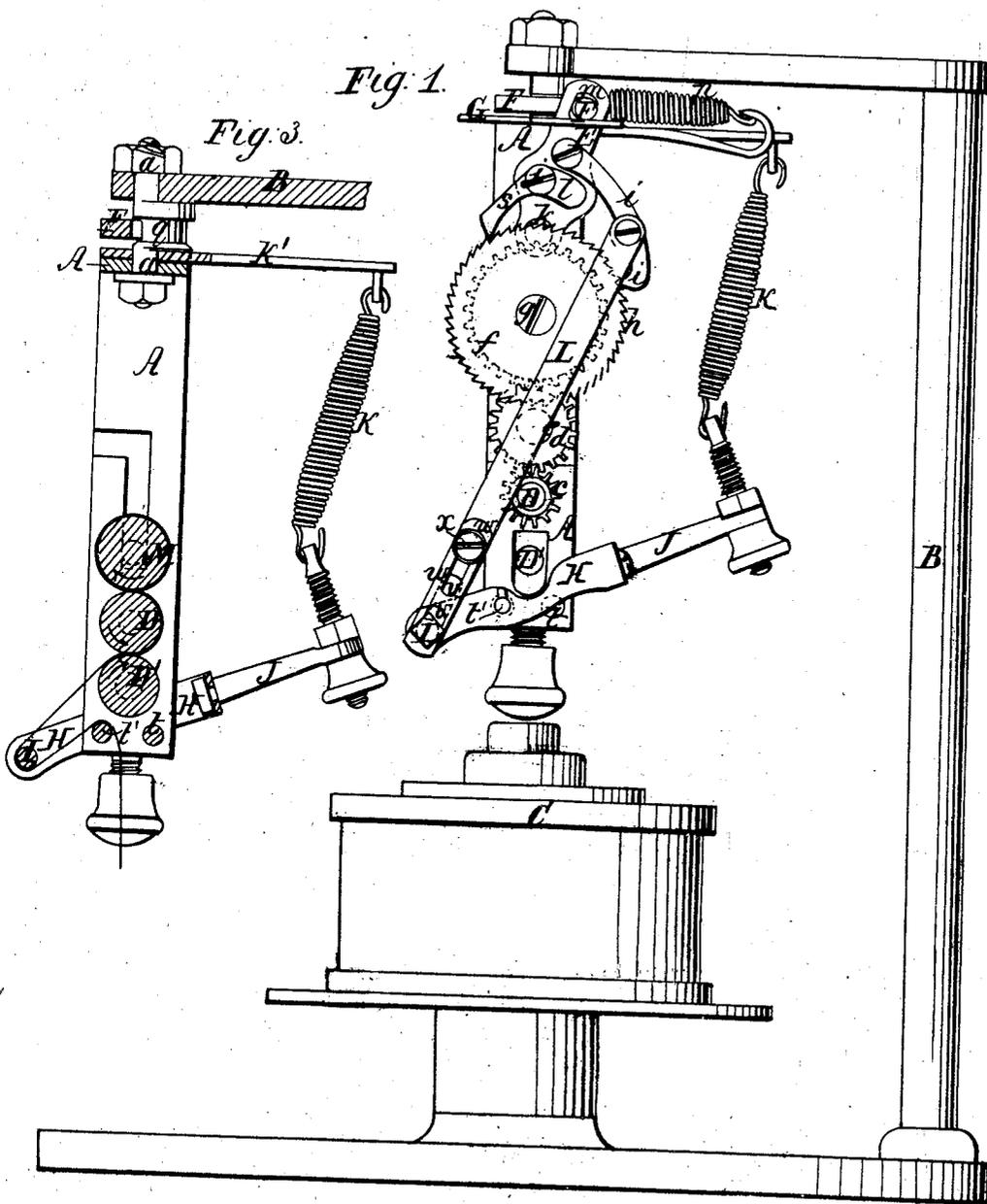


No. 35,968.

PATENTED JULY 22, 1862.

