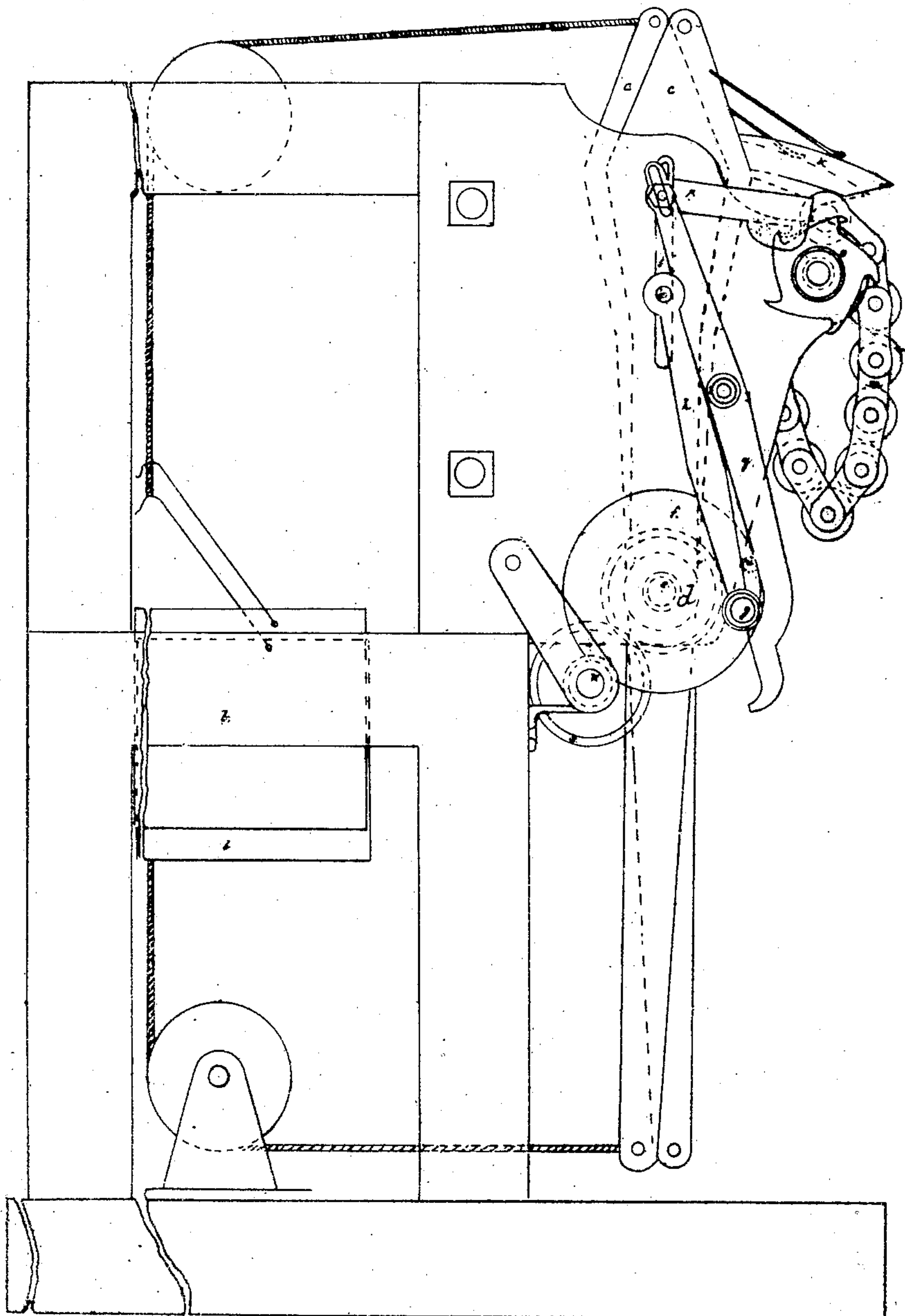


*Bachelor & Bliss.*  
*Operating Harness for Loom.*  
*N<sup>o</sup> 76036*      *Patented Mar. 31, 1868.*

