

(No Model.)

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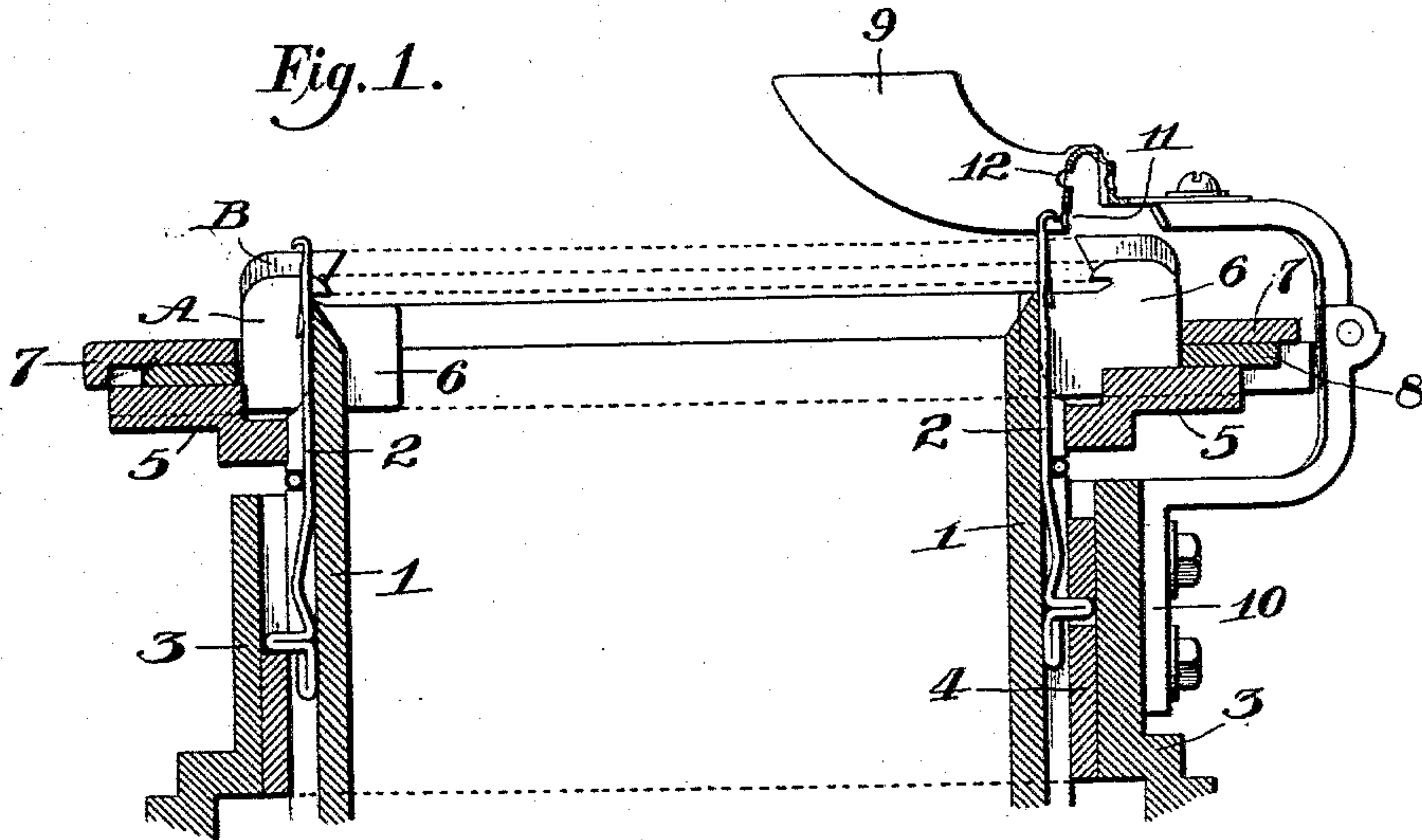
J. L. BRANSON.

LOOP EXTENDING MECHANISM FOR KNITTING MACHINES.

