June 29, 1937. H. SIGEL 2,085,455

LOOM

Filed March 18, 1936

Fig. 1.

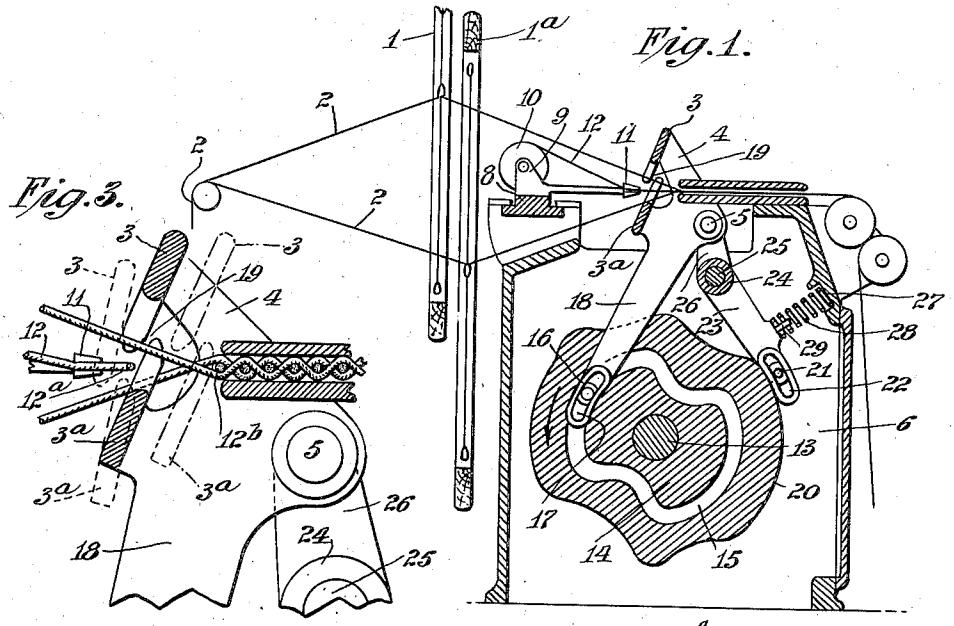


Fig. 3.

Fig. 2.

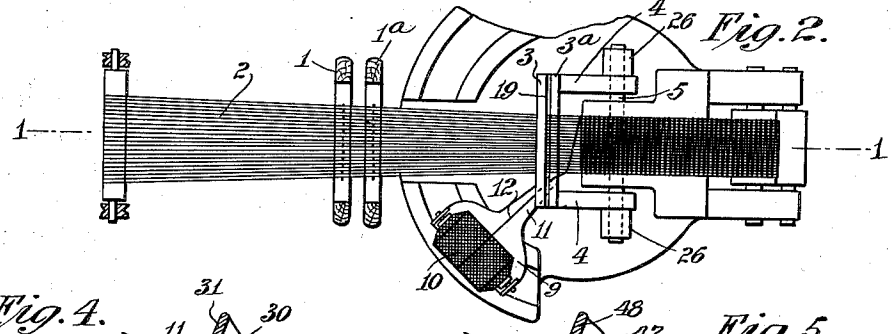


Fig. 4.

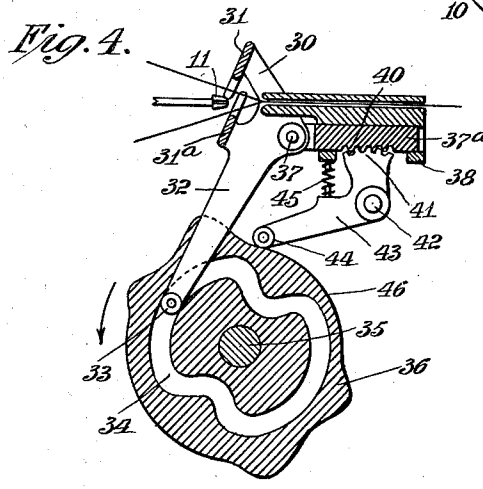
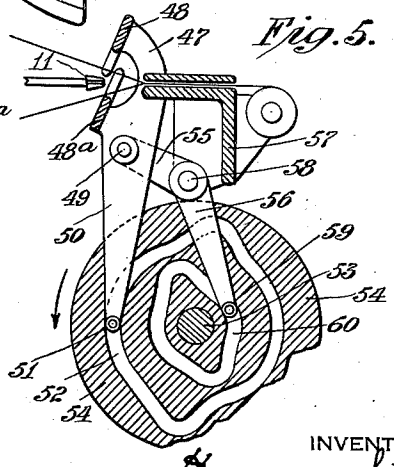


Fig. 5.