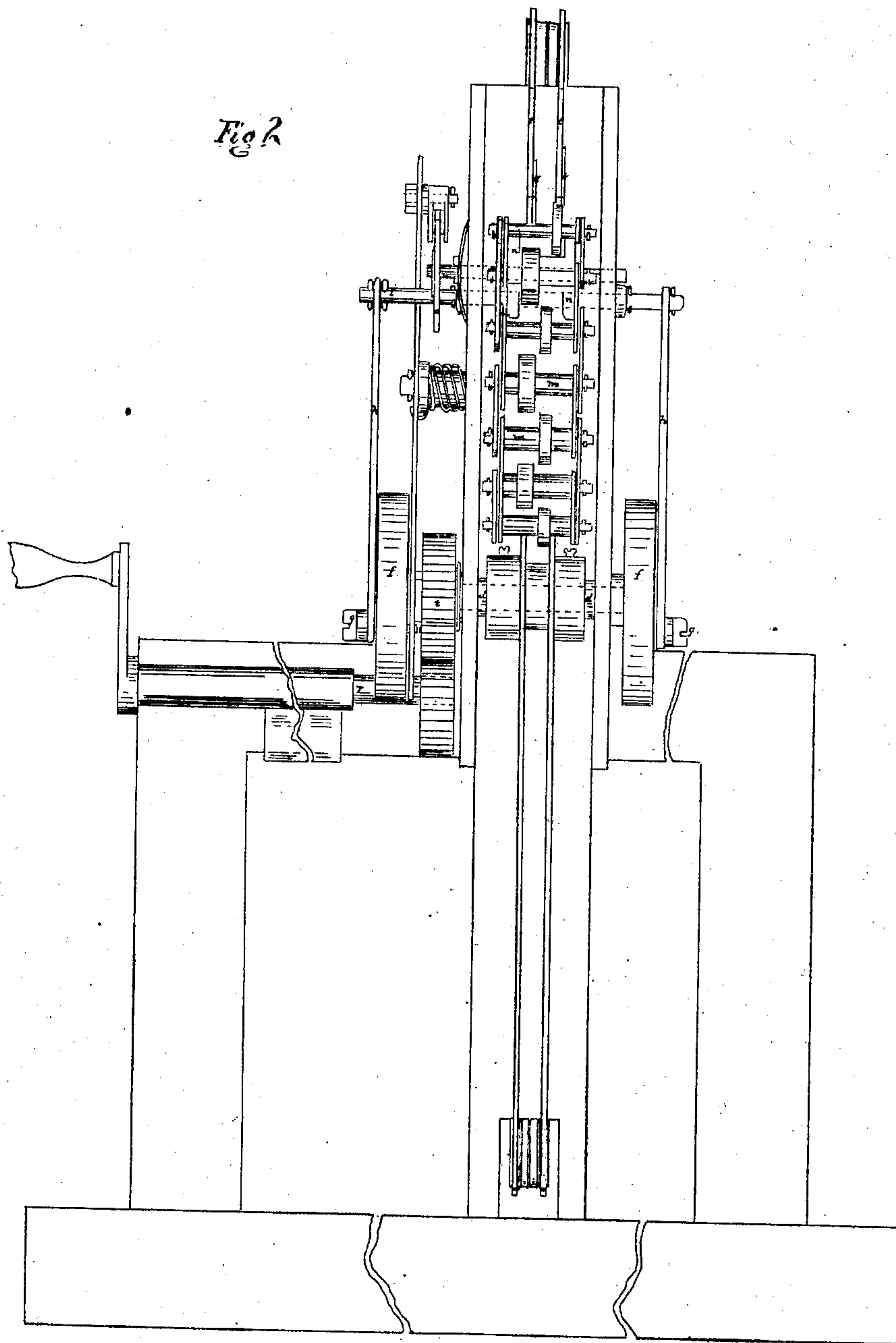
*Fig. 1*



*Witnesses { John T. Fanning.*  
*J. C. Hines.*

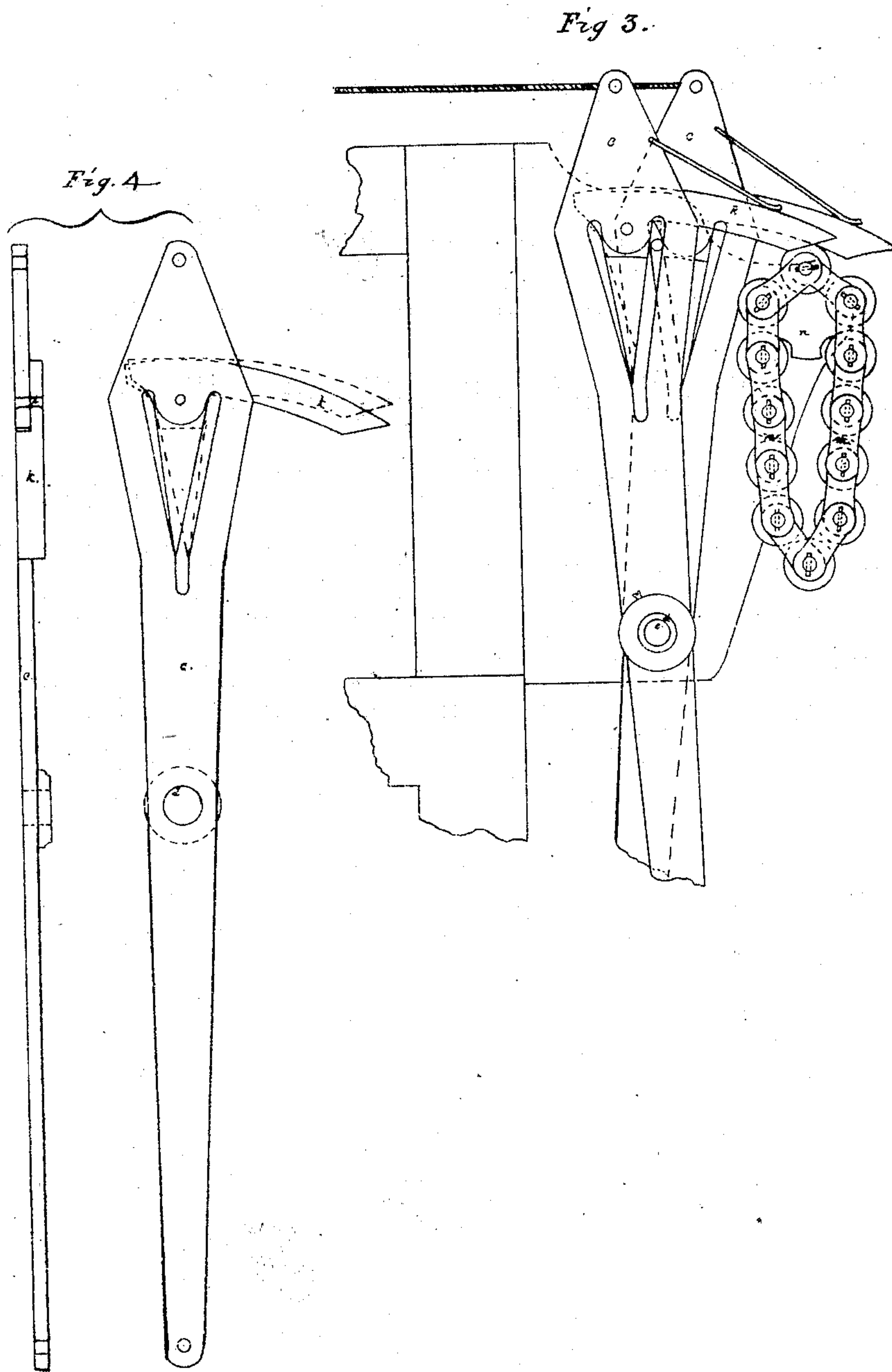
*Inventors { John Bachelor*  
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*Nº 76036*      *Patented Mar. 31, 1868.*



Witness { John T. Manning  
J. C. Hinde. }

Inventors { John Bachelor  
William Bliss. }



# United States Patent Office.

JOHN BACHELDER AND WILLIAM H. BLISS, 2D, OF NORWICH, CONNECTICUT, ASSIGNORS TO JOHN BACHELDER.

*Letters Patent No. 76,036, dated March 31, 1868.*

## IMPROVEMENT IN HARNESS-OPERATING MECHANISM FOR LOOMS.

*The Schedule referred to in these Letters Patent and making part of the same.*

Be it known that we, JOHN BACHELDER and WILLIAM H. BLISS, 2d, of Norwich, in the county of New London, and State of Connecticut, have invented a new and improved Mode of Operating Harness in Looms; and we do hereby declare that the following is a full and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, in which—

Figure 1 is a front elevation.

