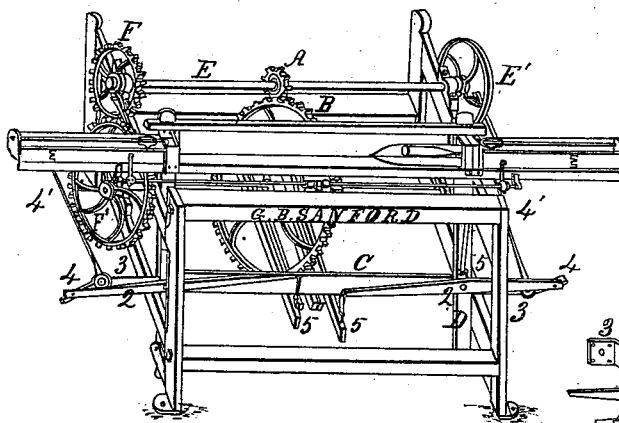


*G. B. Sanford.*  
*Shuttle Motion.*

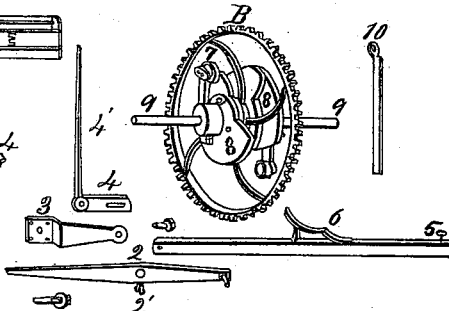
*N<sup>o</sup> 3,005.*

*Patented Mar 17, 1843.*

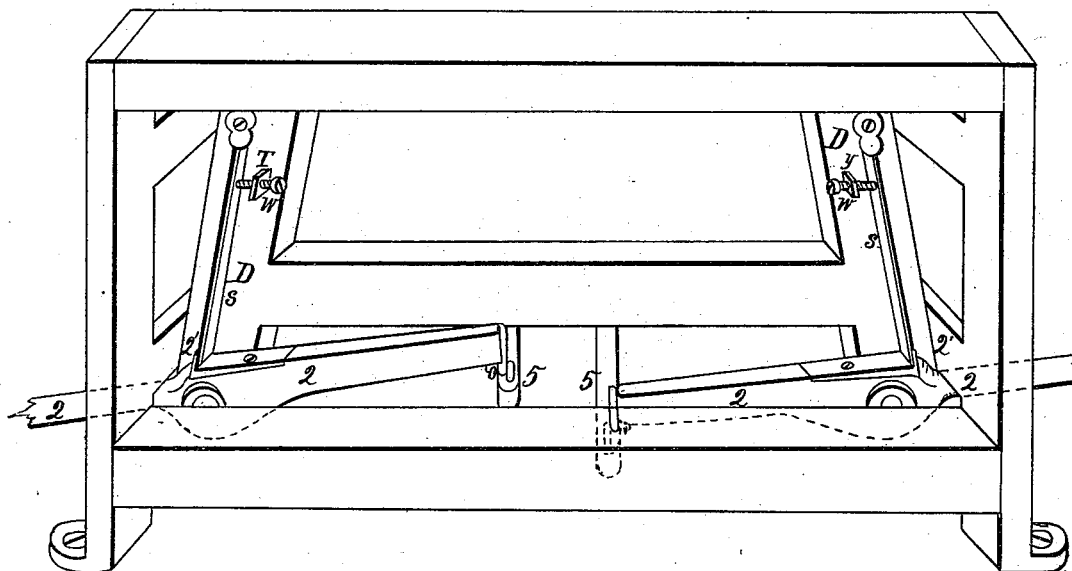
*Fig. 1.*



*Fig. 2.*



*Fig. 3.*



# UNITED STATES PATENT OFFICE.

GEO. B. SANFORD, OF PUTNEY, VERMONT.

## POWER-LOOM.

Specification of Letters Patent No. 3,005, dated March 17, 1843; Antedated October 31, 1842.

*To all whom it may concern:*

Be it known that I, GEORGE B. SANFORD, of Putney, Windham county, State of Vermont; have invented a new and useful Improvement in Power-Looms, of which the following is a full and accurate description, reference being had to the accompanying drawings, making part of this specification.

In its general construction my power loom is the same as the common cashmere loom, my improvement consisting in a new mode of arranging the several parts for producing the shuttle motion, the object of this arrangement being to simplify the construction and give a more lively motion to the shuttle.

No. 1 is a perspective view of the loom deprived of its harness tackle.

E is the main shaft; E', the fast and loose pulley on one end of it; F, the cog or gear wheel on the other end for operating the cam shaft and F' the cog wheel on the end of the cam shaft into which it gears—the whole of this arrangement being the same as in the ordinary power loom.