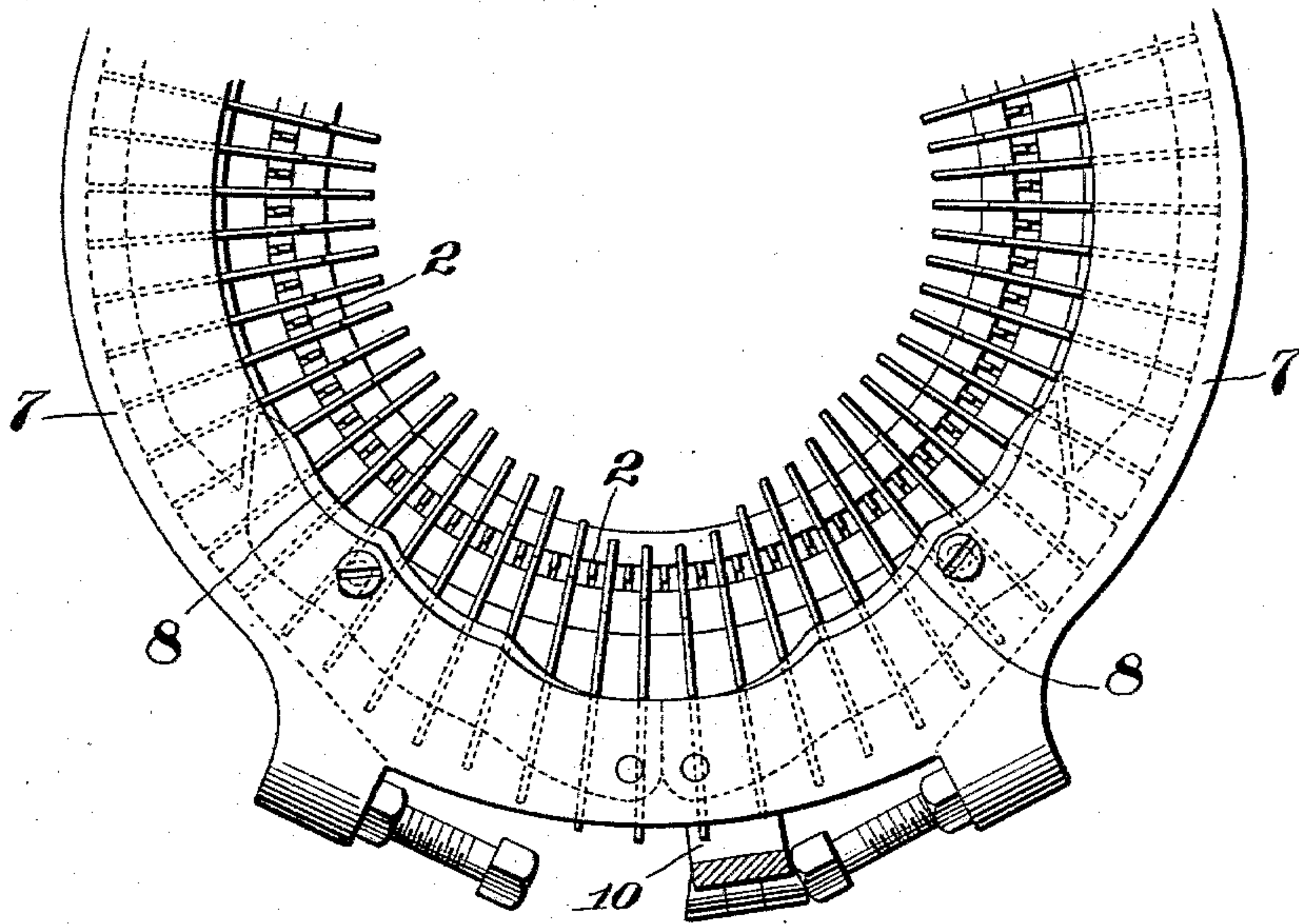
No. 551,346.

Patented Dec. 10, 1895.

*Fig. 1.*



*Fig. 2.*



Witnesses.

Andrew H. Gouge  
Ira S. Keller

Inventor.

James L. Branson  
per John T. Nolan  
Attorney.

(No Model.)

