as the levers w , and w^1 , give greater motion to the heddles as they are farther from the cloth making point, thereby keeping the sheds on a proper and even plane for the shuttle to pass through. It will also be seen that the shaft q , may be given any number of revolutions compared with the shaft b , that may be found convenient, the other parts being made to correspond, and the parts may be applied to any old looms, so as to adapt them to the desired work, the shafts and timing being regulated as convenient. It will also be evident that springs may be used in place of the weights t .

I do not claim the levers w , and w^1 , in themselves as these have before been used; neither do I limit myself to the number of

heddles and treadles, and I do not claim the pattern chain in itself as this is well known; but

5 What I desire to secure by Letters Patent is—

10 I claim the levers n , on a slotted fulcrum with their latch pieces u and v , or their equivalents combined with the levers w and w^1 , by which arrangement the levers n , are connected to either lever w , or w^1 , by means of the end motion, and carried up and down

by competent power applied to the levers w , and w^1 .

In testimony whereof I have hereunto set my signature this thirty first day of De- 15 cember one thousand eight hundred and fifty two.

WM. TOWNSHEND.

Witnesses:

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CHARLES TENCELLENT.