(No Model.)

J. D. HEMPHILL.

DRAW CAM FOR STOCKING KNITTING MACHINES.

No. 516,723. Patented Mar. 20, 1894.

Fig. 1

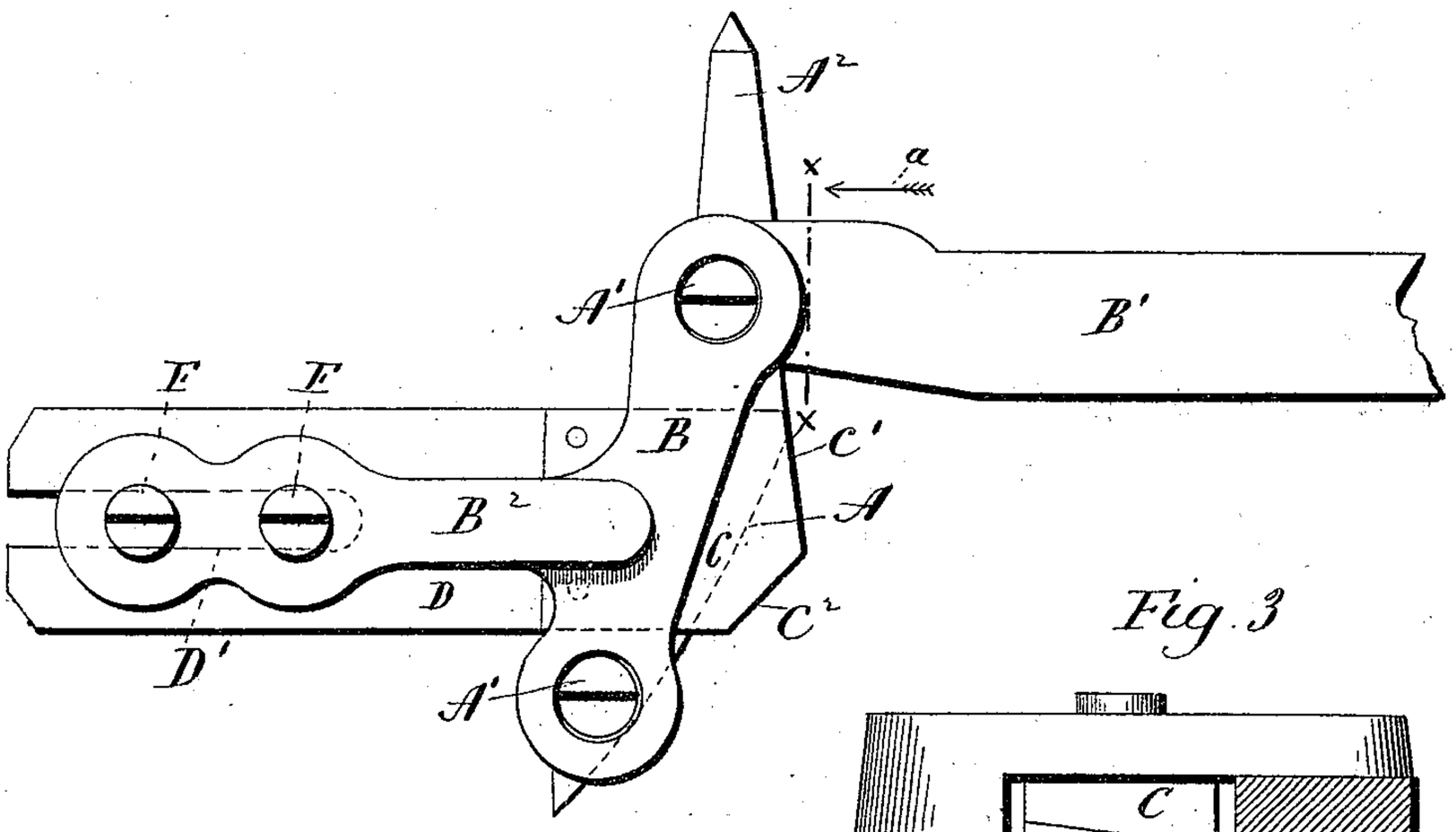

Fig. 2

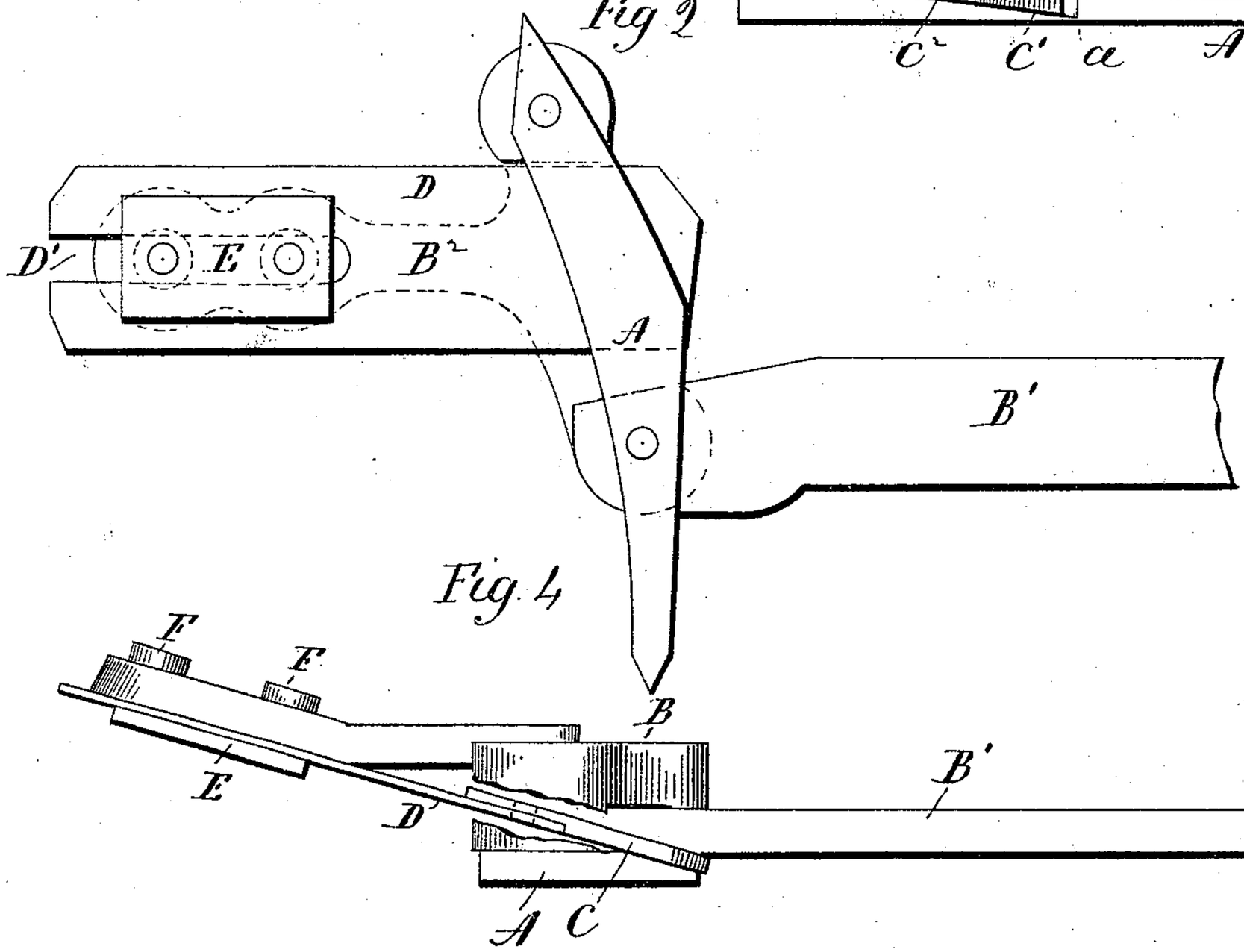

Fig. 3

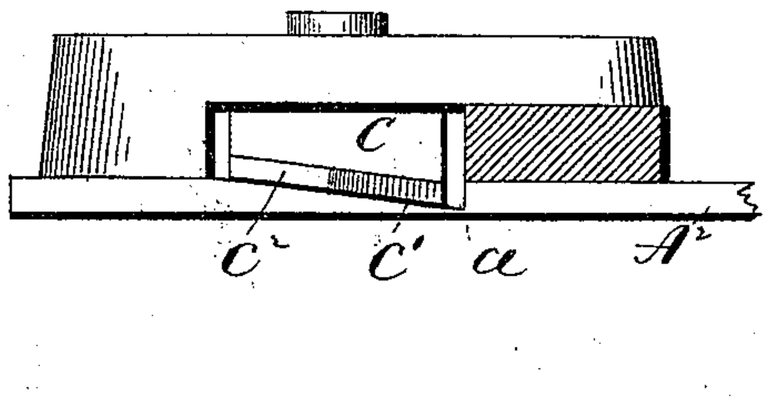

Fig. 4

Witnesses
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DRAW-CAM FOR STOCKING-KNITTING MACHINES.

SPECIFICATION forming part of Letters Patent No. 516,723, dated March 20, 1894.

Application filed July 24, 1893. Serial No. 481,266. (No model.)

To all whom it may concern:

Be it known that I, JOSHUA D. HEMPHILL, of Huntington, in the county of Fairfield and State of Connecticut, have invented a new Improvement in Draw-Cams for Stocking-Knitting Machines; and I do hereby declare the following, when taken in connection with accompanying drawings and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this specification, and represent, in—

Figure 1, a plan view of one form which my improvement may assume; Fig. 2, a reverse plan view thereof; Fig. 3, a view partly in elevation, and partly in section on the line *x—x* of Fig. 1 and looking in the direction of the arrow *a;* Fig. 4, a view of the device in side elevation, with a portion of the body-portion of the slide broken away.

