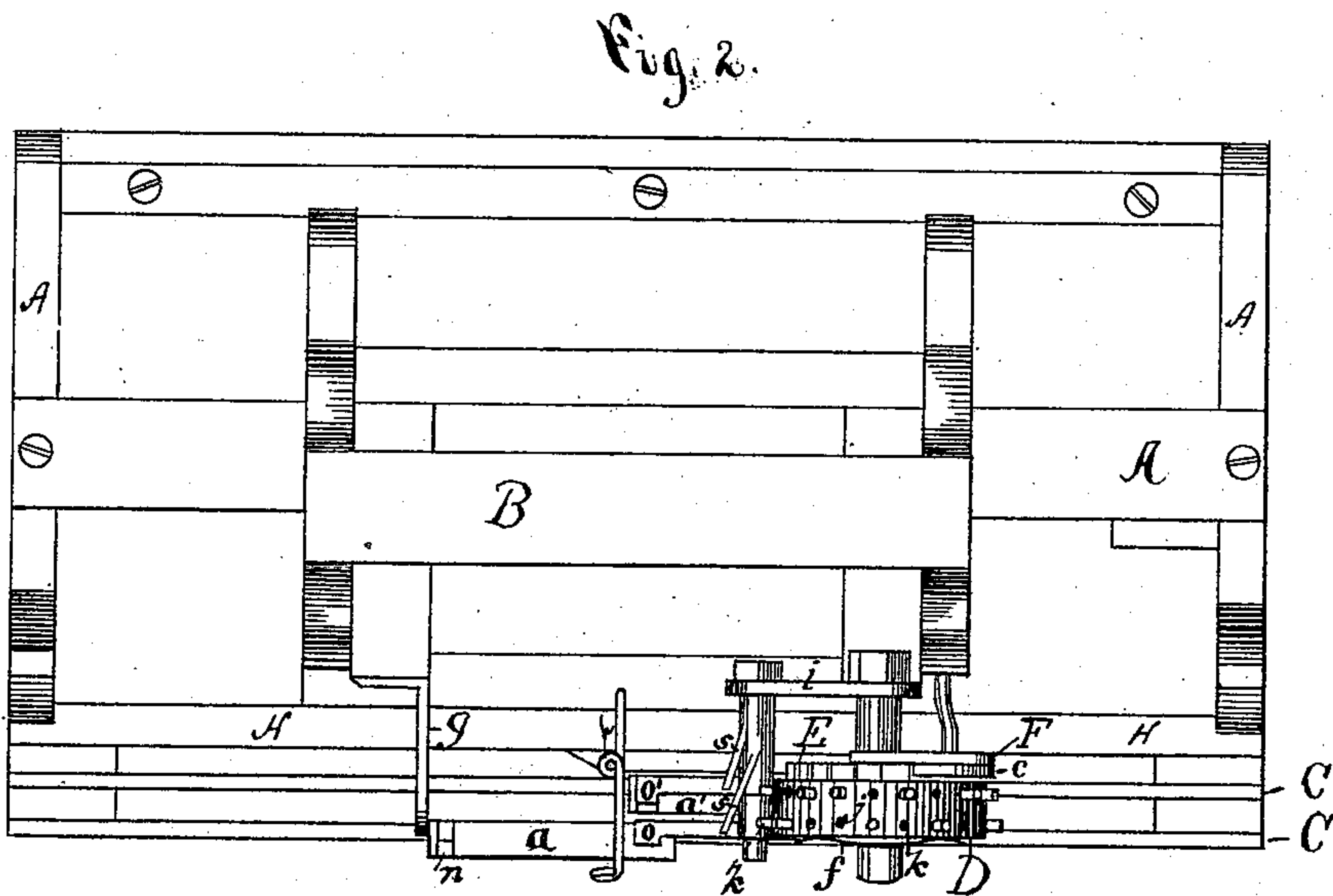
