E. B. Bigelow.

Loom.

No. 1,561. Patented Apr. 24, 1840.

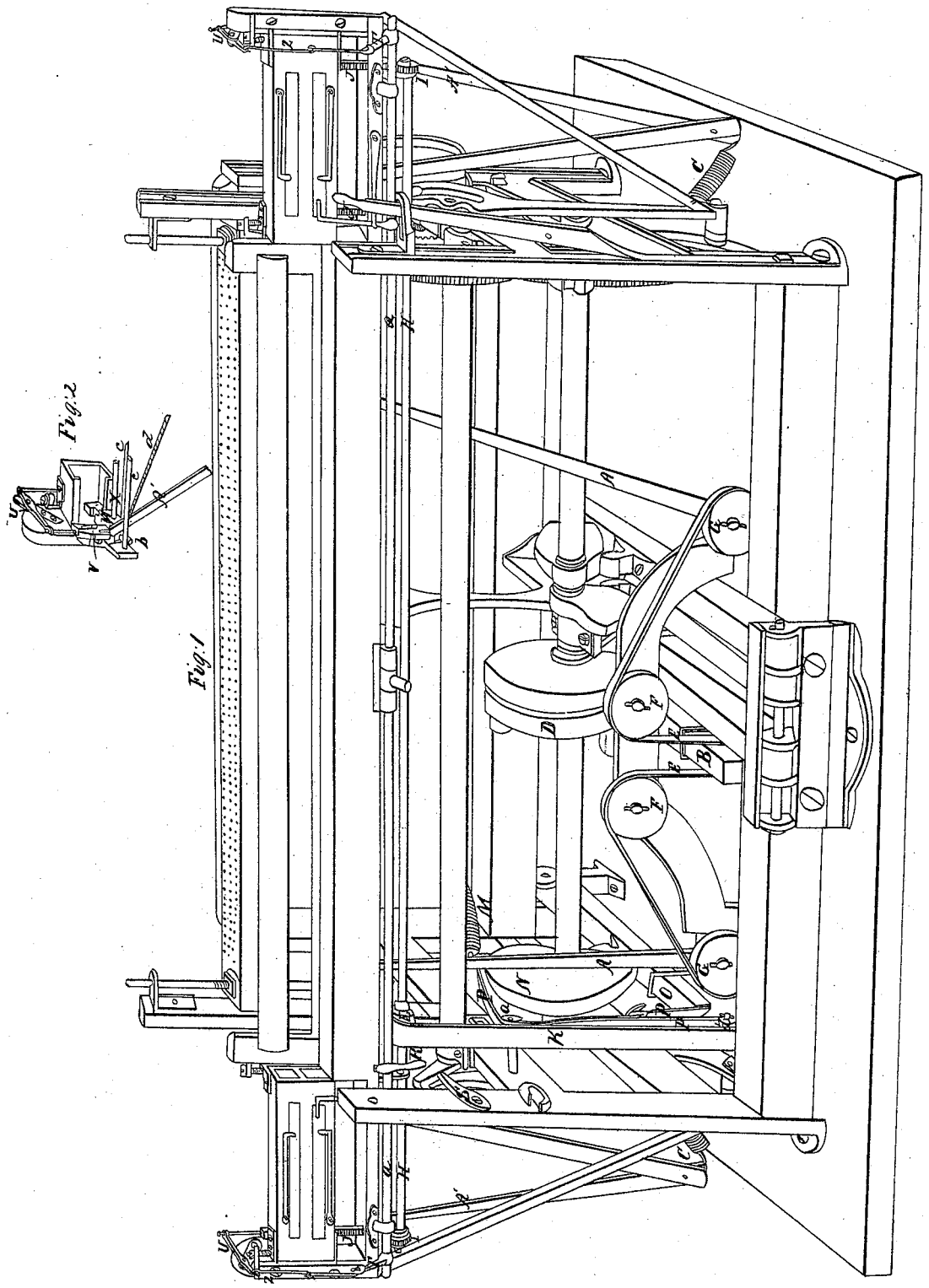

Fig. 2

Fig. 1

UNITED STATES PATENT OFFICE.

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IMPROVEMENT IN THE MODE OF CONSTRUCTING THE POWER-LOOM SO AS TO ADAPT IT TO THE WEAVING OF FIGURED COUNTERPANES AND OTHER ARTICLES.

