May 28, 1957 G. W. DUNHAM 2,793,658

LAY AND PILOT GUIDES

Filed Aug. 31, 1954 2 Sheets-Sheet 1

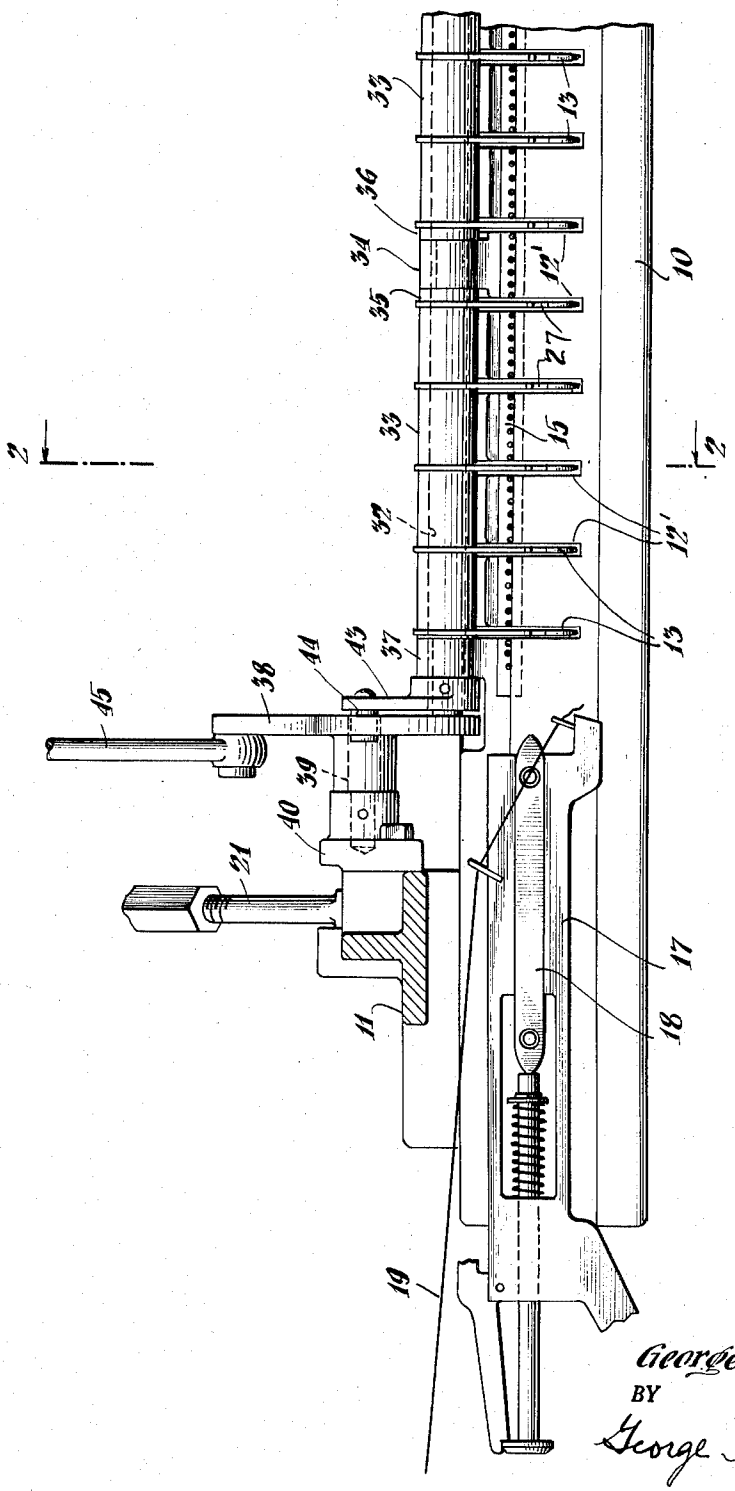


Fig. 1

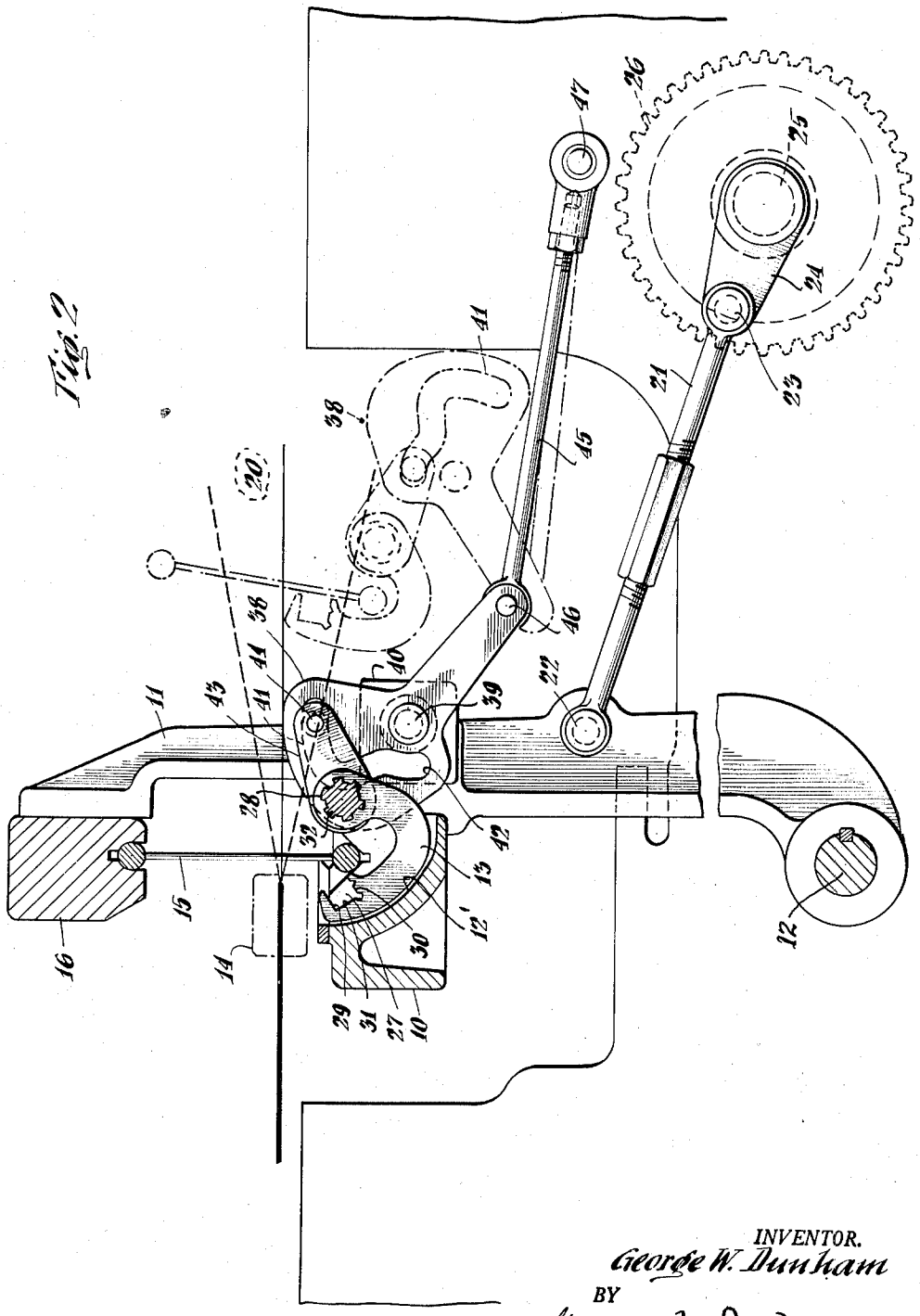
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Fig. 2



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LAY AND PILOT GUIDES

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This invention relates to looms and more particularly to a lay assembly and guides movable into and out of position for guiding a pilot or other device for carrying a filling thread through a shed of warps.

In high speed looms it is desirable to employ light pilots and guiding means for restraining the pilot from deviation laterally from its path of travel through a shed. Since the pilot is guided on all sides during its travel, it is important that the guiding means be accurately aligned in order to restrain the pilot from wobbling as it is shot across a loom. In the apparatus of the present invention, the raceway for the pilot is constructed from a plurality of plate-like guides which have notches providing edges for guiding a pilot and which confine the pilot over the expanse of an arc of 180 degrees about the longitudinal axis of the pilot as it travels across the loom. The guides are mounted in such a manner that the alignment of the notches can be assured by a finishing process which trues the corresponding edges of the various notches in alignment. The guides are mounted on a shaft which is carried by the lay assembly and mechanism is provided for rocking the guides between a position directly in front of a reed or other comb-like structure by which a filling thread is beat up and a forward position in which the guides are lowered to below the fell of the cloth and temples of the loom. The guides are moved between these positions as the lay is reciprocated. The rocking of the guides enables the shortening of the stroke of the lay even for a lay supported on long or standard lay swords. The pilot guiding notches in the guides are so disposed that their open ends come adjacent to the front plane of the comb-like structure so that the structure provides a guiding plane which together with the edges of the guides confines a pilot as in a tunnel as the pilot is shot across the loom.