2 Sheets—Sheet 2.

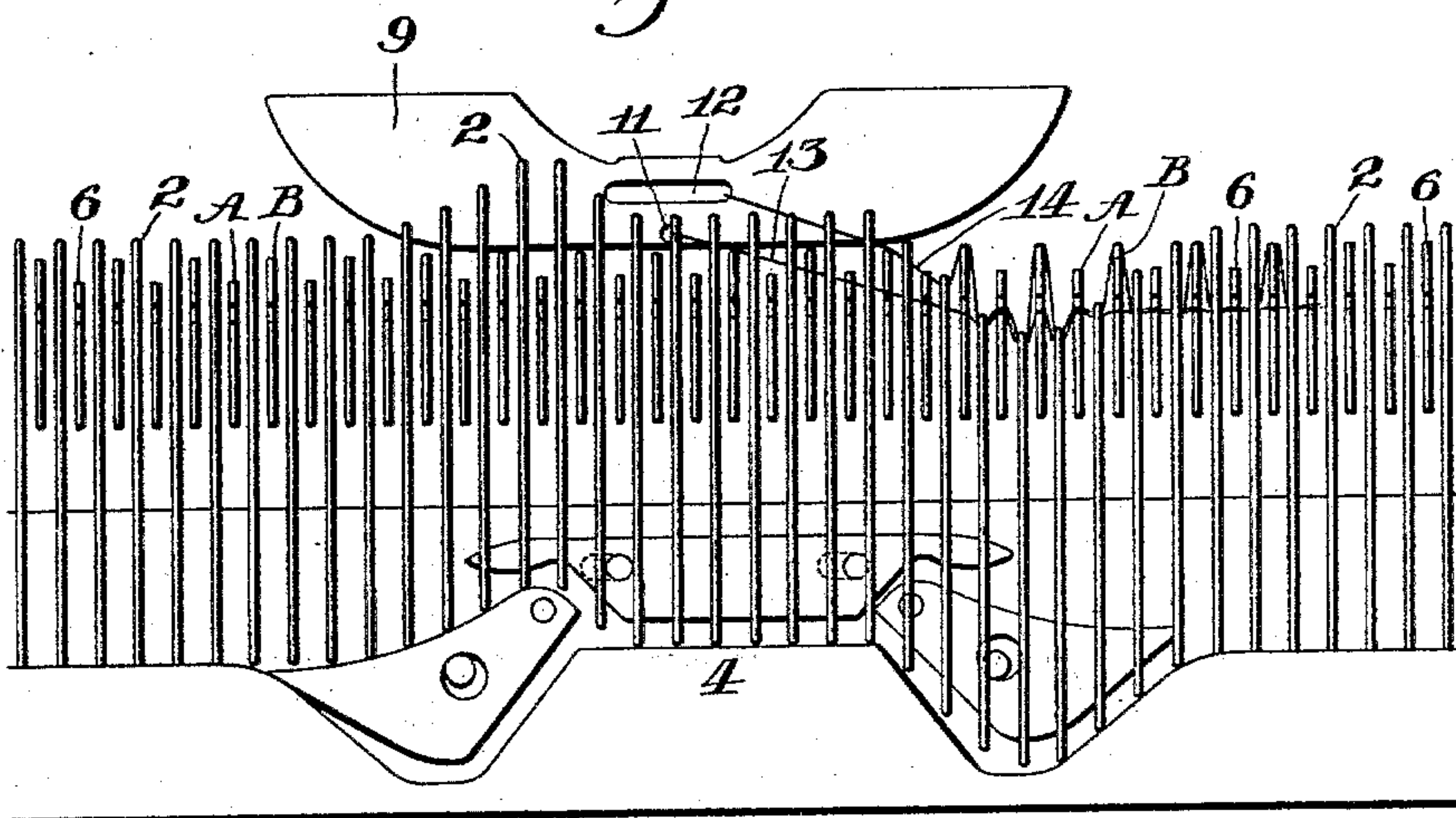
J. L. BRANSON.