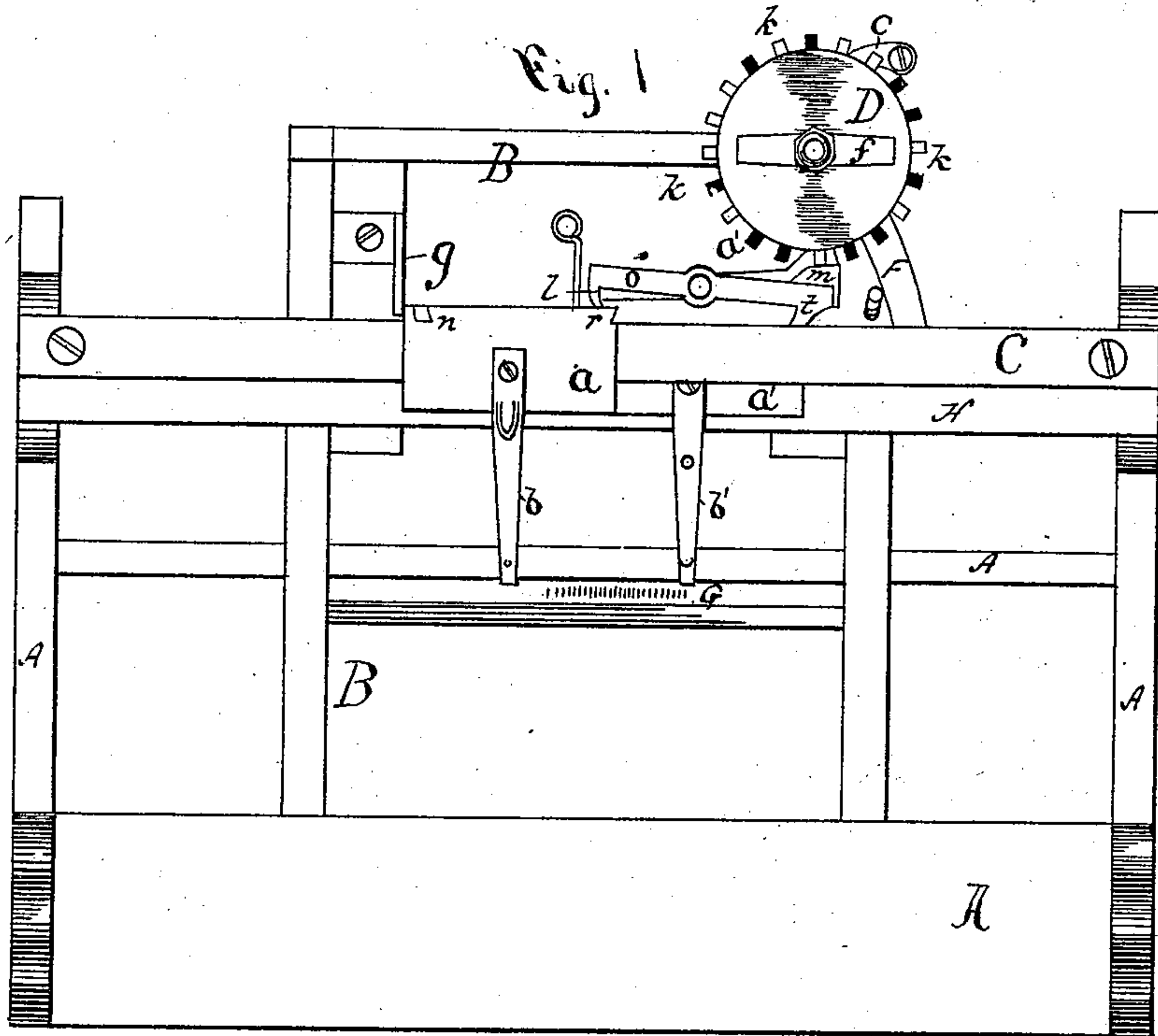


