

(No Model.)

2 Sheets—Sheet 1.

H. MEIER.

AUTOMATIC TAKE-UP FOR KNITTING MACHINES.

No. 433,251.

Patented July 29, 1890.

fig. 2.

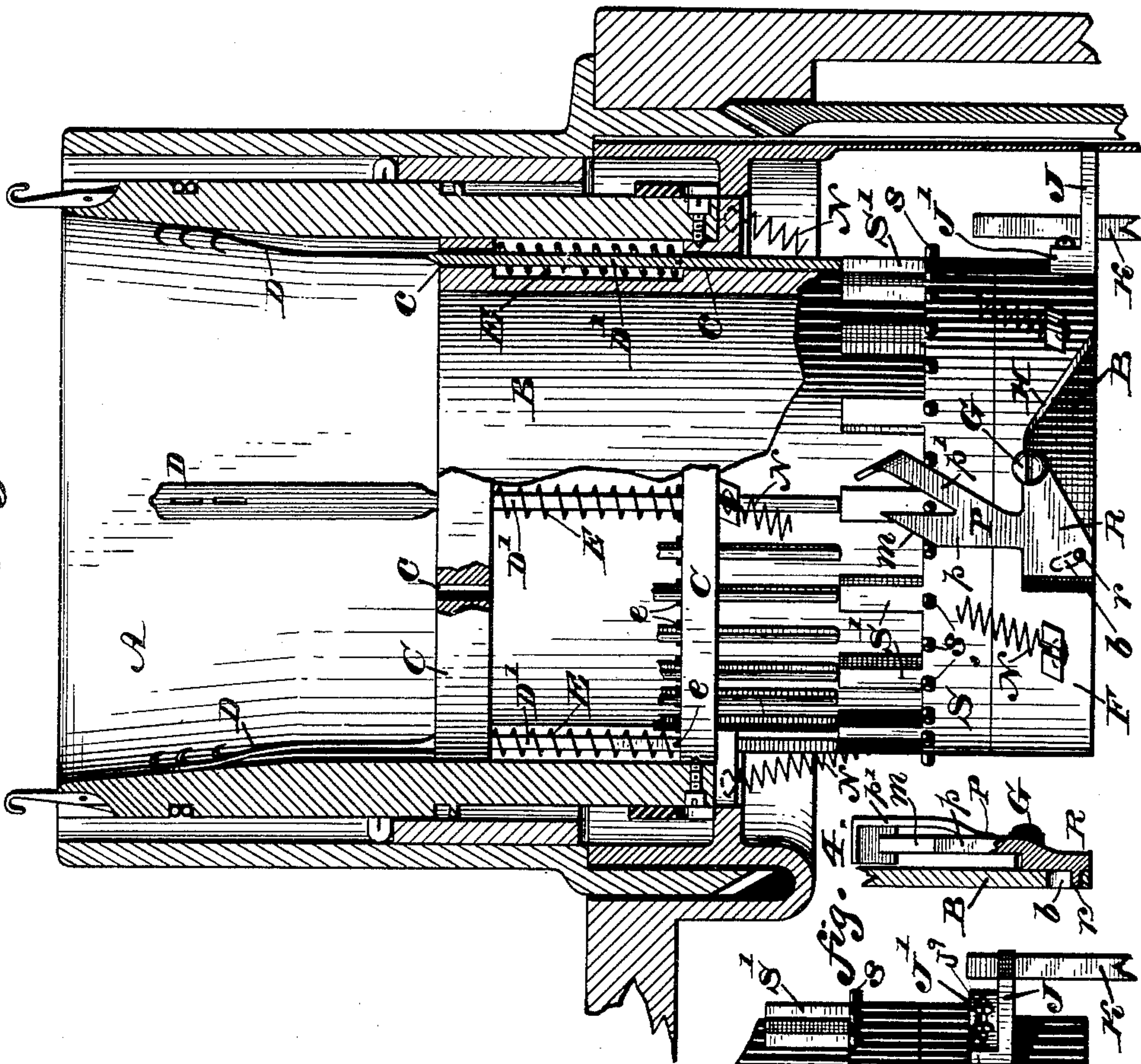
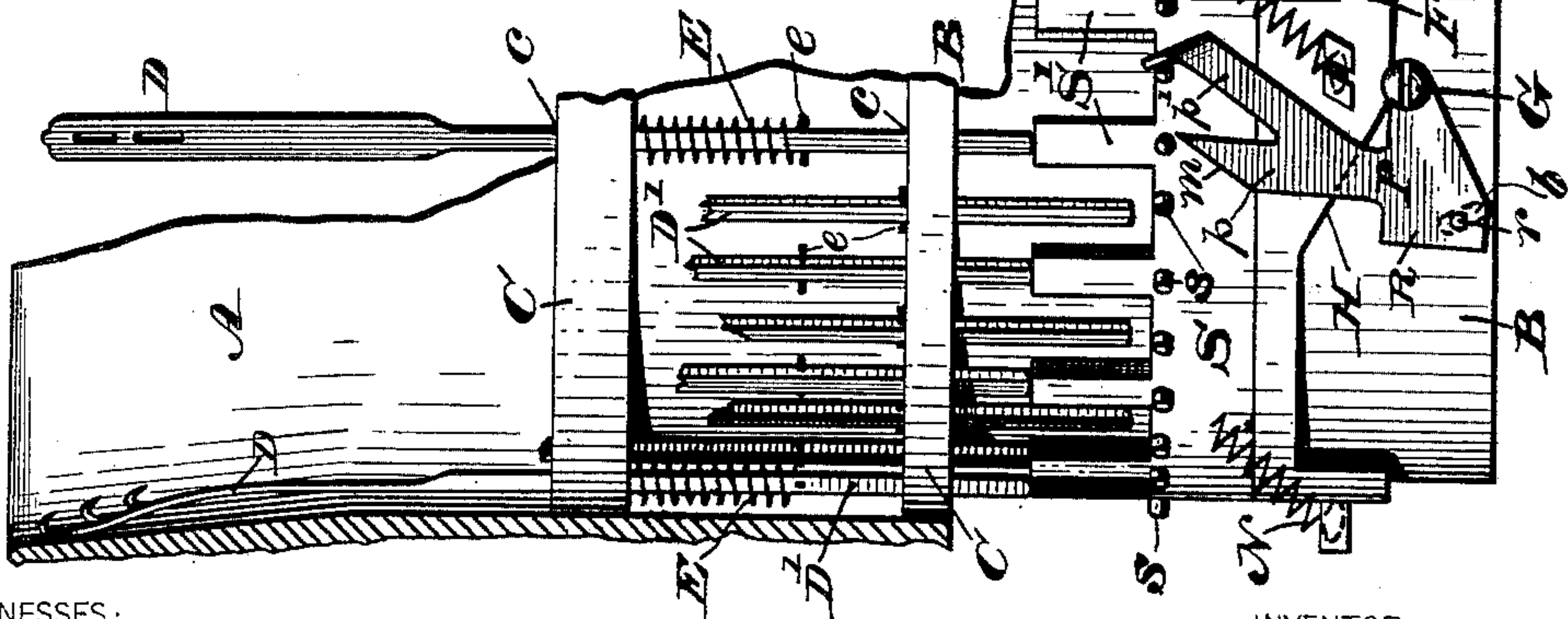