Specification forming part of Letters Patent No. **1,561**, dated April 24, 1840.

To all whom it may concern:

Be it known that I, ERASTUS B. BIGELOW, of Lancaster, in the county of Worcester and State of Massachusetts, have invented a new and Improved Mode of Constructing the Power-Loom, by which improvements it is adapted to the weaving of figured counterpanes and to other articles of a similar character; and I do hereby declare that the following is a full and exact description thereof.

My improvements consist, principally, in the manner in which the shuttles are thrown, the manner of raising and depressing the shuttle-boxes, and the manner in which the picker is relieved from the shuttle.

In throwing the shuttles I cause the two picker-staves to operate simultaneously, so that the shuttle may be thrown from whichever of the boxes is presented to their action. This I effect by the use of one picker-treadle only, which is acted upon by a cam-ball in the usual way of working such treadles. From this treadle two bands are extended and pass around the two picker-pulleys in such manner that when the treadle is depressed both the picker-staves will be set in action at the same moment. By this arrangement two or more shuttles may be successively thrown from the same end of the loom by the action of one treadle.

The shuttle-boxes are raised and lowered in the following manner: A shaft extends along under the race-beam from one shuttle-box to the other and carries pinions which take into racks attached to the shuttle-boxes. It will be manifest, therefore, that by causing this shaft to revolve the shuttle-boxes may be raised. The revolving of this shaft is effected by the action of a spiral or other spring, one end of which is attached to the frame of the loom at its back, and said spring extends forward toward the lathe. From this forward end a band attached to it passes round guide-pulleys, the situation of which will be shown in the accompanying drawings, and also round a pulley upon the above-named shaft, to which latter said band is attached. The action of the spring by its drawing upon the band will cause the pinion-shaft to revolve, and will consequently raise the shuttle-boxes. Should this spring be thrown out of action and the band by which the shuttle-boxes are raised be relaxed, they will then descend by their own gravity. To take off the tension of the spring, there is a cam upon the main shaft of the loom, which cam, as the shaft revolves, depresses a treadle, to the end of which a band is attached which operates in such a way as to relieve the shuttle-boxes from the action of the spring, and they then descend.

In relieving the picker from the point of the shuttle I make use of the protection-rod constituting a part of the apparatus employed in the ordinary power-loom for stopping the loom when the shuttle does not arrive home in the shuttle-box. From the protection-rod, which extends along below the shuttle-boxes, I allow a small arm or finger to descend, which finger as the latter comes up toward the breast-beam strikes against a stop or pin attached for that purpose to the frame of the loom, causing the protection-rod to rock or revolve to a short distance. This gives motion to two arms, which extend out from the extreme ends of the protection-rod opposite to the outer ends of each of the shuttle-boxes. From these arms motion is communicated to a lever, which works on a fulcrum over the outer ends of each of the shuttle-boxes, said arms being connected to the levers by rods or wires. By depressing the outer ends of these levers their inner ends are raised, and to these ends are appended rods, which carry pieces of wood or metal, which when down rest on and embrace the picker-rod, and in that position they serve to hold the picker at a short distance from the end of the shuttle-box and to stop the shuttle. The picker is then removed from the point of the shuttle by the raising of the lever, the picker being made to pass home to the end of the box, thus leaving the shuttle and shuttle-box free to be raised or lowered without obstruction, the picker being also ready again to act on a shuttle.

Having thus given a general description of my improvements, I now proceed to exemplify the same by reference to the accompanying drawings.

Figure 1 is a front view in perspective of my improved counterpane power-loom, and Fig. 2 a back view of one end of one of the shuttle-boxes, this being drawn for the purpose of showing the particular construction and arrangement of this part of the machinery, which could not be exhibited in the front view.

In Fig. 1 the breast-beam is not represented, it being removed for the purpose of showing the lathe and the parts connected therewith the more distinctly.

The Jacquard apparatus, which is employed to regulate the figure and is perfectly well known, being in general use, I also use as heretofore constructed; but it is not represented in the drawings, it not being deemed necessary to describe it; but I have fully shown those parts which constitute my improvements.

A A are the picker-staves, and B the picker-treadle. D is the cam-ball for working this treadle, operating in the usual manner.