It is among the objects of the invention to provide means for mounting a plurality of plate-like guides in spaced relation and in such a manner that the notches in the guides can easily be qualified to assure that the guiding edges are aligned.

Another object is to provide pilot guides and mechanism for rocking the pilot guides through the warps to a position for guiding a pilot or other filling thread-carrying device and for returning the pilot guides to below the temples as the lay is reciprocated during a weaving operation.

The principle of the invention will be easily understood from a more detailed description of an embodiment thereof which is intended to serve as an illustration of its application.

In the drawing, Fig. 1 is a plan of one end of a lay assembly of which the other end is similarly constructed; and

Fig. 2 is a vertical section on line 2—2 of Fig. 1.

Referring to the drawing, the lay **10** is mounted upon and extends between the lay swords **11** which are mounted on a pivot shaft **12**. The lay swords illustrated

are of standard length. The lay is a rigid beam which is provided with a plurality of grooves **12'** for accommodating the plate-like guides **13** when these guides move to below the fell of the cloth and the temples **14**. A reed **15** is mounted between the lay **10** and the hand rail **16** which also is attached to the lay swords **11**. A pilot-projecting and receiving box **17** is mounted at each end of the lay so that these boxes alternately project and receive a pilot **18** which carries filling thread **19** lengthwise of the lay and through the shed **20** which is formed by manipulating the warps upwardly and downwardly in the usual manner as the lay is reciprocated. Each lay sword is reciprocated by a connecting rod **21** which is pivoted at its front end to a pin **22** carried by the lay sword and is pivoted at its back end to a pin **23** carried by a crank **24**. The shaft **25** on which the cranks **24** are mounted is driven from a power source operating through a gear **26**.

The plate-like guides **13** may be stamped or cut from a durable sheet material such as steel and are finished to provide the notches **27** and the perforations **28**. The guides are formed as goose necks to properly locate the notches and to clear the bottom rail of the reed when they approach the reed, as will appear more fully hereinafter. The notches **27** are located at the upper ends of the guides and open rearwardly. The edges of the notches define a polygonal figure providing enough bearing edges to restrain the pilot from lateral motion throughout an arc of 180° about the axis of the pilot.

It is advantageous to employ a pilot having a rectangular cross-section with rounded corners but in any case the notch is proportioned to circumscribe three side surfaces of the pilot and to provide pilot-engaging edges above, below and to one side of the pilot. The notch is sufficiently deep to have the fourth side of a pilot travel along the front of a reed or other comb-like structure when the guides are in position to receive the pilot. I preferably provide a rectilinear notch having an upper edge **29** and a lower edge **30** and a connecting edge **31** so that when the guides are mounted on a rocker shaft **32**, the corresponding edges of the several guides can easily be machined and ground in true planes and to the exact size of notch desired.

The guides **13** are pressed onto the shaft **32** and are fastened against rotation by splines on the shaft which engage keyways in the guides, but they can be fastened in any manner as by welding. The guides are separated from one another by spacers, such as the sleeves **33** on the shaft **32**, and occasionally along the shaft by a trunnion **34** for the shaft and washers **35** and **36** at the sides of the trunnions, Fig. 1. The ends of the spacers are square to the axis of the shaft and so maintain the guides parallel to one another. The trunnions **34** and **37** are carried by brackets which are supported from and extend rearwardly from the lay **10**.

As the lay is reciprocated backwardly and forwardly, the shaft **32** is rocked on its axis to swing the guides between a position below the temples **14** and a position in which the notches **27** of the guides are disposed in front of the reed, as shown in broken lines in Fig. 2. This is accomplished by a cam motion. A cam plate **38** is pivoted on a pin **39** which extends from a block **40** bolted to the lay sword **11**. The cam has a cam groove connecting between and including a high arc portion **41** and a low arc portion **42**. The shaft **32** carries an arm **43** rigidly attached thereto and which has a cam follower or roller **44** at its outer end. The cam follower is engaged in the groove of the cam **38**, and as the cam is pivoted on the pin **39** it rocks the shaft **32** in its trunnions.

A link **45** is pivotally connected to the cam **38** by a pin **46** and to a stationary pivot pin **47**. As the lay

assembly is moved backward from the position illustrated in Fig. 2, the cam 38 is rocked clockwise and the arm 43 rocks the shaft 32 and guides clockwise from below the temples 14.

