I. G. CHANDLEE.

LOOM-SHUTTLE BOX-MECHANISM.

No. 171,598. Patented Dec. 28, 1875.

Fig. 1.

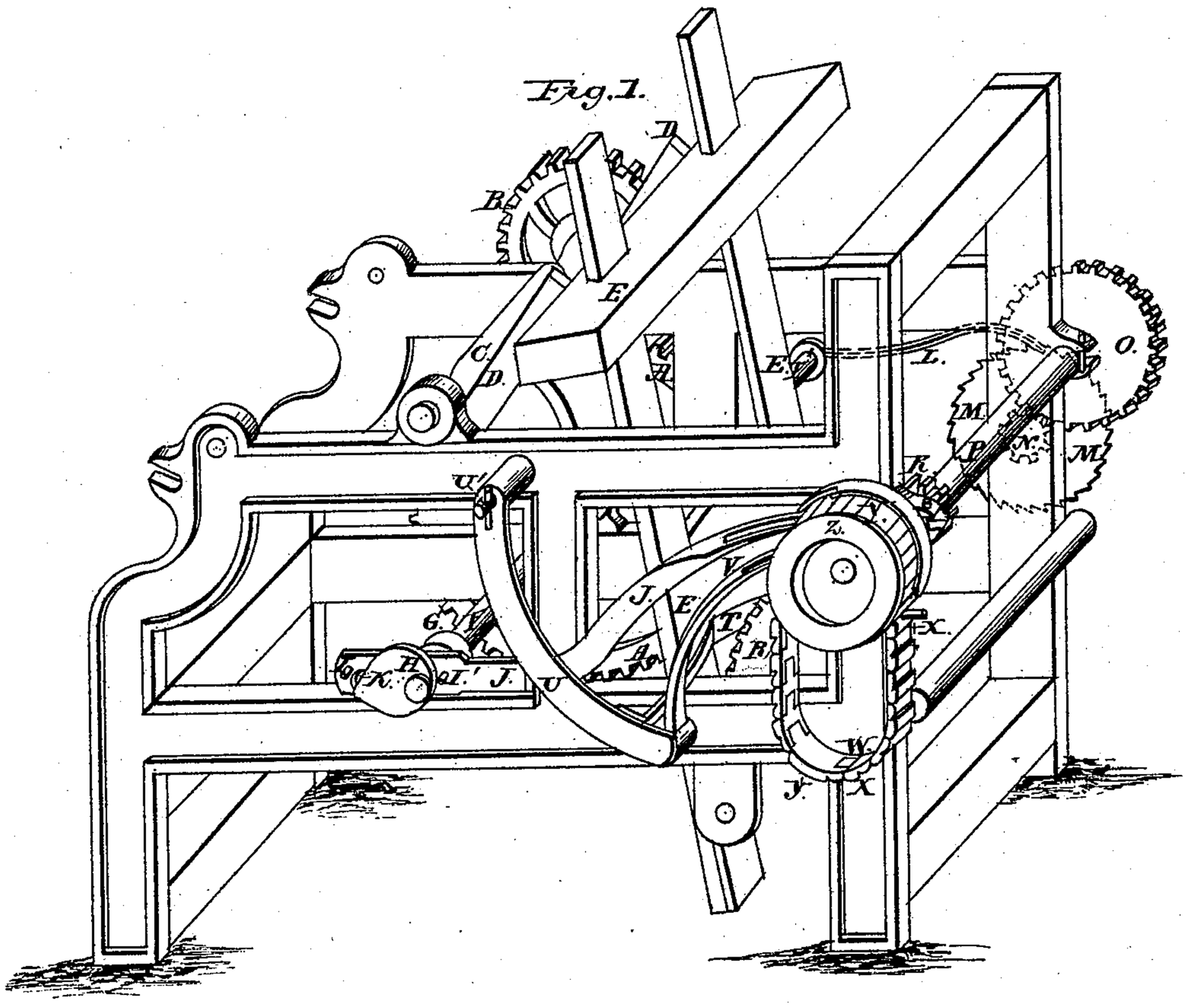
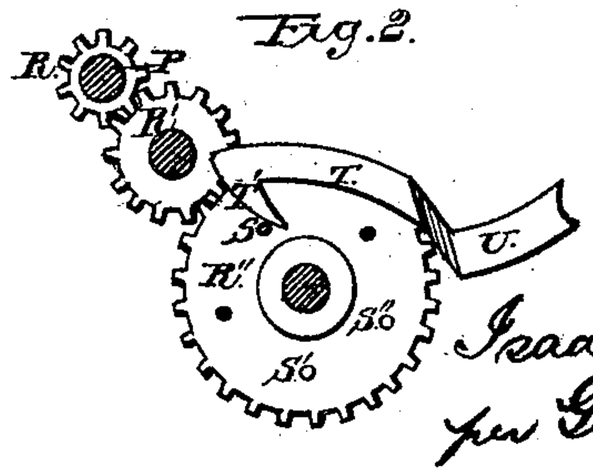