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Knitting Machines.

No. 230,533.

Patented July 27, 1880.



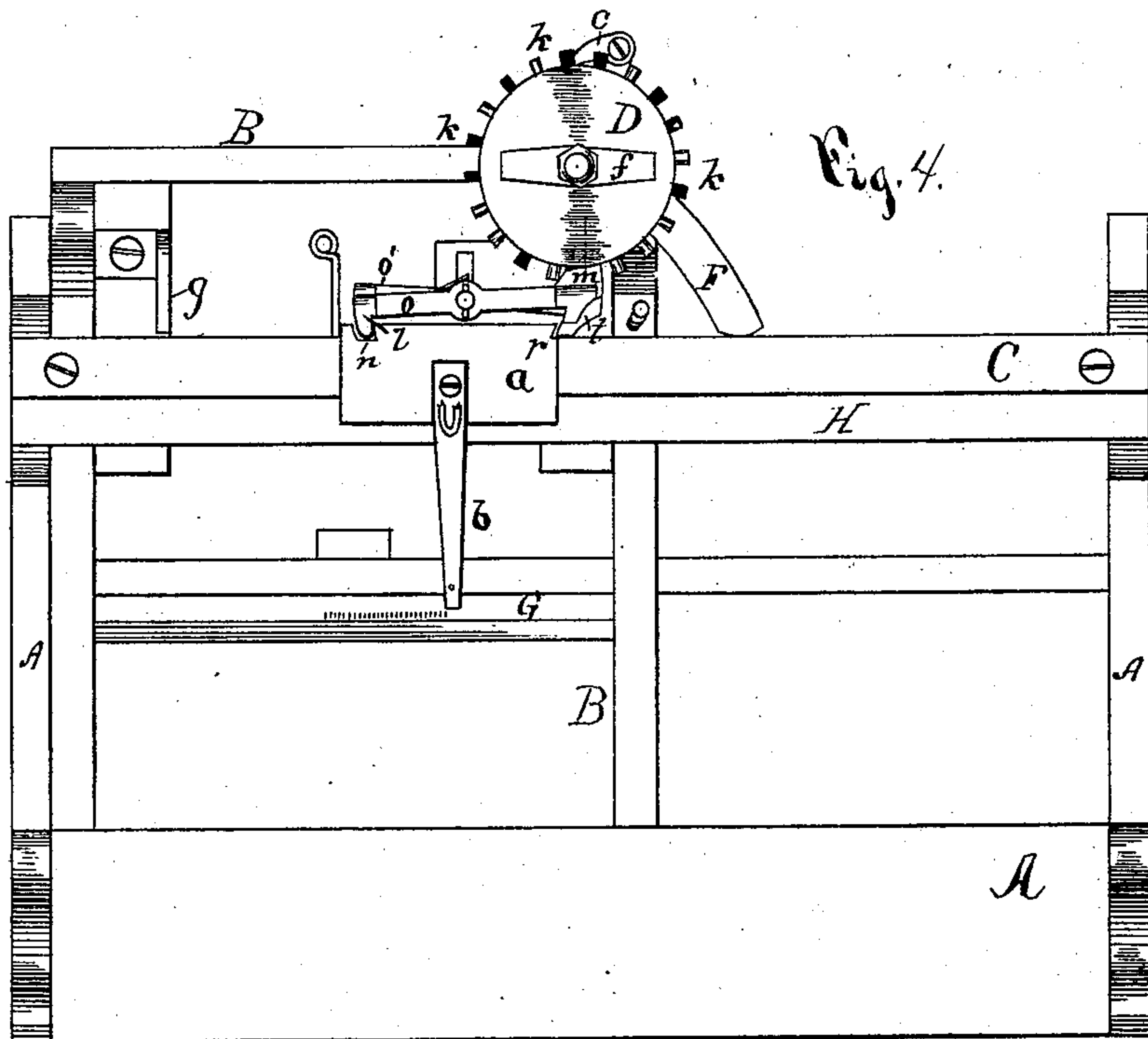