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2,085,455

LOOM

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In Germany March 23, 1935

2 Claims. (Cl. 139—191)

This invention is concerned with looms which are provided with a divided or two-part reed and has been developed in connection with ribbon looms of that type. In such looms there is commonly provided a fixed shuttle guide and the shuttle travels between the reed and the heddles. Because of the relatively slight friction of the two-part reed on the warp threads such looms as heretofore constructed can be operated at great speed, even as high as 1000 picks per minute, but because the two-part reed in such looms has only a swinging movement upward and downward heavy fabric, in which the weft thread must be strongly beaten, cannot be produced. This disadvantage of looms provided with a two-part reed, as heretofore produced, is overcome by the present invention in which the divided reed has not only the swinging movement upward and downward, as heretofore, but has imparted to it an additional movement by which the weft thread is strongly beaten in. A loom provided with a two-part reed, which not only has the upward and downward swinging movement as heretofore but has imparted to it an additional beating movement in accordance with the present invention, is capable of a high output of heavy fabric.

The invention will be more fully explained hereinafter with reference to the accompanying drawing in which several embodiments are illustrated, and in which:

Figure 1 is a view, diagrammatic and partly in section on a plane indicated by the line of 1—1 of Figure 2, of so much of a loom equipped with the present invention as is necessary to enable the application of the invention thereto to be understood.

Figure 2 is a plan view, partly in horizontal section, of some of the parts shown in Figure 1.

Figure 3 is a detail view, in vertical section on a larger scale, of some of the parts to be referred to.

Figures 4 and 5 are partial views, similar to Figure 1, but showing different embodiments of the invention.

In the embodiment of the invention illustrated in Figures 1, 2 and 3 the heddles by which the warp threads 2—2 are moved to form the shed are shown at 1, 1a.

The two-part or divided reed is shown as consisting of an upper part 3 and a lower part 3a, the two parts being mounted upon a common carrier 4 and opposed and offset somewhat with respect to each other to form between them a narrow space, as at 19, to permit the placing of the weft thread as hereinafter explained, the parts of the reed being always in engagement with the warp threads of both sides of the shed. The reed carrier 4 is mounted to swing upward and downward upon a spindle 5 and has an arm 18 which is slotted at its lower end, as at 17, to receive adjustably a pin roller 16 which engages a cam groove 15 in the cam member 14 mounted on a shaft 13, suitably supported in the loom frame 6 and rotated by any suitable means.

The spindle 5 is carried by two arms 26 on a sleeve 24 which is mounted on a spindle 25 supported in the loom frame. An arm 23 extended downward from the sleeve 24 has at its lower end a slot 22 to receive adjustably a pin roller 21 which bears on the outer cam surface 20 which is formed on the cam member in which the cam groove 15 is also formed. A spring 28, seated in the loom frame, as at 27, and centered upon a pin 29 on the arm 23, serves to press the pin roller 21 upon the cam surface 20 whereby, due to the conjoint action of the cam surface and the spring 28, the spindle 5 is swung to and fro in a substantially horizontal direction. The reed carrier 4 and two-part reed 3, 3a therefor have a to and fro movement in a substantially horizontal direction and the reed assumes the different positions indicated in Figure 3 by broken lines.

In the construction illustrated there is supported in the loom frame 6, as shown in Figure 2, a curved shuttle guide in which moves the shuttle carrier 8 on which is mounted the weft bobbin 10. The shuttle carrier is actuated in the usual manner by devices which form no part of the present invention and need not be shown or described herein. In the movement of the shuttle the shuttle bill 11 lays the weft thread 12 between the warp threads 2 which form the shed, the weft thread in the movement of the shuttle passing through the space 19 between the two parts of the reed.