Fig. 2.



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IMPROVEMENT IN LOOM SHUTTLE-BOX MECHANISMS.

Specification forming part of Letters Patent No. **171,598**, dated December 28, 1875; application filed October 16, 1875.

To all whom it may concern:

Be it known that I, ISAAC G. CHANDLEE, of Philadelphia, Pennsylvania, have invented certain new and useful Improvements in Looms for Weaving Fabrics; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, making part hereof.

My invention consists of the combination, with the shuttle-box of a loom, of a chain having one or more of its links of greater length than the others, and so operated by pawls, or equivalent mechanism, as to produce an intermittent movement of the chain, for purposes which will be hereinafter set forth; also, of the combination, with a shuttle-box chain constructed as will be hereinafter described, of a gear-wheel having pins on its side surface, a lever whose cam-head is operated by these pins, and levers and pawls to work the chain, all arranged and operating substantially as will be hereinafter shown.

To enable others skilled in the art to make and use my invention, I will describe its construction and operation.

In the drawings, Figure 1 is a perspective view of a loom with my improvement attached; Fig. 2, a detached view of the lever and cam end operated by the pins on the gear-wheel.

A is a gear-wheel gearing into a similar wheel, B; C, a crank-shaft; D, wooden links between the cranks on shaft C and beam E. F is the shaft of gear-wheel A; G, a journal or shaft box; H, a cam which revolves with shaft F; I I, projecting pins on the slotted heel of push-lever J; K, a slot in the heel of push-lever J; L, a small push-lever, the heel of which is pivoted loosely to the upright of beam E, and the end of which drops between the teeth of ratchet-wheel M, upon the shaft of which latter is secured a small cog-wheel N, which gears into and turns large gear-wheel O on shaft P. R R′ R′ are gear-wheels gearing into each other. S S′ S″ are projecting pins on the side face of gear-wheel R″. T is a lever with a cam-hook end, the cam-surface being T′. This lever is a rigid arm from the lifting-lever U, which is pivoted or swung at U′. V is a pawl jointed or pivoted to the end of lever U. W is the chain. X are lips upon the links for the push-lever J to bite in to move the chain. Y are the lengthened links; Z, bearing or guide for the chain. The shuttle-boxes are connected with the pins upon the chain by means of levers, in a manner well known to those acquainted with lifting or sliding shuttle-box looms, so that when the chain passes over the bearing-box the pin, through these levers, changes the height of the shuttle-box, so that a different shuttle is thrown through the fabric. The chain is moved by the push-lever J catching in the lips X, and pushing each link forward. The object of this invention is to automatically stop the progress of the chain until, with one shuttle and one size or color of yarn, a desired continuous long and even strip of pattern is woven; then to automatically start the chain again, and, after operating in the ordinary way, to repeat the stoppage which I have described, principally to weave a long plain strip between ornamental patterns or bars.