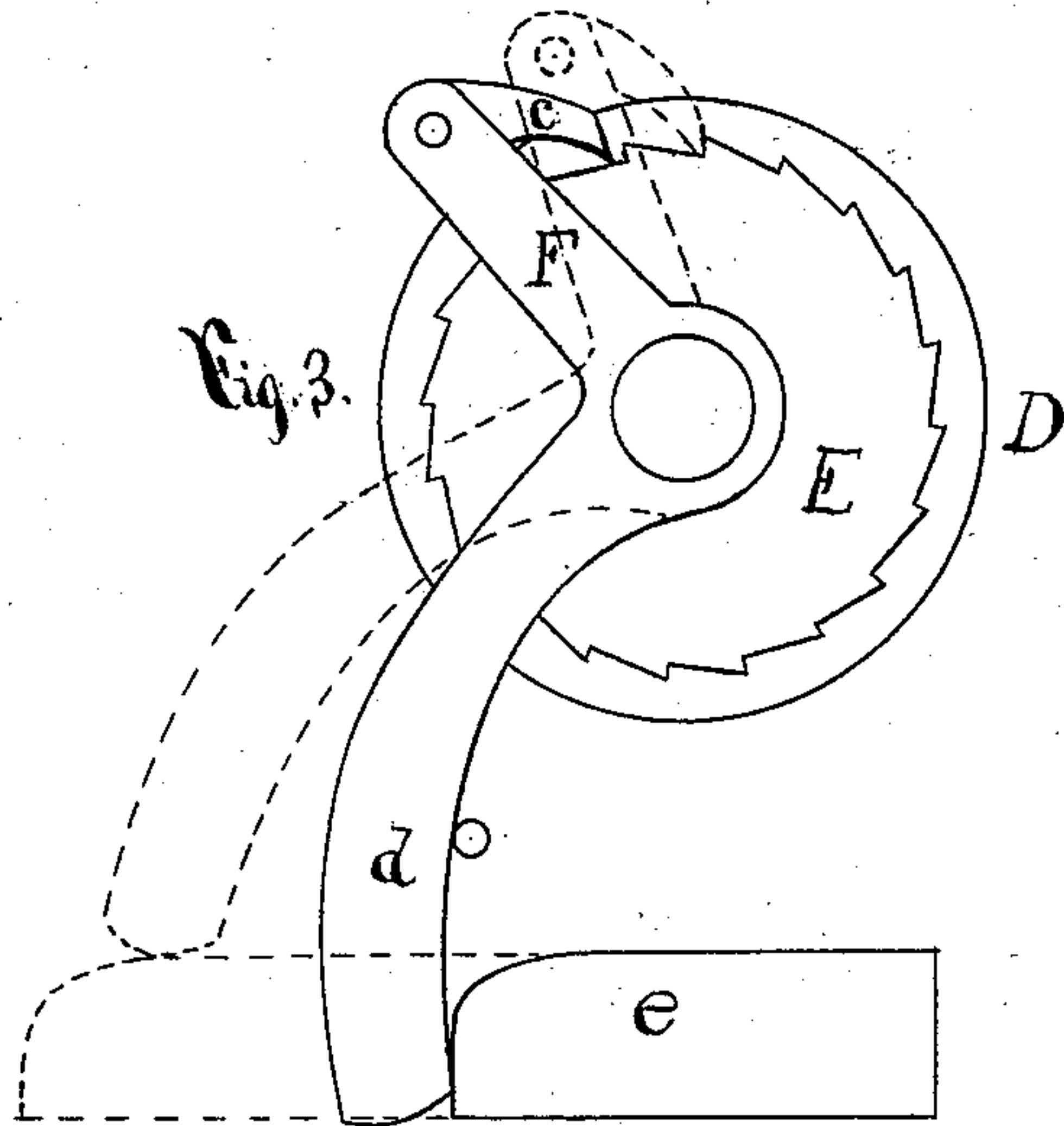
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# UNITED STATES PATENT OFFICE.