My first improvement consists in a mode of arranging and operating the harness cams independently of the cam shaft so as to allow of my giving greater speed to the latter than I otherwise could and producing thereby a more lively motion of the shuttles. A section of the cam shaft so constructed is shown under No. 2, *g g* being a section of the cam shaft—7 7 the two shuttle cams fastened to it in the usual way, and 8 8 the two harness cams arranged between them. The harness cams are not fastened to the cam shaft as in the common power loom so as to revolve with it but set loosely upon it; the shaft serving as an arbor for them to turn upon. A gear or cog wheel B to which the harness cams are bolted is arranged between them in the same manner so that the wheel and harness cams revolve together independent of the cam shaft, the cam wheel B receiving its motion from a pinion A on the main shaft E an arrangement which allows of my giving greater speed to the cam shaft and shuttle cams than to those for operating the harness treadles, the gearing being so calculated as to produce this effect, which enables me to give a more lively motion to the shuttle.

The next portion of my improvement is a new mode of arranging the parts by which the shuttle is immediately operated. I dis-

pense with the rocker wag staff and picker straps employed in the common loom and use instead of them what I denominate whip staffs one of which is placed on each side of the loom. These whip staffs are marked 4 4' in the drawing and consist of two parts a vertical rod 4' the upper end of which enters the shuttle box through a slot in the bottom of the lathe having its place behind the picker and of a short arm marked 4 bent outward at a right angle from the bottom of the rod. Each of the whip staffs so constructed is hinged at the point or elbow where the parts 4 4' unite to a horizontal arm of metal marked 3 in the drawing which projects outwardly from the back of each of the swords D of the loom the inner ends of the arms 3 3 being fastened to it near the point at which the connecting girt C and swords D are joined to each other. To operate these whip staffs I employ two horizontal bars or levers of wood or metal 2 2 largest at the middle of their length and tapering from thence to each end—one of these is attached to the front of each sword by a pin passed through its middle into the sword at a point immediately opposite to that at which the arm 3 is fastened the pin answering as a fulcrum for it to move upon. It extends sufficiently far each way to connect with the shuttle treadle next to it on the inside of the loom to which its inner end is fastened by a strap or hinge and with the arm 4 of the whip staff on the outside of the loom to which its outer end is connected by a pin projecting from this end which enters a slot in the arm 4 of the whip staff. When either of the shuttle treadles is depressed the end of the lever attached to it is depressed also, elevating its opposite end so as to force the whip staff in against the shuttle. The lever is elevated again by another arrangement shown in No. 3 which is a front view of the swords D, with the levers 2 2 on a larger scale a straight spring S No. 3 of some inches in length is placed vertically upon each of the swords D immediately above the fulcrum of the lever and is secured by its upper end to the sword, its lower end which is free bearing against the inside of a lip or projection 2' on the upper side of the lever. This spring is forced back when the inner end of the lever is depressed by the shuttle cam acting on the treadle but reacts after the depressing power is removed and restores the lever and whip staff to its first

position. To regulate the bearing of the spring there is a set screw *w* No. 3 adapted to a female screw *y* in the head of a pin which is fastened to the front of each of the  
5 swords about midway the height of the spring. The end of this screw presses against the inside of the spring and by tightening or loosening it the stiffness of the spring may be increased or diminished.

10 As the cam shaft has greater speed in my arrangement than in the ordinary power loom I am enabled to lessen the inclination of the treadle step as the increased rapidity given to the shuttle cams renders a great  
15 inclination unnecessary. The result is that in my loom owing to this combination not only is a more lively motion given to the shuttle, but there is a saving of power in running the loom. At No. 2 a detached  
20 view of the step is given formed in this way, 6 being the treadle step consisting of two inclined planes like those in use with this exception that the plane on the front of the step is less inclined than in the ordinary arrangement and that on the back of the step  
25 is longer and higher behind than in the common loom this change in the construction of the step being made to adapt it to the increased velocity given to the shuttle cams.

Having described my improvement in 30 power looms what I claim as my invention and desire to secure by Letters Patent is—

1. The mode of arranging and operating the harness cams by placing them loosely on the cam shaft and combining with them a  
35 gear wheel B operated by a pinion A on the main shaft E all as herein set forth, this arrangement allowing of my increasing the speed of the cam shaft for the purpose herein referred to. 40

2. I claim the mode of constructing and arranging the parts for producing the shuttle motion. I am aware that a whip staff operated by levers has been employed for  
45 this purpose. This I do not claim therefore, what I do claim is the mode of constructing the whip staffs by making them bent levers as described in combination with the horizontal levers 2 2 and springs S S attached  
50 to the front of the swords the springs being regulated by adjusting screws and bearing against a lip on the levers 2 2 the whole being constructed and operating as set forth.

GEORGE B. SANFORD.

Witnesses:

JONATHAN CUTLER,  
ISRAEL ABBOTT.