In the operation of the device shown in Figures 1, 2 and 3, as the shuttle carrier 8 and shuttle 9 are moved with the bobbin 10 through the shed the shuttle bill 11 lays the weft thread 12 behind the lower part 3a of the reed, so that the weft thread assumes the position indicated at 12a in Figure 3. In the then ensuing downward movement of the reed 3, 3a, effected by the cam groove 15 as described above, the weft thread slides through the gap 19. In the then ensuing upward movement of the reed the weft thread assumes a position in front of the lower part 3a of the reed and

at this moment the frame consisting of the arms **23**, **26** is swung in a clockwise direction, as shown in Figure 1, by means of the cam surface **20**, so that the reed moves to the right and the weft thread is beaten or pressed firmly by the lower part **3a** of the reed into the position indicated at **12b** in Figure 3. In the continued movement of the cam member **14** the reed is again moved to the left, as shown by the dotted lines in Figure 3. It will be understood that the shape of the cam groove **15** and the shape of the cam surface **20** can be varied to produce such movement of the reed as may be required in the production of the fabric being woven.

In the embodiment of the invention illustrated in Figure 4 the carrier **30** for the divided reed **31**, **31a**, generally similar to the reed carrier **4** of Figure 1, is also provided with an arm **32** having a pin roller **33** which engages the cam groove **34** of the cam member **36** mounted on the driving shaft **35**, the reed thus receiving the upward and downward swinging movement. The spindle **37** on which the reed carrier is mounted is itself carried by a horizontally movable slide **37a** which is mounted in a guide **38** and is formed with a rack **40** for engagement by a toothed sector **41**. The latter is mounted on a spindle **42** and has an arm **43** which carries a roller **44** bearing on the cam surface **46** of the cam member **36**. A spring **45** serves to press the roller **44** upon the cam surface **46**.

In the operation of the devices shown in Figure 4 the reed carrier **30** is swung upward and downward through the coaction of the arm **32** and the cam groove **34** and the reed **31**, **31a** thereby has imparted to it the upward and downward movement as before. The toothed sector **41** and the arm **43** are caused by the cam surface **46** with the cooperation of the spring **45** to swing on the spindle **42**, so that the slide **37a** receives a to and fro movement in a horizontal direction, which movement is imparted to the reed **31**, **31a**.

The embodiment of the invention illustrated in Figure 5 is generally similar to that shown in Figure 1, except that both movements of the reed are effected positively. The carrier **47** for the reed **48**, **48a** swings upon the spindle **49** and has an arm **50** with the pin roller **51** which engages the cam groove **52** of the cam member **54**. The spindle **49** on which the reed carrier swings is supported by an arm **55** of a bell crank lever **55**, **56**, which is itself mounted on a spindle **58** supported by the loom housing **57**. The arm **56** carries a pin roller **59** which engages a cam groove **60** in the cam member **54**.

The operation of the embodiments of the invention shown in Figures 4 and 5 will be understood without further description.

Various changes in details of construction and arrangement can be made to suit different conditions of use and the invention therefore is not restricted to the particular embodiments shown in the drawing, except as pointed out in the accompanying claims.

I claim as my invention:

1. In a loom, the combination of a divided reed, the two parts of which are opposed to each other and are offset to permit the placing of the weft thread between them, a reed carrier mounted to swing on a horizontal axis and on which both parts of the reed are mounted for constant engagement with the warp threads of both sides of the shed, a movable support for the axis of the carrier, an actuating arm in fixed relation with the carrier, an actuating arm in operative relation with the support, and a cam member having two separate cam surfaces, the actuating arm of the carrier being in operative engagement with one of the cam surfaces of the cam member and the actuating arm of the support being in operative engagement with the other cam surface of the cam member.

2. In a loom, the combination of a divided reed, the two parts of which are opposed to each other and are offset to permit the placing of the weft thread between them, a reed carrier mounted to swing on a horizontal axis and on which both parts of the reed are mounted for constant engagement with the warp threads of both sides of the shed, a support on which the carrier is mounted and which is itself mounted to swing on a horizontal axis, an actuating arm in fixed relation with the carrier, an actuating arm in operative relation with the support, and a cam member having two separate cam surfaces, the actuating arm of the carrier being in operative engagement with one of the cam surfaces of the cam member and the actuating arm of the support being in operative engagement with the other cam surface of the cam member.

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