My invention relates to draw-cams for stocking-knitting machines, and more particularly to draw-cams applicable to the machine for which, under date of January 31, 1893, I applied for a patent of the United States, my application having been serially numbered 460,431. In that machine I employ two sinker-cams, arranged to act alternately to lift the sinkers for the formation of the stitches, and slack the yarn of the formed stitches sufficiently to permit the needles carrying the same to pass over the draw-cams on their way to the raise-cams, so that when one of the sinker-cams is operating to lift the sinkers for the formation of the stitches, the other cam is operating to raise the sinkers for relieving the formed stitches, and vice-versa.

The object of my present invention is to provide simple and effective means for relieving the strain upon the stitches after the same have been formed, and while the needles are on their return movement to the raise-cams, in such a manner that the strain on the yarn is reduced to the minimum.

A further object of my invention is to provide devices for the purpose set forth, which shall not be liable to derangement, and which shall be so exposed as to be readily accessible for attention and adjustment.

With these ends in view, my invention consists in a primary draw-cam provided with a yielding secondary draw-cam which co-operates with it to draw the needles when the stitches are being formed, but retires and gets out of the way when the needles are returning to the raise-cams.

My invention further consists in certain details of construction and combinations of parts as will be hereinafter described and pointed out in the claims.

It will be understood, of course, that I employ two draw-cams, each furnished with a yielding secondary cam. Inasmuch, however, as the two cams are duplicates of each other, I shall illustrate and describe only one. Nor shall I illustrate and describe my improved device in connection with a knitting machine, as the use of my invention will be sufficiently understood by referring to my prior application, which shows a machine adapted to receive my present invention.

As shown in the drawings, the primary draw-cam A, is attached by means of screws A′ A′ to the under face of the body-portion B, of a slide, which also comprises a shank B′, which extends outwardly from the inner end of the said body-portion, and a finger B^2, which extends inwardly from about the center of the opposite or inner edge of the same. The said draw-cam slide is mounted in the frame of the knitting machine so as to be moved back and forth therein, to shift the position of the draw-cam as required, and corresponds, generally speaking, to the draw-cam slides illustrated in my prior application. The upper face of the draw-cam is constructed, about midway of its length, with a recess *a*, having an inwardly inclined floor, and receiving the yielding secondary draw-cam C, which, as herein shown, is riveted to the outer end of a flat sheet-metal spring D, the inner end of which is adjustably secured by means of a clampling-plate E, and screws F F, to the inner end of the finger B^2, of the draw-cam slide, the said inner end of the spring being constructed with a longitudinal slot D′, which adapts it to be adjusted back and forth to vary the position of the secondary draw-cam C, with respect to the primary draw-cam A. The said secondary draw-cam projects beyond the outer edge of the primary draw-cam, and is located in a plane slightly in-

clined inward from the horizontal, as shown by Fig. 3 of the drawings, so that in their return movement to the raise-cams, the butts of the needles will strike its under face in such a manner that they will readily lift it and pass under it, whereby the stitches carried by the needles being thus operated, will be relieved of strain in direct proportion to the extent to which the outer edge of the cam projects beyond the outer edge of the primary draw-cam. It will be observed that the outer end of the yielding secondary cam has two inclined faces C′ and C², of which the former is the longer. The longer face C′ co-operates with the longer face A² of the draw-cam to draw the stitch, while the shorter face C², has the function of holding the stitch drawn until after the needle on the longer face C′ has completed its drawing action, for otherwise, out of any two needles, the needle to the rear would rob the stitch carried by the needle in front of it, which is to say, draw the yarn required for the stitch from the forward needle instead of from the yarn-carrier.

With my improved draw-cam having a secondary yielding cam, I preferably employ only one sinker-cam, which swings back and forth according to the direction in which the rotary needle-dial of the machine is moving. Such an oscillating sinker-cam is old, and does not need illustration or description. By means of my improvement I secure all of the slack that is required for the relief of the stitches, so that the yarn will not be broken, even if very fine or tender.

It is obvious that in carrying out my invention, the detailed construction of the slide, the draw-cam and the yielding secondary cam may be changed. I would therefore have it understood that I do not limit myself to the exact construction herein shown and described, but hold myself at liberty to make such changes and alterations as fairly fall within the spirit and scope of my invention.

Having fully described my invention, what I claim is—

1. A draw-cam for a stocking-knitting machine provided with a yielding secondary draw-cam located directly above it, substantially as described, and whereby the yielding secondary draw-cam is adapted to be lifted.

2. A draw-cam for a stocking-knitting machine, provided with a yielding secondary draw-cam having a long and short inclined face, substantially as described.

3. A draw-cam for stocking-knitting machines, having a yielding secondary draw-cam located directly above and extending beyond it, and having an inwardly inclined face, substantially as described.

4. The combination with a slide having an inwardly projecting finger, of a primary draw-cam attached to the said slide, and a yielding secondary draw-cam attached to the said finger, located above and extending beyond the operating face of the primary draw-cam, substantially as described.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

JOSHUA D. HEMPHILL.

Witnesses:
E. W. KNEEN,
S. H. SESSY.