Figure 2 a side elevation.

Figure 3 a section, seen from the same position as fig. 1, with intervening parts removed. This figure is designed to show the combined operation of the slotted levers or jacks, *c*, and the switch-lever, *k*, with the pattern-chain, *m*.

Figure 4 represents the jacks *c c* and the switch-lever *k*, and is designed to show the manner of construction.

The nature of our invention consists, first, in constructing the jack-levers with a switch-lever attachment applied wholly above the axis or pivot on which said levers swing or vibrate, whereby the well-known compound jacks are rendered capable of being applied to looms which are now in general use, at a much less expense, and with much better results, owing to the number of parts being less, and the operation of these parts being more direct in their action upon the pattern-chain, and the mechanism used to actuate the chain being much simpler and more desirable than that heretofore employed; second, our invention consists in the combination of the jack-levers with switch-attachment, as described, the gearing shown and the pattern-chain, as will be hereinafter described; third, it consists in the arrangement of a tubular sleeve, fitted loosely on the shaft carrying the eccentrics, and having the jack-levers fitted loosely upon it, whereby each jack is allowed an independent movement, and the shaft allowed to revolve independently of the jacks, and thus a support from said shaft is secured for the jacks, without any wear upon the jacks being experienced by reason of the revolution of said shaft within the tube.

In the annexed drawings, *a* represents the frame of the loom, *b* the harness, *c* the jacks, to end each of which is connected the harness by cords or belts. *d* represents a hollow shaft, the external surface of which supports the jacks *c*, and the hole through it a bearing for the shaft *e*. Upon each end of the shaft *e* is fixed a face-plate, *f*, having wrists or crank-pins *g*, connected by pitmen *h* to the slot-bar *i*, thus producing a reciprocating vertical motion of the slot-bar *i* when put in operation, the slot-bar *i* being guided by the slot in the metallic framework *j*. The vibrating switch-lever *k* is secured to the jack *c* by a pin, *l*, upon which it works loosely. *m* represents a pattern-chain, in common use on other fancy looms, supported by the chain-carriage *n*, the ratchet *o* being fixed upon one end, and moved one tooth by the pawl *p* at every revolution. The pawl *p* is jointed to the lever *q* and operated by a pin, *u*, set in the back side of the face-plate *f*.

To put the above-described machinery in operation, we turn the crank fixed upon the shaft *r*, this shaft having a spur-gear, *s*, fixed upon the opposite end, working into the gear *t* fixed upon the shaft *e*, which, at every revolution, causes the slot-bar *i* to ascend and return, and the lever *q*, with the pawl attached, to move the pattern-chain one link. When the pattern-chain is moved, the arm of the switch-lever *k* (the slot-bar *i* being at the bottom of the guiding-slot *j*) either drops or is raised by a truck on the pattern-chain. If the arm of the switch-lever is raised, the point of the pendent part is moved to the right, closing the passage to the slot-bar on the right in the top of the jack *c*, and leaving it open on the left, thus throwing the top of the jack *c* to the right and raising the shade of harness attached to it. When no truck of the pattern-chain comes in contact with the arm of the switch-lever, it drops, and the pendent point is held against the left side of the jack, leaving the passage open on the right, and thus throwing the top of the jack to the left, and the shade of harness to which it is attached down.

The number of jacks and corresponding number of shades of harness are only limited by the capacity of the loom to receive them.

The springs, shown attached to the jack-heads in the drawings, are not required in a full-size working-loom, the weight of metal in the arm of the switch-lever *k* being sufficient without it.

What we claim as our invention, and desire to secure by Letters Patent, is—

1. The vertical jack *c* and pivoted switch-lever *k*, both constructed and combined as shown, the switch-lever being attached above the axis of the jacks, and arranged with the pattern-device, as and for the purpose set forth.
2. The compound jack-lever *c k*, constructed as described, in combination with the pattern-device and with the mechanism, substantially as shown, which actuates the pattern, all for the purpose set forth.
3. The arrangement of the sleeve *d*, jack-levers *c*, shaft *e*, and eccentrics or cranks *f f*, substantially in the manner and for the purpose described.

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WILLIAM H. BLISS, 2d.

Witnesses:

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ALBERT S. BOLLES.