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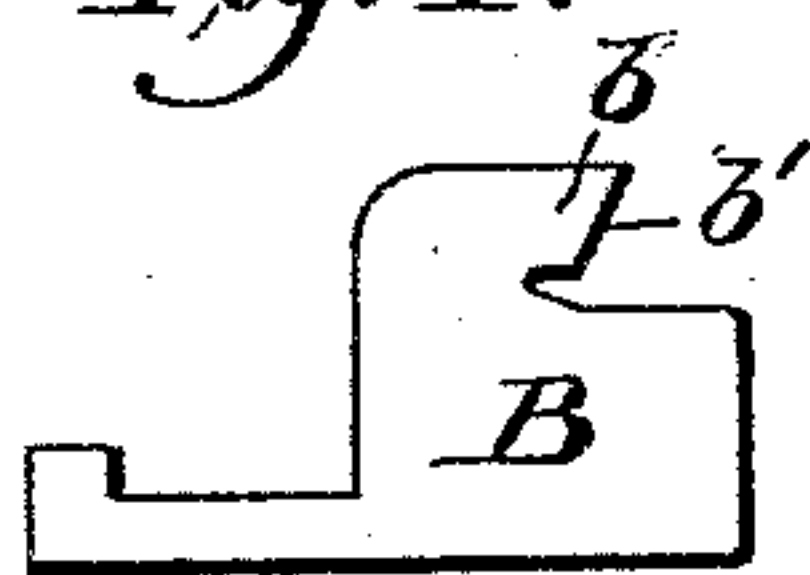
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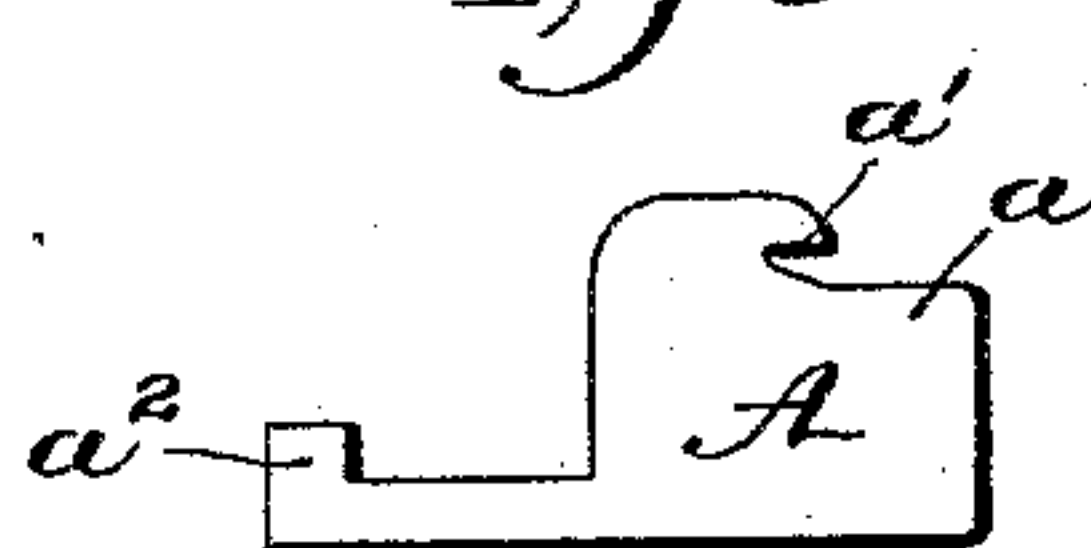
*Fig. 3.*



