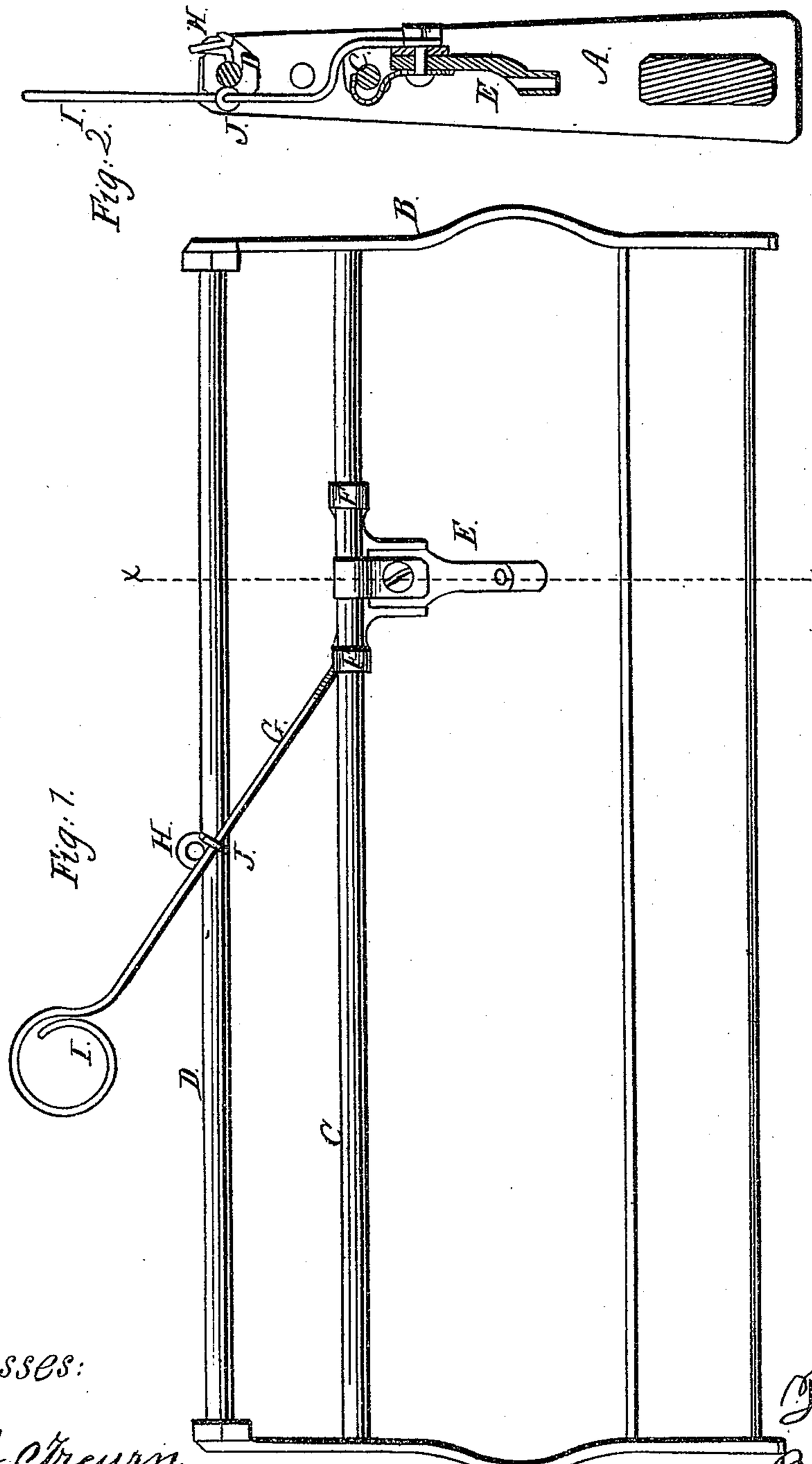
T. Crane.

Knitting Mach. Take-up.

No. 61,608. Patented Jan. 29, 1867.

Fig. 1.



Witnesses:

Wm. Treurn

Alex. A. C. Klaucke

Inventor:

Thos Crane

by Munn & Co

Attys

N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

THOMAS CRANE, OF FORT ATKINSON, WISCONSIN.

IMPROVEMENT IN TAKE-UP MECHANISM FOR KNITTING-MACHINES.

Specification forming part of Letters Patent No. **61,608,** dated January 29, 1867.

To all whom it may concern:

Be it known that I, THOMAS CRANE, of Fort Atkinson, in the county of Jefferson and State of Wisconsin, have invented a new and useful Improvement in Knitting-Machines; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable those skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a front elevation of so much of a knitting-machine as it is necessary to show to illustrate and explain my invention. Fig. 2 is an elevation of a cross-section taken on the line *x* of Fig. 1.

Similar letters of reference indicate corresponding parts.

This invention relates to the yarn-carrier of knitting-machines, particularly to the kind known as "straight frames," wherein the yarn-carrier is made to reciprocate along the row or rows of needles, and it is therefore applicable to machines of the class represented in Letters Patent granted to J. W. Lamb, September 15, 1863.