fig. 1.



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INVENTOR:

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2 Sheets—Sheet 2.

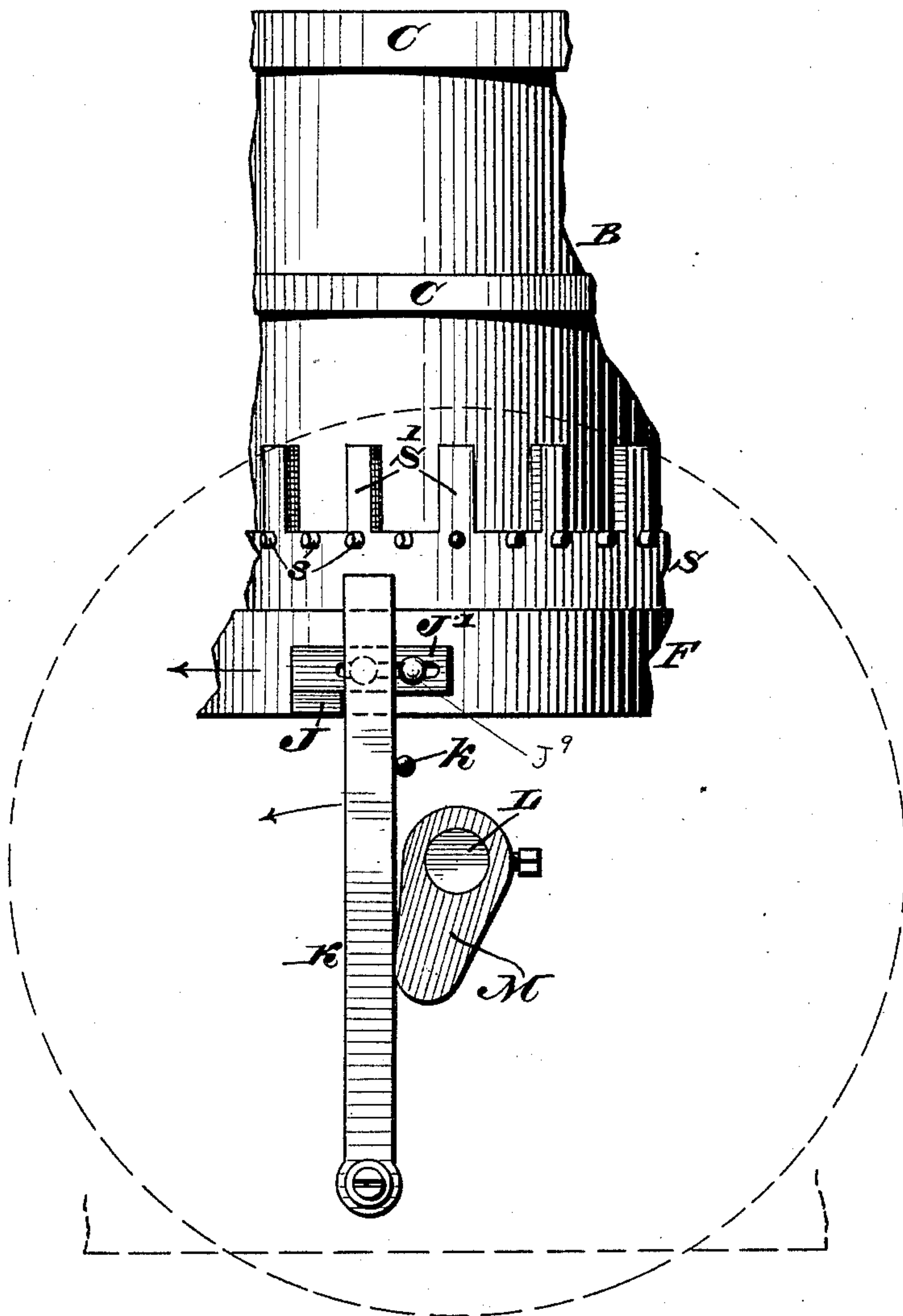
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fig. 3.



WITNESSES:

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INVENTOR:

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UNITED STATES PATENT OFFICE.

HERMAN MEIER, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO THE
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AUTOMATIC TAKE-UP FOR KNITTING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 433,251, dated July 29, 1890.

Application filed June 15, 1889. Serial No. 314,453. (No model.)

To all whom it may concern:

Be it known that I, HERMAN MEIER, a citizen of Switzerland, having resided in the United States one year last past, and declared my intention of becoming a citizen thereof, residing in the city and county of Philadelphia, State of Pennsylvania, have invented a new and useful Improvement in Automatic Take-Ups for Knitting-Machines, which improvement is fully set forth in the following specification and accompanying drawings.

My invention relates to an attachment for knitting-machines adapted automatically to draw the knitted fabric when completed away from the needles.

The invention consists in the provision of vertically-reciprocating hooks or catches arranged in series alternately to rise and fall by automatic means of simple and effective construction and operation.

Figure 1 represents a partial elevation and section of the needle-cylinder and attachments of a knitting-machine embodying my improved construction. Fig. 2 represents a similar view with the parts in a different position. Fig. 3 represents a side elevation of a part of the cylinder and the operating mechanism. Fig. 4 represents a detail view of the latch in sectional elevation.

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

Referring to the drawings, A designates the needle-cylinder, which may be of any well-known form of construction, and is provided with a gang of needles arranged therein in the ordinary manner. An internal cylinder B is secured in the lower part of said needle-cylinder and depends from the bottom thereof. The upper part of the latter cylinder is constructed with two flanges C, one arranged at the top and the other below to provide a recess. The said flanges have aligned apertures c formed therein for the reception of the shanks D' of metal hooks or catches D. Springs E surround the shanks of said hooks between the flanges C. These springs bear against the top flange at their upper ends, and are limited at their lower ends by pins e, passing transversely through the shanks of the hooks. The said springs keep the shanks

of the hooks normally depressed below the lower flange C, and are all held thereby at a uniform distance below the said flange.