During the initial backward movement of the lay assembly the pilot guides remain below the temples as the follower travels along the high arc portion 41 and until the follower has started to move inwardly towards the low arc portion 42 of the cam. As the follower continues to move toward the low arc portion 42, the guides enter the shed and approach towards the reed. When the follower is guided by the low arc portion 42, the guides are disposed with the open ends of their notches facing the reed, as illustrated in broken lines in Fig. 2. In this position of the guides the pilot is restrained by the guides and the reed from wobbling in any direction as it is shot through the tunnel-like structure provided by the edges of the notches and the front of the reed. On the forward movement of the lay, the action of the cam 38 and the rotation of the shaft 32 are reversed and the guides 13 are brought below the temples. It is intended that if a comb is employed in front of a reed that the comb provide the rear guiding plane for the pilot and in that respect serve in the same manner as the reed 15 even though it does not extend to the full height of the notches 27.

This invention is capable of numerous forms and various applications without departing from the essential features herein disclosed. It is therefore intended and desired that the specific description herein be deemed illustrative and not restrictive and that the patent shall cover all patentable novelty herein set forth; reference being had to the following claims rather than to the particular showing herein to indicate the scope of this invention.

What is claimed is:

1. In a loom, a pivoted assembly reciprocable between back and front positions and comprising a lay, lay swords and a comb-like device for beating up a filling thread, a rock shaft pivotally mounted on said assembly, pilot guides fixed to said rock shaft and movable thereby to rock about the axis of said rock shaft, means for reciprocating said assembly, and means to control the rocking of said rock shaft and guides as said assembly is reciprocated between back and front positions.

2. In a loom, a pivoted assembly reciprocable between back and front positions and comprising a lay, lay swords and a comb-like device for beating up a filling thread, a rock shaft pivotally mounted on said assembly, a plurality of pilot guides spaced apart and fastened to said rock shaft, said pilot guides having aligned notches opening toward and back of the loom, means for rocking said shaft to position said notches in a shed as said assembly moves backwardly and to lower said guides below the cloth being woven as said assembly moves forwardly, and means to reciprocate said assembly backwardly and forwardly.

3. In a loom, a pivoted assembly reciprocable between back and front positions and comprising a lay, lay swords and a comb-like device for beating up a filling thread, a rock shaft pivotally mounted on said assembly, a plurality of pilot guides spaced apart and fastened to said rock shaft, said pilot guides having notches opening towards the back of the loom and having aligned edges to guide three sides of the pilot, means for rocking said shaft in one direction to position said notches adjacent said comb-like device to complete a pilot-guiding tunnel with said device and away from said device in the opposite direction, and means to reciprocate said assembly.

4. In a loom, a pivoted assembly comprising a lay, lay swords and a comb-like device for beating up a filling thread, a shaft pivotally mounted on said assembly, a plurality of pilot-guides fastened to said shaft in spaced relationship, means for reciprocating said assembly, and means for rocking said shaft as said assembly is reciprocated, said shaft-rocking means comprising an arm fastened to said shaft, a cam pivotally mounted on said assembly, a cam follower carried by said arm, and means pivotally connected to said cam to pivot said cam in respect to said assembly as said assembly is reciprocated.

5. In a loom, a pivoted assembly comprising a lay, lay swords and a comb-like device for beating up a filling thread, a shaft pivotally mounted on said assembly, a plurality of pilot-guides fastened to said shaft in spaced relationship, each of said guides having a notch opening toward the back of the loom, the notches of said guides having edges to prevent a pilot disposed in said notches from moving laterally in any direction within an arc of 180° about the longitudinal axis of the pilot, means for reciprocating said assembly, and means for rocking said shaft and guides to position the openings of said notches adjacent to said comb-like device so that said device and said notches may guide the flight of a pilot lengthwise of said lay.

6. In a loom, a lay and lay swords, means for pivotally supporting said lay swords for backward and forward reciprocation, a rock shaft, guide means for guiding a pilot lengthwise of said lay, said guide means comprising a reed carried by said lay and a plurality of relatively thin flat plates attached to said shaft and spaced from each other along said shaft, each plate having a rear edge facing towards the back of the loom, each of said plates having a notch in its rear edge, said notch being defined in part by parallel upper and lower edges intersecting the rear edge of the plate and spaced apart a distance slightly greater than the vertical dimension of said pilot and an edge normal to said parallel edges and spaced from said rear edge a distance less than the horizontal dimension of said pilot, means for actuating said rock shaft and guides to and from a position in which the rear edges of said plates are adjacent said reed and said notches are disposed with their open sides facing said reed so that said reed prevents lateral displacement of said pilot from said notches as said pilot is projected through said notches, and means for reciprocating said assembly.

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