

W. AIKEN.  
Narrowing Mechanism for Knitting-Machine.  
No. 205,167.      Patented June 25, 1878.

Fig. 1.

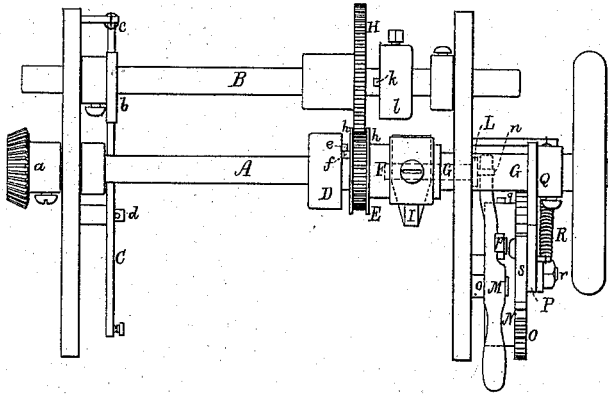


Fig. 2.

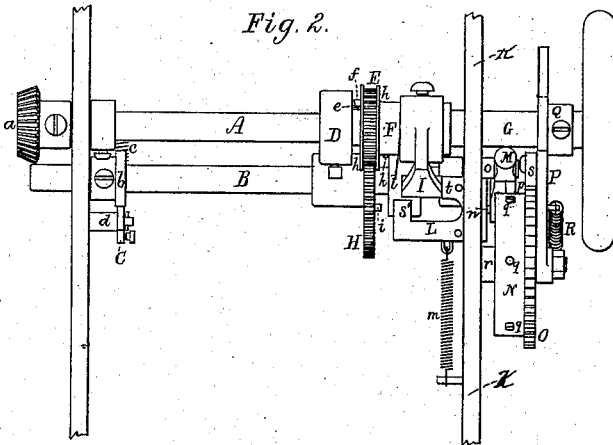


Fig. 3.

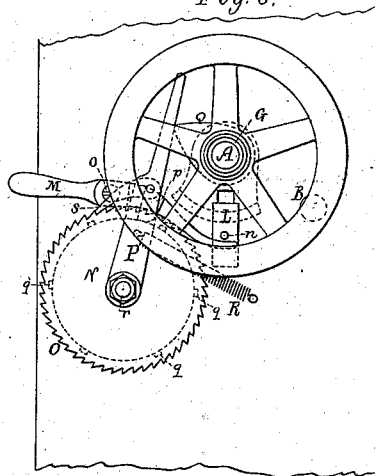


Fig. 4.

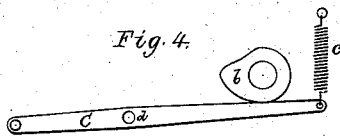
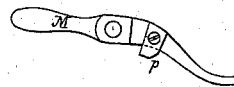


Fig. 5.



Witnesses.  
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*John. Robson*

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Walter Aiken.  
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# UNITED STATES PATENT OFFICE.

WALTER AIKEN, OF FRANKLIN, NEW HAMPSHIRE.

## IMPROVEMENT IN NARROWING MECHANISMS FOR KNITTING-MACHINES.

Specification forming part of Letters Patent No. **205,167**, dated June 25, 1878; application filed May 27, 1878.

*To all whom it may concern:*

Be it known that I, WALTER AIKEN, of Franklin, in the county of Merrimack and State of New Hampshire, have invented a new and useful mechanism for throwing into and out of action, at proper periods of time, two shafts constituting parts of or for actuating the knitting and narrowing mechanisms of a straight-knitting machine; and I do hereby declare the same to be described in the following specification and represented in the accompanying drawings, of which—

Figure 1 is a top view, Fig. 2 a front elevation; and Fig. 3 an end elevation thereof. Such other figures as are necessary to the illustration of my invention are hereinafter explained.

With my invention applied to the driving-shafts of the knitting and narrowing mechanisms of a knitting-machine, I am enabled to operate the knitting mechanism thereof very much faster, and thereby greatly increase the amount of work done, comparatively speaking.