G. CAMPBELL.
CIRCULAR KNITTING MACHINE.

2 SHEETS—SHEET 1.



Witnesses;
C. W. Reed
E. W. Hodgson

Inventor;
G. Campbell
per Munn & Co
Attorneys

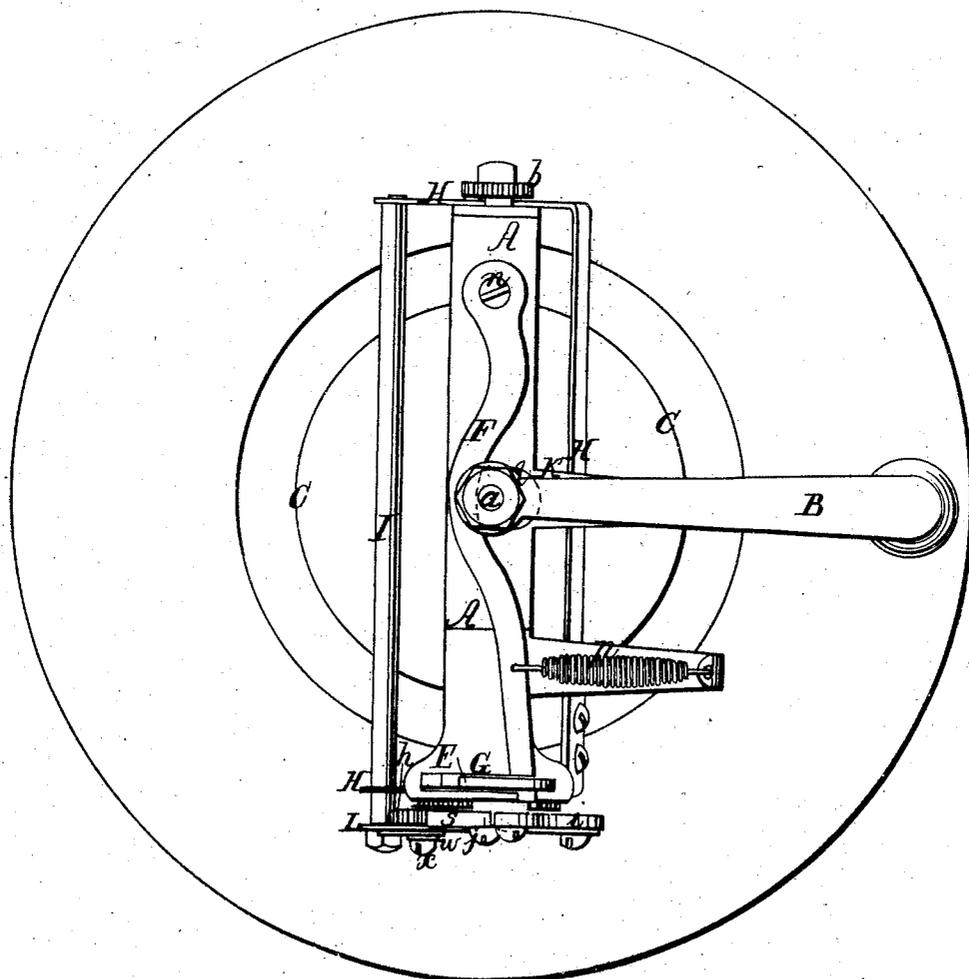
No. 35,968,

PATENTED JULY 22, 1862.

G. CAMPBELL.
CIRCULAR KNITTING MACHINE.

2 SHEETS—SHEET 2.

Fig. 2.



Witnesses;
G. W. Reed
E. du Rocher

Inventor;
G. Campbell
per Munn & Co
Attorneys

UNITED STATES PATENT OFFICE.

GEORGE CAMPBELL, OF WATERFORD, NEW YORK, ASSIGNOR TO HIMSELF,
GEO. GAGE, AND GEO. C. GAGE, OF SAME PLACE.

IMPROVEMENT IN CIRCULAR-KNITTING MACHINES.

Specification forming part of Letters Patent No. 35,965, dated July 22, 1862.

To all whom it may concern:

Be it known that I, GEORGE CAMPBELL, of Waterford, in the county of Saratoga and State of New York, have invented a new and useful Improvement in the Take-Up of Circular-Knitting Machines; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side view of the take-up. Fig. 2 is a plan of the same. Fig. 3 is a vertical section of the principal parts of the same.

Similar letters of reference indicate corresponding parts in the several figures.

This invention relates to the take-up of those cylinder-knitting machines in which the needle-plate or needle-ring and the work have a rotary motion; and it consists in a certain means of producing and controlling the movements of a pair of take-up rolls arranged above the knitting-machine with their axes perpendicular to the axis of rotation of the needle plate or plates.

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

A is a quadrangular frame suspended in an upright position above the knitting-machine from a crane-like standard, B, by means of a fixed upright pin or stud, *a*, which is secured in the said standard with its axis in line with the axis of the needle-ring or needle-plate. The said pin or stud only passes through the upper part of the said frame, and the frame is free to have a rotary motion upon the said pin corresponding with the rotary motion of the needle-plate or needle-ring C.