It consists in combining with the yarn-carrier a take-up whose construction and operation are such that the carrier can be moved the whole length of the frame at each stroke, without reference to the number of needles employed—that is to say, without reference to the width of the work. The take-up lifts the yarn between a stationary eye fixed at or near the middle of the frame and the yarn-carrier at the time the carrier is approaching the middle of the frame, and thereby takes up the slack and draws a fresh supply from the bobbin, which it gives out again as the carrier moves away from the middle of the frame.

A B designate two uprights, which rise from either end of the bed of a knitting-machine, and furnish support to the ends of a horizontal guide-rod, C, upon which the yarn-carrier E is suspended by means of eyes F F, made in the ends of branches, into which the upper part of the carrier is divided, and through which eyes the said rod passes. By this means I am enabled to guide and uphold the yarn-carrier in its reciprocations on the machine. D is another horizontal rod placed above the guiding-rod, and also supported at its ends by the uprights A B.

To the middle of the yarn-carrier, on its back part, I pivot the lower end of the take-up G, composed of a straight arm or rod having an eye, I, formed in its free upper end. This arm passes through an eye, J, connected to the middle of the length of the horizontal rod D, said eye being, in this example, formed on the front end of a short shaft which passes horizontally through the rod D, and is free to revolve. The rear end of said short shaft has an eye, H, formed on it to carry the yarn which comes to it directly from the bobbin.

From this construction it follows that the yarn-carrier, being suspended by its eyes from the guide-rod C, and being free to be moved to and fro along the whole length of said rod, can be driven by any suitable device having positive motion; and when used with a machine of the class before referred to, it can be moved by a driving-dog fastened to the sliding frame, with arms embracing the yarn-carrier, thereby giving reciprocating motion to the carrier by positive means. But I have not thought it necessary to show nor apply such a device in this illustration of my invention, because any skillful mechanic can readily make such application without any particular description.

It will be also observed that when the yarn-carrier is approaching the middle part of its path the take-up arm G is made to advance through the revolving eye J, its eye I receding from the stationary eye H as it rises, and that it is brought to a vertical position when the yarn-carrier is directly beneath the said eye J, at which time the eye of the take-up (designated by the letter I) is at its greatest distance from the eye H on the rod D. As the yarn-carrier leaves the middle part of the rod C, the take-up arm is brought down from its vertical position, its eye approaching the stationary eye H in proportion as the take-up approaches a horizontal position. The yarn comes from a bobbin placed behind the machine, and is passed through eye H; thence through the eye in the top of the take-up; thence through the yarn-carrier down to the needles.

The efficiency of this method of drawing off

fresh and taking up the slack yarn is very great, since it produces or causes little or no friction or strain on the yarn by way of tension or otherwise, and the action of the take-up, as well as of the yarn-carrier, is positive, and resembles the action which would be had by the hand if one, when the slack was to be taken up and fresh yarn drawn from the bobbin, should lift the yarn up out of the way, and then, when it was wanted, should let go of it, and allow it to be fed to the needles with perfect freedom and without restraining its delivery.

I do not intend to confine myself to the devices here shown of taking up or lifting the fresh yarn and the slack, since the same thing can be done by modified and equivalent means requiring only ordinary skill to suggest and apply. When the yarn-carrier has completed its movement toward the right, the take-up will have delivered to it the yarn required to feed the needles; and since the take-up and carrier are connected to each other, the former will have made its nearest approach to the stationary eye H at the moment when the yarn-carrier has reached the point of greatest distance from the middle of the rod C—that is to say, its greatest distance from the vertical plane which passes through the eye H. It results from this operation that the yarn is not drawn off from the bobbin by the movements of the yarn-carrier toward the extreme right or left, but that it is drawn from the bobbin by reason of the elevation of the take-up when the yarn-carrier is approaching the middle of its stroke.

One great advantage derived from this invention is found in its application to straight frames when the knitting is carried on with only part of the row or rows of needles, the advantage being in this, that the yarn-carrier can move the full distance of the stroke of the sliding frame, or other device which drives the yarn-carrier, without any reference to the number of needles in operation, the slack yarn being always taken up by the elevation of the arm G during the first half of the return movement of the carrier. Therefore it is not necessary to make any alterations or adjustments for the purpose of altering the stroke of the yarn-carrier when wide or narrow work is to be knit, but its stroke can remain always of the same length for all descriptions of work.

Instead of making the take-up operate, as shown in this example, directly between the yarn-carrier and a stationary eye, it may be made to work between two stationary eyes; but the mechanical principle will be the same.

A small roll or pulley may be attached to the top of the take-up rod, instead of the eye, if desired, when the yarn would be passed over the roll instead of through the eye I.

I claim as new and desire to secure by Letters Patent—

1. In knitting-machines, an apparatus that lifts the yarn between a stationary eye or its equivalent and the yarn-carrier, or between two stationary eyes, substantially as described, so that the slack is taken up as the yarn-carrier approaches the center of the machine, and is given out as it moves from the center.

2. I also claim the means, substantially as herein described, of lifting the yarn—that is to say, a rod pivoted at one end to the yarn-carrier or to the machine, while its upper part is free to slide through a stationary guide placed near the middle of the machine, or the middle of the stroke of the carrier, substantially as described.

THOMAS CRANE.

Witnesses:
H. A. PORTER,
DWIGHT FOSTER.