ALPHEUS A. DENNETT AND GEORGE H. HOLMES, OF NEW BRITAIN, CONN.,  
ASSIGNORS TO NEW BRITAIN KNITTING COMPANY, OF SAME PLACE.

MECHANISM FOR OPERATING THE THREAD-GUIDES OF STRAIGHT-KNITTING MACHINES.

SPECIFICATION forming part of Letters Patent No. 230,533, dated July 27, 1880.

Application filed November 29, 1878.

*To all whom it may concern:*

Be it known that we, ALPHEUS A. DENNETT and GEORGE H. HOLMES, both of New Britain, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Mechanism for Operating the Thread-Guides of Straight-Knitting Machines for Knitting Striped Work, of which the following is a specification.

This invention is in the nature of an improvement in knitting-machines; and the invention consists, in a knitting-machine, of a reciprocating carriage having needles fixed thereto, in combination with two or more sliding blocks having thread-guides attached to them, and pivoted latches with hooked ends to engage with said blocks, and a pattern-wheel having holes and pins to operate said latches, and a pawl and ratchet and lever to operate said pattern-wheel, and a fixed cam to operate said ratchet, all combined and arranged in the manner and for the purpose hereinafter more particularly set forth.

In the accompanying drawings, Figures 1 and 4 are front elevations of a knitting-machine which embodies our invention. Fig. 2 is a plan view of the same, and Fig. 3 is a rear view of detached parts.

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

This invention is more particularly applicable to what is known as the "Kilbourn knitting-machine."

In the drawings, A represents the frame of a knitting-machine, and B a reciprocating carriage carrying the needles and sinkers, all of which are old, and need not therefore be particularly described.

To the frame A, at its front and near the upper part of the same, or, more properly, to the sinker-bar H, are secured, in any desirable manner, two or more parallel bars of metal, C C, which bars extend lengthwise with the sinker-bar H. Upon these bars are fitted blocks *a a'*, one block upon each bar, and so fitted that the blocks may freely slide on the bars in the direction of their length. To these blocks *a a'* are fixed thread-guides *b b'*, these thread-guides extending from the blocks to or near the needles G, affixed to the reciprocating car-

riage B, each of the blocks *a a'* having fixed to it one of these thread-guides.

To the reciprocating carriage B, and near the upper portion thereof, is secured a bracket, *i*, and to this bracket is attached a barrel or wheel, D, with series of holes *j* formed around its periphery, and with pins *k* inserted into more or less of these holes. This wheel D, for convenience, we will call a "pattern-wheel." The number of holes *j* in the periphery of this wheel, or, more properly, the number of rows of holes in the wheel, will depend upon the number of sliding blocks *a a'* which are used with the machine. There should be one row of holes for each sliding block. In the drawings two rows of holes, with their accompanying pins, are shown in connection with a machine having two sliding blocks.

Rigidly fixed to the rear side of the pattern-wheel D is a ratchet-wheel, E, and also a bell-crank lever, F, to the shorter and upper end of which is secured a pawl, *c*, arranged to engage in the teeth of the wheel E, the lower or longer end, *d*, of this lever extending downward between the rearmost of the bars C C and the sinker-bar H of the machine. To this sinker-bar, and between it and the bars C C, is fixed a stationary cam, *e*. This cam, pawl, bell-crank lever, ratchet, and pattern-wheel are shown in the detail rear view, Fig. 3, in which figure the full lines represent the pawl and the lever to which it is affixed, and the dotted lines represent the position of the pawl and its lever after it has been acted upon in the manner hereinafter described.

To the bracket *i*, before named, but slightly in advance of and below the pattern-wheel D, are secured, so that they may oscillate thereon, oscillating levers or latches *o o'*. The rear ends of these levers extend immediately beneath the pattern-wheel D, and their front ends are in advance of said wheel. To the front ends of these oscillating levers *o o'* are fixed downward projections *l*, and to their rear ends are also fixed similar projections *t*, together with striking-plates *m*, extending upward. These striking-plates have their upper edges curved to the radius of the pattern-wheel D, and the length of these upper edges should be somewhat greater than the space between



any two adjoining holes  $j$  in the same row in the periphery of the wheel, but less than the distance between any adjoining three of said holes.