D D' are the take-up rolls, arranged horizontally in the lower part of the frame A and geared together outside of one end of the said frame by a pair of spur-gears, one of which is indicated by the letter *b* in Fig. 2. Outside of the opposite end of the frame the upper roll, D, whose bearings are fixed in the said frame, has firmly secured to it a spur-gear, *c*, Fig. 1, which gears with a loose gear, *d*, attached to the frame A by a stud, *e*, and this gear *d* gears with another loose spur-gear, *f*, attached to the frame A by a stud, *g*. This spur-gear *f* has firmly secured to it a ratchet-wheel, *h*. By turning this ratchet-wheel *h* motion is im-

parted to the gear *f*, through it to the gear *d*, and through it to the gear *g* and to the take-up rolls. For this ratchet-wheel there are provided two pawls, *s* and *i*, the latter for giving it the necessary motion to produce the taking up of the work, and the former for preventing it from turning back and thereby causing the retention of the work after it has been taken up. The pawl *s* is attached to the side of the frame A by the stud *j* and the pawl *i* to a lever, E, which works upon a fulcrum-pin, *k*, attaching it to the frame A. The lever E is slotted at about the middle of its length, as shown at *l*, Fig. 1, to allow it to work clear of the stud *j*, and near its upper end it has an opening, *m*, for the reception of the end of a lever, F, which is arranged to work horizontally on the top of the frame A on a fulcrum-pin, *n*, Fig. 2, which attaches it to the said frame. This lever F is kept by a spring, *p*, in contact with an eccentric, *q*, formed upon or secured to the pin *a*. The distance of the movement of the levers F and E is limited by the upper part of the lever E working in a slot, *r*, in a plate, G, which is secured on the top of the frame A.

The rotation of the frame A upon the pin *a*, produced by and corresponding with the rotary motion of the needle-ring and the work, causes the lever F to have a regular vibrating motion imparted to it by the revolution around and in contact with the stationary eccentric *q*, and that lever imparts motion to the lever E in such manner that if the pawl *i* is not held up out of gear with the ratchet-wheel *h* the said pawl will produce a movement of the said ratchet-wheel, and so cause a quantity of the knitted fabric to be taken up by the rollers D D' at every revolution of the knitting-machine; but this pawl is held up out of gear with the ratchet-wheel by the tension of the goods, except when the said tension becomes so slight as to require more goods to be taken up. The means through which the tension is made to act upon the pawl are as follows:

t t' are two fixed round bars forming the bottom of the frame A, arranged side by side below the lower take-up roll, D', and parallel with the take-up rolls. H is a frame arranged to rock upon the ends of the bar *t'*, which are made to project through the ends of the frame A for the purpose. This frame carries on one

side a roll, I, parallel with the take-up rolls, and on the opposite side it has an arm, J, which is connected by a spring, K, with a rigid arm, K', secured to the top of the frame, the said spring tending to pull up the arm J and depress the roll I, which is connected with the pawl *i* by means of a rod, L, in such manner that when the said roll is raised the pawl is raised also, and vice versa.

The knitted goods, represented by a red line in Fig. 3, pass upward from the machine over the bar *t*, under the roll I, thence upward between the take-up rolls to a roll, M, on which it is to be wound as fast as taken up, the said roll L resting on the top take-up roll, D, deriving motion therefrom by the friction of their surfaces and of the interposed goods. The tension of the goods acts to raise the roller I and lift the pawl *i* out of gear with the ratchet-wheel *h* in opposition to the action of the spring K, which tends to depress the roll and keep the pawl in gear, and hence while the goods have a certain degree of tension the action of the take-up rolls is suspended; but when the tension becomes less the rolls resume their action. To provide for taking up with greater or less rapidity, for the purpose of making the work less or more close, the rod L is made with a slot, *v*, at its connection with the roller I, the end of the said roller passing through the said slot, and a slotted covering-plate, *w*, being fitted to the outside of the said rod and secured thereto by a screw, *x*, for the

purpose of closing (more or less) the upper part of the slot *v*. When much of the slot *v* is uncovered, the roll I is allowed to rise higher, without acting upon the rod L, to fit the pawl than when less is uncovered, and hence by adjusting the plate *w* higher up the rod the goods will be caused to be taken up faster, as the take-up rolls will continue in operation with a greater degree of tension on the goods, or by adjusting the plate *w* lower down the rod the opposite effect will be produced.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The employment, for operating the take-up roll or rolls DD', of a lever, F, attached to the rotating frame of the take-up and rotating with the said frame in contact with a fixed eccentric, *g*, a pawl-lever, E, carrying a pawl, *i*, and a ratchet-wheel, *h*, geared with the said rolls, the whole combined, applied, and operating substantially as herein specified.

2. Controlling the action of the take-up by the tension of the cloth by means of the frame H, bar *t*, roller I, spring K, or its equivalent, and rod L, the whole applied in combination with the take-up rolls and with the pawl *i*, from which they derive motion, substantially as herein specified.

GEO. CAMPBELL.

Witnesses:

WM. A. WALDRON,
GEO. S. WATERMAN.