A ring F is mounted on the lower end of the inner cylinder B, and is held in connection therewith by a headed stud G. The ring is provided with a camway H, consisting of a gradual rise or incline running into a horizontal wall, which terminates in a vertical wall or shoulder. The stud G is located in such manner as to form a stationary projection to coact with the camway H. When the horizontal wall of said camway rests on the stud, the ring F is down in its normal position and the lower edge thereof flush with the lower edge of the cylinder B. An arm J is secured to the ring F at a right angle to the lower edge thereof and provided with a top vertical extension J', with an elongated slot therein, through which clamp-screws J⁹ pass to provide an adjustable connection for the same. A lever K is pivoted to a part of the frame-work and projects upward to bear against the arm J. This lever is long enough to cause a continual engagement thereof with the said arm J, and limited in its backward movement by a stud k.

A cam M is mounted on the shaft L, and is adapted to engage the lever K and impel it in the direction of the arrow, as shown in Fig. 3. A series of obliquely-arranged springs N are secured at their lower ends to the ring F and at their upper ends to the lower flange C of the cylinder B. These springs have attaching-blocks, which elevate the same and prevent contact thereof with the parts over which they extend. The stud G also forms the pivotal connection for a gravity-latch P, having a lower weighted end R, provided with a pin r, moving in a slot b in the lower end of the cylinder B. The latch P is formed with the weighted end R to insure at all times a return of said latch to a vertical position, and the slot b and pin r are adapted to the movement of said latch. The upper end of this latch is bifurcated to form a vertical arm p, provided with a top bevel m, and an oblique arm p', the upper end of which is bent inward at an angle and forms a bearing-surface for a purpose hereinafter set forth. Above the ring F a ring S is located, and is con-

constructed with a series of upwardly-projecting fingers S', arranged at equal distances apart and of a regular length, and upon which rest a part of the depending ends of the shanks D'. A line of studs s are arranged at the centers of the bases of the fingers and at the centers of the spaces between the same. These studs exactly correspond in number to the number of hooks employed.

The cam-arm M as it is revolved by the shaft L engages the lever K and forces it forward. The lever bearing against the arm J impels it and turns the ring F, which rises as the inclined wall of the camway thereof rides over the stud G. As the ring F rises, it also gradually elevates the ring S. One-half of the shanks D' of the hooks D normally rest on the fingers S' of said ring S, and the remaining shanks depend centrally over the spaces intersecting said fingers. In view of this arrangement, when the ring S rises, the fingers S' thereof force the shanks of part of the hooks upward, while the remaining non-engaged shanks rest stationary. As the ring S rises, one of the studs s strikes under the bent end of the arm p' of the latch P and tilts the latter back until the upper beveled end of the arm p lies in the vertical path of descent of the next adjacent stud s. At this time the cam-arm M will have become disengaged from the lever K and the ring F returned to its normal position by the springs N. The obliquity of the springs N causes the line of draft thereof to be at an angle to a horizontal plane, and when the ring F is revolved by the arm K it is moved against the resistance of the said springs, which will then be drawn laterally at a greater angle than when in their normal position, and at the moment when the ring F is released from the arm K the said springs return to their normal position and draw the said ring around therewith. It will be understood that the said springs will have an inherent retractile tension of sufficient power to overcome any resistance offered thereto by the ring, and that the said ring will move freely on the cylinder B. When the ring F revolves backward, it descends gradually through the medium of the camway H thereof riding over the stud G. The springs N have no function whatever in raising the ring F, the latter movement of the ring being accomplished through the camway H, the stud G, arm J, and lever K, as stated, the said springs acting to resist a revolution of said ring F and bring the same into its normal position, as shown in Fig. 2. It is for this purpose that the said springs are arranged obliquely. The lever K is thrown back against its stud k, and the ring S descends with the said ring F until the upper ends of the fingers S' are slightly below the lower ends of the depending shanks D' of the hooks D. As the ring S is lowered, the stud s above the beveled end of the arm p of the latch P rides downward over the said arm, thereby turning the ring S around to allow

the fingers S' to become disengaged from the ends of one set of shanks D' and engage the next successive shanks.

The ring S is constructed with one-half the number of fingers as there are hooks D. By this means one half of the said hooks are raised to engage the knitted fabric, while the other half remain stationary until in like manner successively operated. The hooks are lowered by the retractile action of the springs E, and caused to contact either with the upper ends of the fingers S' or to depend over the space between said fingers.

In addition to the propelling function of the lever K, it bears against the stud k, and thereby also acts in the capacity of a guard to prevent the ring F from returning backward beyond a certain point.

In addition to the hooks, a weight will be attached to the fabric, but no adjustment thereof is required after being once connected, as the said hooks will continuously clear the fabric from the needles.

The operation described is that employed in continuous circular knitting in the formation of the stocking-leg.