In the drawings, A denotes the driving-shaft of the knitting-machine, it being provided at one end with a bevel-gear, *a*, which in practice is to engage with another bevel-gear formed on a cranked shaft, for aiding in effecting the reciprocating movements of the sliding bar that bears the cam for operating the needles, all such being well understood by persons conversant with knitting machinery, and shown particularly in the United States Patent No. 187,696. Arranged parallel to such shaft A is the other or narrowing-mechanism operative shaft B, it being shown or provided with a cam, *b*, disposed over one arm of a lever, C. A side view of such cam and lever is shown in Fig. 4. There is applied to the lever-arm a spring, *c*, for raising it.

During each revolution of the shaft B the lever will have a reciprocating movement on its fulcrum *d*. This lever may be supposed to constitute part of or to be suitably applied to the narrowing mechanism, to cause it to be put in operation while the cam may be moving the lever.

A circular head, D, fastened on the shaft A, has a stud, *e*, projecting from its side, to engage with a similar stud, *f*, extending from the next adjacent side of a gear, E, carried by a tube or sleeve, F, which slides lengthwise on a

tubular shaft, G, through which the shaft A extends. The sleeve F should be so connected with the shaft G, by a feather connection or other means, as to revolve with and be revolved by the said shaft, and be capable of endwise movements thereon.

The gear E has flanges *h h* on its sides, such flanges being to lap on the opposite sides of another gear, H, (having a diameter larger or double that of the gear E,) when the two gears are in engagement. The said gear H turns loosely on the shaft B, such gear having a stud, *i*, extending from its side, to engage with a stud, *k*, extending from the next adjacent side of a circular head, *l*, fastened on the shaft B. Furthermore, there is fixed to the sleeve F a cam, I. Underneath the said cam, and applied in the frame K so as to slide vertically therein, is a notched abutment, L, provided with a spring, *m*, for depressing it. A stud, *n*, from the outer end of such abutment, extends over one arm of a lever, M, having its fulcrum arranged as shown at *o*, such lever being represented in side view in Fig. 5.

The lever is furnished with a cam or tooth, *p*, extending down from it directly over a series of teeth, *q*, projecting radially from the periphery of a wheel, N. The said wheel is provided with a ratchet-wheel, O, and is supported on a stationary pivot, *r*, which serves as the fulcrum of a lever, P, carrying a pawl, *s*, to engage with the ratchet-wheel. At its upper part the lever P bears against the periphery of a cam, Q, that is fixed on the shaft G. A spring, R, applied to the lever P serves to draw it in contact with the cam.

In each revolution of the shaft G the lever P will have imparted to it a reciprocating movement, such as will cause it to advance and retract the pawl on the ratchet-wheel, whereby an intermittent circular motion will be imparted to the toothed wheel N.

Each of the teeth *q*, on being carried against the tooth *p* will force it and its lever upward, and keep them so raised until the tooth *q* passes beyond the tooth *p*. This upward movement of the lever will create a corresponding rise of the abutment, which will be elevated into a position for its vertical part *s'* to be met by the cam I during its revolution. The cam, in passing against the part *s'*, will be caused to

move the sleeve F endwise in a manner to unclutch the gear E from the shaft A, and move the gear H so as to clutch it to the shaft B. Thus the shaft A, which before was clutched to the lesser gear, will be stopped, and the shaft B will be put in revolution. On the tooth of the wheel having passed off the tooth of the lever the abutment will, by its spring, be drawn down to its lower position. This having taken place, the cam I, in passing against the horizontal part *t* of the abutment, will be moved so as to move the sleeve F in a manner to cause the lesser gear to be clutched to the shaft A, and the larger gear to be unclutched from the shaft B. The said shaft B will thereby be stopped and the shaft A will be put in revolution.

What I claim as my invention is—

The combination, substantially as described, for alternately putting the two shafts A B in revolution, such consisting of the shaft G, sleeve F, cam Q, lever P, spring R, pawl *s*, ratchet-wheel O, toothed wheel N, toothed lever M, notched abutment L, spring *m*, cam I, duplex flanged gear E, plain gear H, studs *e f i k*, and circular heads *D l*, all being arranged and applied essentially in manner as shown, and to operate as specified.

WALTER AIKEN.

Witnesses:

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