E E are two straps, which are attached to the picker-treadle. These straps pass over the pulleys F F, and are attached by their outer ends to the pulleys G G, which carry the staves A A, and these are consequently acted upon simultaneously.

The rods or staves A′ A′ serve to cause the pickers to pass home when the pieces of wood, &c., above referred to are raised. These rods are drawn toward the outer ends of the shuttle-boxes by the action of the spiral springs C C, the use of which will more fully appear when describing the parts shown in Fig. 2.

The following is the arrangement devised by me for raising and depressing the shuttle-boxes: A shaft H H is made to extend along under the race-beam, and this shaft carries the pinions I I, which take into vertical racks J J, attached to the shuttle-boxes. I sometimes use a single rack affixed at the middle of each box, but I prefer the placing of a rack and pinion at each end of each box, as shown in the drawings. There is a pulley L on the shaft H, and this shaft is made to revolve by means of a band K, one end of which is attached to and laps around the said pulley. The band K passes thence around pulleys *a a′*, the pulley *a* being attached to the frame and the pulley *a′* either to the frame or to the floor. The spiral spring M, affixed to the back of the loom, draws on the band K, attached to its fore end, so as to cause the pulley L and the shaft H to revolve and raise the shuttle-boxes. When the spiral spring M is relieved from its action on the band K, the shuttle-boxes will descend by their own gravity. When this is to take place, the tension of the spring is taken off by the action of the cam N, placed on the main shaft of the loom, which cam is so formed as to depress the treadle O, which, drawing on the part P of the band K, takes off the action of the spiral spring therefrom, and the shuttle-boxes descend.

The protection-rod *a a* and its appendages used for stopping the loom when the shuttle does not arrive home are employed by me in the ordinary way; but I also make use of this protection-rod for the purpose of relieving the shuttle from the picker in the following manner: R is an arm or finger, which is affixed to and descends from the protection-rod, and this, as the lathe approaches the breast-beam, strikes against the stop S′, attached to the frame of the loom, and causes a partial revolution of the protection-rod. T T are arms on its extreme ends, which arms are connected to two vibrating levers U U by a rod *z z*, which work on fulcra on the ends of the lathe above the shuttle-box. Fig. 2 is a back view of the outer end of one of the shuttle-boxes, showing the manner in which the lever U and its appendages operate. The piece of wood or metal V, which is raised and lowered by the action of the lever U and which is represented as resting on the picker W, will, when the inner end of the lever U is down, rest upon the picker-rod X, where it serves to arrest the picker and stop the shuttle. When the lever U is raised, the picker is thereby allowed to pass home, and is consequently removed from the point of the shuttle, and this and the shuttle-box are left free to be raised or lowered. The rod A′ bears against the pin *b*, projecting from the picker, and serves to remove it from the shuttle when the piece V is raised. The rods *c c* support the pin *b* and serve as guides to the rod A′. The cord *d* connects the upper end of the rod A′ to the upper end of the stave A in order that the stave may by its motion move the rod also.

I will here remark that a weight may be substituted for the spiral or other spring M, that the shuttle-boxes may be raised by springs placed immediately under them, and that the tension of such springs may be taken off by means analogous to those described; but it will be manifest to every competent machinist that any such variation of the respective parts will not substantially change the character of my invention. The manner of constructing and arranging the apparatus as set forth by me is that which I have deemed the best in practice.

Having thus fully described the nature of my improvements and shown the manner in which I carry the same into operation, what I claim as constituting my invention, and desire to secure by Letters Patent, is—

1. The manner in which the picker-staves are operated upon by a single treadle so as to act simultaneously, whereby two or more shuttles may be thrown successively from the same shuttle-box, if required, the apparatus therefor being constructed substantially as set forth.

2. The raising of the shuttle-boxes by the action of a spring or springs, weight or weights, and the allowing them to descend by their own gravity when the tension of the spring or force of the weight is taken off, the same being effected in the manner described, or in any other analogous thereto.

3. The relieving of the shuttle from the picker by means of an apparatus constructed and operating as herein set forth—that is to say, by the combined action of the levers U, the pieces V, and the rods A′, connected and operating substantially as described.

ERASTUS B. BIGELOW.

Witnesses:

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JAS. HERRON.