5 Into the sliding blocks  $a a'$ , on their upper surface and at or near their front ends, are formed notches  $n$ , and the rear ends of these blocks are also notched, as at  $r$ . Each of the oscillating levers  $o o'$  is provided with a spring,  
10  $s$ , which bears upon their upper surfaces.

Now, our improved knitting-machine being constructed substantially as we have hereinbefore described it, it is operated as follows: As the carriage B is moved from right to left  
15 the projection  $t$  in one of the oscillating levers  $o o'$  is hooked over the rear end of one of the sliding blocks  $a a'$ , and the block so engaged is compelled to slide along one of the bars C C, to which it is fitted, and when the sliding  
20 block has in this way advanced as far as the movement of the carriage B will permit it the longer end  $d$  of the lever F is brought in contact with the fixed cam  $e$ , which causes the end of this lever to be raised and the pawl  $c$   
25 at the upper end of the lever to engage in the teeth of the wheel E, forcing around the pattern-wheel D until the striking-plate  $m$  at the rear end of one of the oscillating levers is permitted to enter the space between two of the  
30 pins  $k$  in the periphery of the wheel D, when, by the action of the spring  $s$ , the front end of the oscillating lever  $o$  or  $o'$  is pressed downward and the projection  $l$  at its end forced into the notch  $n$  in the upper surface of the sliding  
35 block; and when in this way engaged the block is carried backward, or from left to right, by the return sliding of the carriage B. The engagement of the hooked front end of the oscillating lever with the front end of the sliding  
40 block continues until the blocks have arrived to the extent desired of their backward movement and until they are again advanced to some extent on their forward movement, when the lower and longer end,  $d$ , of the lever F is  
45 brought in contact with the stationary cam  $e$ , which raises the lower end,  $d$ , of the lever, forcing the pawl  $c$  to engage with a tooth in the ratchet-wheel E, thereby causing the pattern-wheel to turn on its bearing until one of  
50 the pins  $k$  in the periphery of this wheel is brought in contact with the striking-plate  $m$  at the rear end of the oscillating lever, thereby depressing the rear end of the lever and raising its front end so that its hooked projec-  
55 tion  $l$  is forced out of the notch  $n$  in the front end of the sliding block, which releases the block entirely from the action of the oscillating lever, causing it to remain for a time stationary on its slide-bar, which stationary position it maintains until a striking-bar,  $g$ , which  
60 is fixed to the carriage B, is, by the motion of the carriage, brought in contact with the front end of the sliding block, when the block by this means is forced backward to some extent  
65 until the next forward movement of the carriage B causes the rear projection,  $t$ , of the os-

cillating levers to be brought in contact with the rear end of the sliding blocks  $a a'$ , thereby carrying the blocks with the carriage forward to the extent of the forward movement,  
70 when the operation of the pattern-wheel D causes the hooked front end of the oscillating levers to again enter the notch  $n$  in the front end of the sliding block, to be thereby carried back on the return of the carriage B, and in  
75 this way are the sliding blocks caused to slide forward, remain stationary, and slide backward on the bars C C, the time within which this backward-and-forward movement and stationary position of the sliding blocks  $a a'$  takes  
80 place being governed entirely by the interval between the pins  $k$  in the periphery of the pattern-wheel D, since, as is obvious, the greater the space between any adjoining two of the pins the longer will be the interval of engage-  
85 ment of the oscillating levers with the sliding blocks, for, as before stated, the disengagement is effected only by the contact of these pins with the rear ends of the oscillating levers. Hence it is clear that since these slid-  
90 ing blocks  $a a'$  carry in their movement the thread-carriers  $b b'$ , the length of time during which the carriers deposit their thread on the needles to be knitted is regulated entirely by the space or intervals existing between the  
95 pins  $k$  on the pattern-wheel D.