The operation of my device is as follows: Y Y are lengthened links, between each of whose lips X and the lip of the immediately-preceding link there is a greater space than occurs between the lips of any two adjacent ordinary links. They are longer than the ordinary links, so that when the push-lever J throws the immediately-preceding link forward, that action will not draw the lengthened link far enough to enable the end of the push-lever J to grasp its lip until said lengthened link is pushed up by the pawl V, or by other convenient means; and until this is done the end of lever J slides along the surface of the lengthened link, and, having nothing to grasp, leaves the chain stationary.

Power is communicated to the gear-wheel A, which revolves gear-wheel B and crank-shaft C. This imparts motion through links D to the weaving-beam E, and beam E, in turn, to the pawl L. The stroke of beam E gives pawl L a somewhat long reach, and as the outer end of this pawl L drops and works in the teeth of ratchet-wheel M, it pushes this ratchet-wheel round by an intermittent action, being drawn back and pushed forward, the latter part of its movement operating the ratchet-wheel M. A small gear-wheel, N, on

the hub of the ratchet, drives the large gear-wheel O by a slow motion, which revolves shaft P and gears R R′ R″. Shaft F passes through a slot, K, in the heel of push-lever J, and carries a cam, H, which works between two pins, I I′, on the lever, and reciprocates it. The push-lever J is adapted to strike the lips X of the links of the chain W, and pushes the chain forward a link at a time at each forward movement, or at each stroke of the cam H upon pin I′; but when the lever J pushes forward the link preceding either of the lengthened links Y, it does not push the chain far enough to permit it to grasp the lip of the lengthened link Y, which is taken by the inactive pawl V, and the chain remains at rest, and, consequently, no change is made in the shuttle-box until this lengthened link is pushed far enough to allow the lever J to take its lip, and this is accomplished as follows: The machine is so adjusted that when a lengthened link is reached the cam-hook lever T will have previously dropped over a pin, S; the slow motion of gear-wheel R″ then gradually brings around the next pin S′, which, striking near the outer end of the cam-surface T′, slides along the cam-hook; and lifts it until its point is reached, which raises the whole of levers T and U and the pawl V. This pawl V then, for a moment, becomes the assistant of the push-lever J, and it pushes the lengthened link far enough forward to permit the end of the push-lever J to take the lip of the link, when the lip is left bare by the dropping down of the pawl V, which latter operation is accomplished by the pin S′ passing the lower point of the cam T′, which allows the cam-lever T and lever U to drop of their own weight, and with them the pawl V, thereby leaving bare, as above stated, the lip X of the lengthened link, to be acted upon by the push-lever J, thus starting the chain, which acts on the shuttle-boxes until another lengthened link is reached, when the chain again becomes stationary, and the operation of pawl V, just described, is repeated. It will thus be seen that from the time a lengthened link is reached by push-lever J until it is thrown forward by pawl V, there will be but one shuttle in continuous operation, as there can in that period be no change in the shuttle-box, and by graduating the distance between pins S S′ S″, or the speed of R″, any desired length of plain material can be woven with one shuttle before any changes in the pattern or design are made.

This device is specially useful in weaving balmorals, handkerchiefs, shawls, &c., and requires the use of but a short chain.

My invention may be applied to looms the shuttle-boxes of which are operated by a pattern-wheel instead of a chain, by simply lengthening the spaces between the catches or notches, in which the pawl bites to turn the wheel, at such intervals as, if a chain were used, a lengthened link would occur. It may be used also upon a revolving box-loom. The lengthened links may be mounted with pins like the other links, if desired.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In combination with the shuttle-box of a loom, a chain having one or more of its links of greater length than the others, operated by mechanism, substantially as shown, to produce an intermittent movement of the chain, substantially as and for the purposes set forth.

2. In combination with a shuttle-box chain, constructed as described, driving-pawls J and V, gear-wheel R″, pins S, and cam T, all arranged and operating together substantially as described.

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