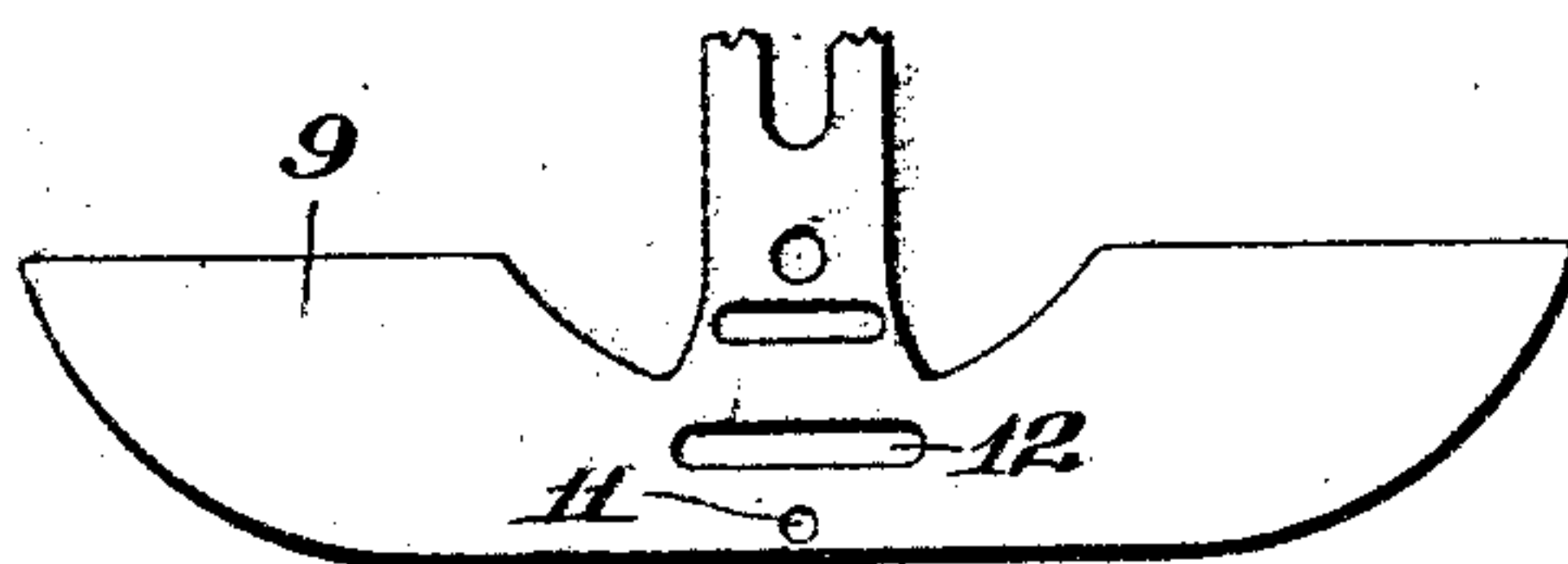
*Fig. 4.*



*Fig. 5.*



*Fig. 6.*



Witnesses.

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# UNITED STATES PATENT OFFICE.

JAMES L. BRANSON, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO THE  
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## LOOP-EXTENDING MECHANISM FOR KNITTING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 551,346, dated December 10, 1895.

Application filed April 24, 1895. Serial No. 546,976. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES L. BRANSON, a citizen of the United States, residing at the city and county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Loop - Extending Mechanism for Knitting-Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

In circular-knitting machines wherein a plain or single web is produced there are sometimes employed sinkers or web-holders which are constructed and operated to hold down the successive stitches during the upward strokes of the reciprocating knitting-needles, and to feed forward the fabric as rapidly as it is produced. In those machines wherein elongated loops are formed on the inner face of the web separate threads are employed for the main or body portion and for the looped portion of the fabric, the loops of such latter portion being produced by means of bits or fingers which alternate with the needles in a manner to receive the alternate loops and to support them during the descent of the needles. Heretofore in the last-named class of machines, owing to their peculiar construction and mode of operation, sinkers have not been used, but instead the usual take-up weights have been suspended from the web being knit. In the absence of sinkers in such machines it has been very difficult to effect a uniform knitting of the loop-faced web, the additional or loop thread frequently escaping the needles, or the loop-extending bits, or both, particularly in reciprocating work.

In order to obviate the defects just stated, I have devised a novel and efficient construction and arrangement of sinker and loop-extending mechanism and coacting thread-feeding device, which will be hereinafter fully described and claimed, reference being had to the annexed drawings, in which—

Figure 1 is a vertical section through the head of a circular-knitting machine in which my invention is embodied. Fig. 2 is a plan thereof. Fig. 3 is a diagram illustrating the relative positions of the needles, the sinker and loop-extending devices, the thread-feed,

and the knitting-cams. Fig. 4 is an elevation of one of the combined sinker and loop-extending devices. Fig. 5 is an elevation of one of the sinkers. Fig. 6 is a partial development of the yarn-guide.

The numeral 1 designates the needle-cylinder in which are contained the circular series of vertically-reciprocative needles 2; 3, the rotatable ring or cylinder which carries the knitting-cams 4 for actuating the needles; 5, the radially-grooved sinker-supporting bed affixed to the needle-cylinder; 6, the radially-reciprocative sinkers which alternate with the needles, and 7 the rotatable sinker cam-ring which is superimposed on the sinker-bed in a manner to coact with the sinkers.

In pursuance of my invention there are two sets of sinkers, which are, in this instance, disposed alternately in the sinker-bed, although their order of arrangement may be varied to meet special requirements. The sinkers A of one set are or may be of ordinary construction, comprising each a thin blade provided with a tail or web-supporting portion *a*, an overhanging hook, or stitch-engaging portion *a'*, and a lug, or cam-engaging portion *a*<sup>2</sup>. The tail is fitted to a radial groove or way in the top of the needle-cylinder, while the body of the blade is fitted to a corresponding groove in the annular bed 5, the lug *a*<sup>3</sup> extending into the path traversed by the sinker-actuating cams 8 in the rotatable ring 7. The sinkers of the other set B are or may be identical with those just described, save that the top of the overhanging hook is extended upward to form a supplemental loop-supporting portion *b*, the operation of which will hereinafter appear.