Now, in constructing the machine with two or more sliding blocks,  $a a'$ , and two or more oscillating levers,  $o o'$ , and two or more rows  
100 of pins,  $k$ , on the periphery of the pattern-wheel D, it is evident that the sliding motion of these several blocks may be regulated by means of the pins  $k$  before referred to, so as to move or slide together, or to alternate in  
105 their motion, one remaining stationary while the other is advanced, or is moved backward or forward, or one remaining stationary for any given interval while the other is advanced. By this alternate movement of two or more of these  
110 sliding blocks with their respective thread-carriers attached, it will be readily seen that the sliding block, with its thread-carrier, which, if you choose, carries the thread from which the body of the fabric is to be knitted, may pass  
115 to and fro, depositing its thread on the needles, until a given quantity is knitted, and then remaining stationary until a second sliding block, with its carrier, conveying a thread of  
120 different color, deposits its thread on the needles, to be knitted into the fabric; and the second carrier then being stationary and the first again being put in motion, the fabric will be knitted in alternate stripes of two different  
125 colors; and if three or more sliding blocks and carriers are in this way actuated, each carrier conveying a thread of different color, the fabric will be knitted throughout in alternate stripes of as many different colors as there are  
130 thread-carriers to convey the different-colored threads, breaking up in this way the uniform color of the fabric and producing a pleasing variety, the space between the several stripes



of different colors being dependent upon and regulated entirely by the position of the pins *k* in the periphery of the wheel D.

As the carriage B moves backward on its return, the longer end, *d*, of the lever F is freed from the action of the fixed cam *e*, and by its weight or gravity causes the pawl *c* to be moved in position for its next engagement with the ratchets in the wheel E, for the purpose of rotating the pattern-wheel D.

A friction-spring, *f*, on the front of the pattern-wheel D bears against it to prevent an accidental movement of the same.

It is designed, as before stated, to supply the thread-guides with yarn of different shades or colors, and the thread running to the rear guide is fed through the eyes *h* on the carriage B and down on the back side of both of the bars C C into the guide proper, *b*.

In case it is desired at any time to knit a continuous length all of one color, it is only necessary to throw back the pawl *c* to disengage it, when the sliding block, which is left free, will alone supply the thread so long as may be desired.

We are aware that knitting-machines have been provided with two or more thread-guides mounted on sliding bars and provided with a latch and mechanism for automatically engaging and disengaging said latch, and different thread-guides to carry the same, with the latch and frame to which it is mounted, back and forth in front of needles set in a stationary frame.

What we claim as new, and desire to secure by Letters Patent, is—

1. The combination, in a flat-knitting machine, of the reciprocating carriage B, bearing

needles, the latches or levers *o o'*, pattern-wheel D, ratchet-wheel E, pawl *c*, bell-crank lever F, all mounted on and reciprocating with said carriage, the stationary cam *e*, and sliding blocks bearing thread-guides, substantially as and for the purposes described.

2. In a flat-knitting machine, the oscillating latches having a downward projection upon each side of their pivot and hung upon a reciprocating carriage, in combination with mechanism for operating said latches and the sliding blocks bearing thread-guides, one downward projection of the latch acting to engage the inoperative blocks and move them, with the carriage, the whole distance traversed by it, and the other downward projection acting as a stop to take up the operative sliding block and move it a fractional part only of the distance traversed by said carriage, substantially as described, and for the purpose specified.

3. In a knitting-machine, the combination of sliding blocks carrying thread-guides, a pattern-wheel with pins and pin-holes therein, two or more oscillating levers or latches, one end of which is provided with a striking-plate with curved or inclined edge, the length of which edge is somewhat more than the distance between two adjoining pin-holes in the pattern-wheel, but less than the distance between any three contiguous holes in the same row, substantially as described, and for the purpose specified.

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