When the heel is constructed, one-half of the needles are thrown out of operation by well-known means, and a part of the hooks are actuated alternately on one side and remain idle on the other. When the needles are raised on one side of the machine, they form no stitches, and therefore do not increase the length of the fabric nor feed the same down. Consequently said portion of the machine is idle, and the hooks D, which have been operated to take hold of the fabric on the idle side of the machine, are held elevated by engaging the said fabric, and are thereby thrown out of action as their shanks D' are raised above the fingers S' of the ring S.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a knitting-machine, the combination of spring-actuated hooks having depending shanks, a revoluble ring having a camway therein, a stud to engage said camway, a latch, and means to reciprocate said ring, with an upper ring having fingers to engage said hooks and studs to engage said latch, substantially as described.

2. In a knitting-machine, the combination of a series of spring-actuated hooks having depending shanks, a lower ring having a camway, a stud to engage said camway, a cam-actuated lever, and springs for operating said ring, a gravitating latch and an upper ring having projecting fingers to engage said hooks and studs to engage said latch, substantially as described.

3. In a knitting-machine, a series of spring-actuated hooks with extended depending shanks, a ring engaging said shanks and having vertical fingers with spaces between the same, and studs at a right angle thereto, a ring, substantially as described, for automati-

cally operating the ring engaging said shanks, so as to cause an alternate rise and fall of the said hooks, a gravitating latch, and means for elevating and depressing the lower ring, said parts being combined substantially as described.

4. In a knitting-machine, the combination of the needle and internal cylinders, a series of spring-actuated hooks provided with depending shanks, a ring having studs and provided with fingers adapted to engage each alternate shank of said hooks, a gravitating latch for engaging said studs, a spring-actuated ring below said former ring provided with a camway operating over a stud, an arm projecting from said latter ring, and a lever and cam for driving the said lever, substantially as described.

5. In a knitting-machine, the combination of a needle-cylinder and an inner cylinder, the latter having flanges with apertures, hooks or catches in said apertures having depending shanks, a ring revoluble on the lower end of the inner cylinder and provided with a camway, a stud to engage said camway, means to reciprocate said ring, a latch, and a ring above said lower ring provided with fingers and studs, for the purpose set forth.

6. In a knitting-machine, the combination of the needle-cylinder, the internal cylinder projecting below the said needle-cylinder and provided with flanges having aligned openings, a series of hooks provided with depending shanks mounted in said flanges of the internal cylinder and having transverse pins therein to bear against the lower flange, springs on said shanks between the two flanges, automatic devices consisting of springs and rings moved by a cam-actuated lever for operating the hooks, one of the said rings being formed with fingers separated by spaces and with studs, and the other having a camway, a gravitating latch, and the said cam-actuated lever for operating the lower ring, substantially as described.

7. In a knitting-machine, the combination of the needle and internal cylinders, a series of spring-actuated hooks provided with depending shanks, a ring having a series of vertical fingers and horizontal studs, an automatically-operating latch coacting with said

studs to turn said ring, a ring below said former ring adapted to automatically rise and fall, and devices for operating the latter ring, substantially as described.

8. In a knitting-machine, the combination of a needle and internal cylinders, a series of spring-actuated hooks or catches, an upper ring having fingers and studs, an automatically-operating latch provided with two arms, a lower ring having a camway adapted to ride over a stud to raise and lower the same, and a projecting arm, springs secured to said lower ring and to one of the cylinders, a lever bearing against the projecting arm of said lower ring and normally resting against a stud, and a cam or eccentric arm on the main shaft operating said lever, substantially as described.

9. In a knitting-machine, the combination of a needle-cylinder and an internal cylinder, hooks or catches having shanks, studs to confine, and springs surrounding said shanks, the rings, a latch provided with two arms and a lower weighted end having a pin engaging a slot, springs N, and a cam-actuated lever for moving said rings to operate the hooks, substantially as described.

10. In a knitting-machine, the combination of the needle and internal cylinders, the spring-actuated hooks or catches, the rings below said hooks or catches, an automatic latch, an arm adjustably secured to the lower ring, the springs N, the cam M, and the lever in engagement with the arm, substantially as described.

11. In a knitting-machine, the combination of the needle and internal cylinders, the series of hooks or catches having an automatic alternate rise and fall, the rings below said hooks, the lower one of which has a camway cut therein, a stud projecting out from the cylinder with which said camway coacts, the springs attached to the said lower ring and to one of the cylinders, and a cam-actuated lever for operating the lower ring, substantially as described.

HERMAN MEIER.

Witnesses:

JOHN A. WIEDERSHEIM,
L. JENNINGS.