The numeral 9 designates the thread-guide, the same being supported in respect to the needle-hooks by the usual post 10 which is affixed to the cam-cylinder. This guide is provided with two eyes 11 12 therein for the passage of the two threads 13 14, respectively, 13 being the main or body thread, and 14 the additional or loop thread. The upper eye 12 is elongated or slotted in respect to the lower eye, so that during the traverse of the cylinder in either direction, whether in the knitting of tubular or fashioned work, the loop-thread will be fed rearward of the main thread to secure its proper introduction to



the needles and sinker devices. So far as the main thread is concerned, it is caught by the successive needles in the usual manner and acted upon thereby to form the stitches which constitute the body of the fabric, the hooks of the successive sinkers in both sets engaging the web as ordinarily. On the other hand, the loop-thread, by reason of the angle at which it is fed to the needles, is only engaged by the hooks of the alternate sinkers A, the intermediate wales being drawn by the descending needles upon the high portions *b* of the sinkers B in a manner to form extended loops—that is to say, while the thread is in the grasp of one descending needle during the formation of a stitch, the thread as it extends from the hook of that needle to the thread-guide rests upon the raised portion of the adjacent sinker B, and hence in the descent of the succeeding needle the wale is drawn upon such raised portion with the effect stated. In the formation of the next stitch, the loop-thread is combined with the main thread in the knitting of the body of the fabric, and the plane-sinker acts upon the stitch in the usual way. Thus the extended loops are formed in alternate stitches of each course. By varying the positions of the two sets of sinkers the order of the loops may be changed.

The nose *b* of the loop-extending portion of each of the sinkers B is beveled inwardly from the top to the notch or stitch-engaging portion, as indicated at *b'*, so that during the inward movement of the sinker the main thread will be directed downward to the tail of the sinker instead of being pressed inward and strained, as would otherwise be the case. When the sinkers are retracted by the sinker-cams during the knitting of the successive courses, the loops are cast off the raised portions of the sinkers, and during the inward movements of the sinkers the looped courses are progressively fed forward with the body of the fabric.

The sinker-actuating cams 8 in the ring 7 are substantially the same as the like parts set out in Letters Patent of the United States No. 464,313, dated December 1, 1891, save that the contour of their inner edges is varied slightly, as shown in Fig. 2, to effect the proper inward throw of the two sets of sinkers in respect to the needles. The said ring is actuated similarly to the construction shown in said patent—that is, the yarn-guide post, during the rotation or the reciprocation of the cam-cylinder, coacts with lugs or projections on the cam-ring.

In order to effect the requisite movement of the needles to secure the proper engagement of the threads thereby at the proper time, I expand the knitting-cams longitudinally—that is, I elongate the central cam and thus increase the distance of the lateral stitch-cams from the thread-guide. This construction is necessitated by the different feeding-angles of the two threads, such different an-

gles being requisite to insure the proper working of the threads in respect to the sinkers to attain the end in view.

I claim—

1. In a knitting machine, the combination, with the needles, their supporting and operating parts, and means for feeding a plurality of threads to the needles, of sinkers provided with stitch-engaging and loop-extending portions, the stitch-engaging portions being constructed to engage the main thread and the loop-extending portions being constructed to receive the other or loop-thread, substantially as described.

2. In a knitting machine, the combination, with the needles, and their supporting and operating parts, of two sets of sinkers, one set being provided with stitch-engaging portions and the other set being provided with stitch-engaging and loop-extending portions, and means for operating said sinkers, substantially as described.

3. In a knitting machine, the combination, with the needles and their supporting and operating parts, of two sets of alternating sinkers, one set being provided with stitch-engaging portions and the other set being provided with stitch-engaging and loop-extending portions, substantially as described.

4. In a knitting machine, the combination with the needles, their supporting and operating parts, and a thread-guide provided with two thread-feeding eyes, one of which is elongated, as described, of two sets of sinkers, whereof one set is provided with stitch-engaging portions and the other set is provided with stitch-engaging and loop-extending portions, together with means for operating said sinkers, substantially as described.

5. In a knitting machine, the combination, with the needle cylinder, its needles, the cam carrier, the cams therein extended as described, and a thread guide provided with two thread feeding eyes one of which is elongated, of radially movable sinkers provided with stitch-engaging and loop-extending portions, and means for operating said sinkers, substantially as described.

6. The described sinker and loop extender provided with a tail or wale-supporting portion, a hook or stitch-engaging portion, and a raised or loop-extending portion, substantially as described.

7. The described sinker and loop-extender provided with a tail, or wale-supporting portion, a hook, or stitch-engaging portion, and a raised or loop-extending portion with an inwardly beveled nose, substantially as described.

In testimony whereof I have hereunto affixed my signature in the presence of two subscribing witnesses.

JAMES L. BRANSON.

Witnesses:

JOHN R. NOLAN,

ANDREW V. GROUPE.