

(Model.)

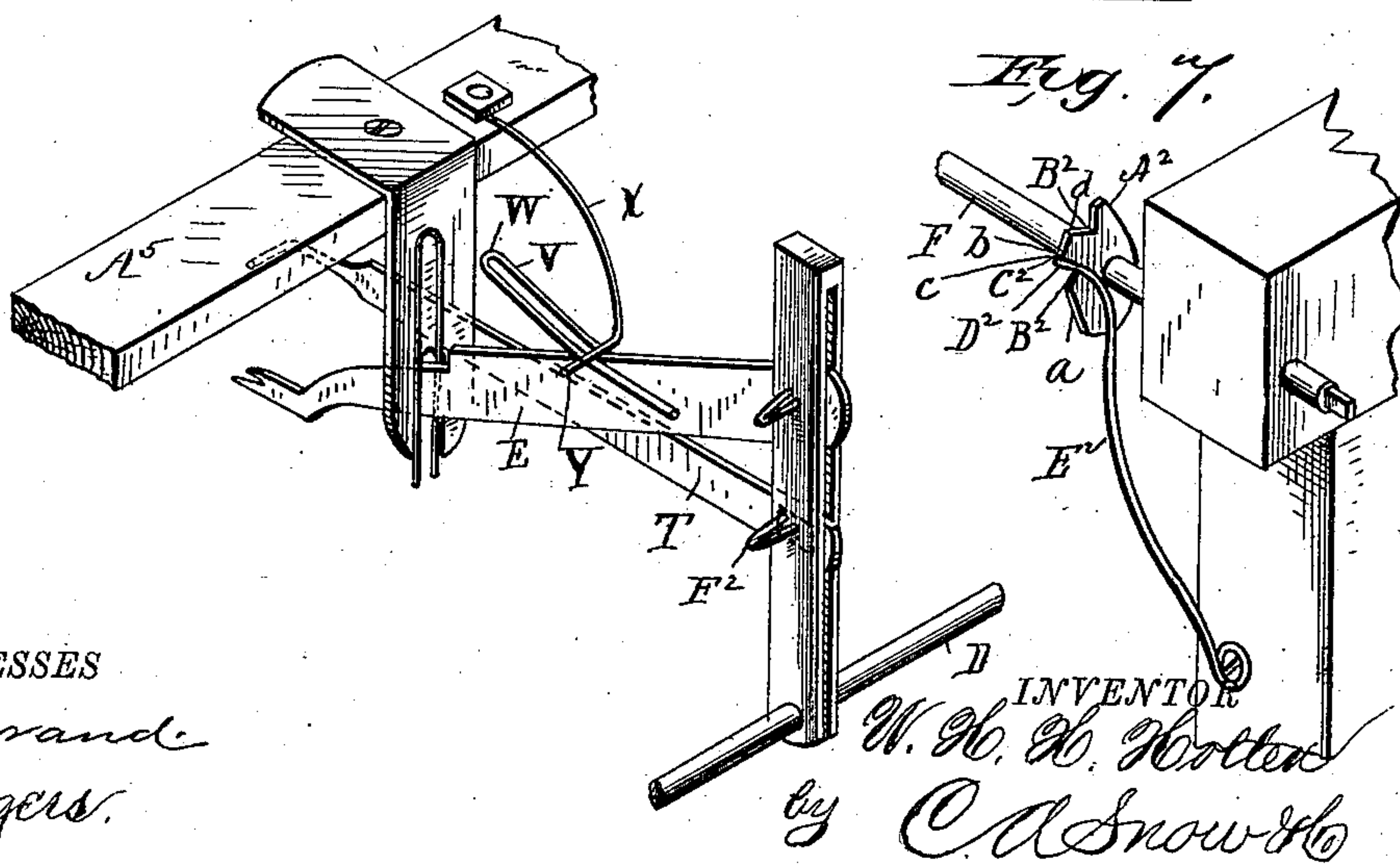
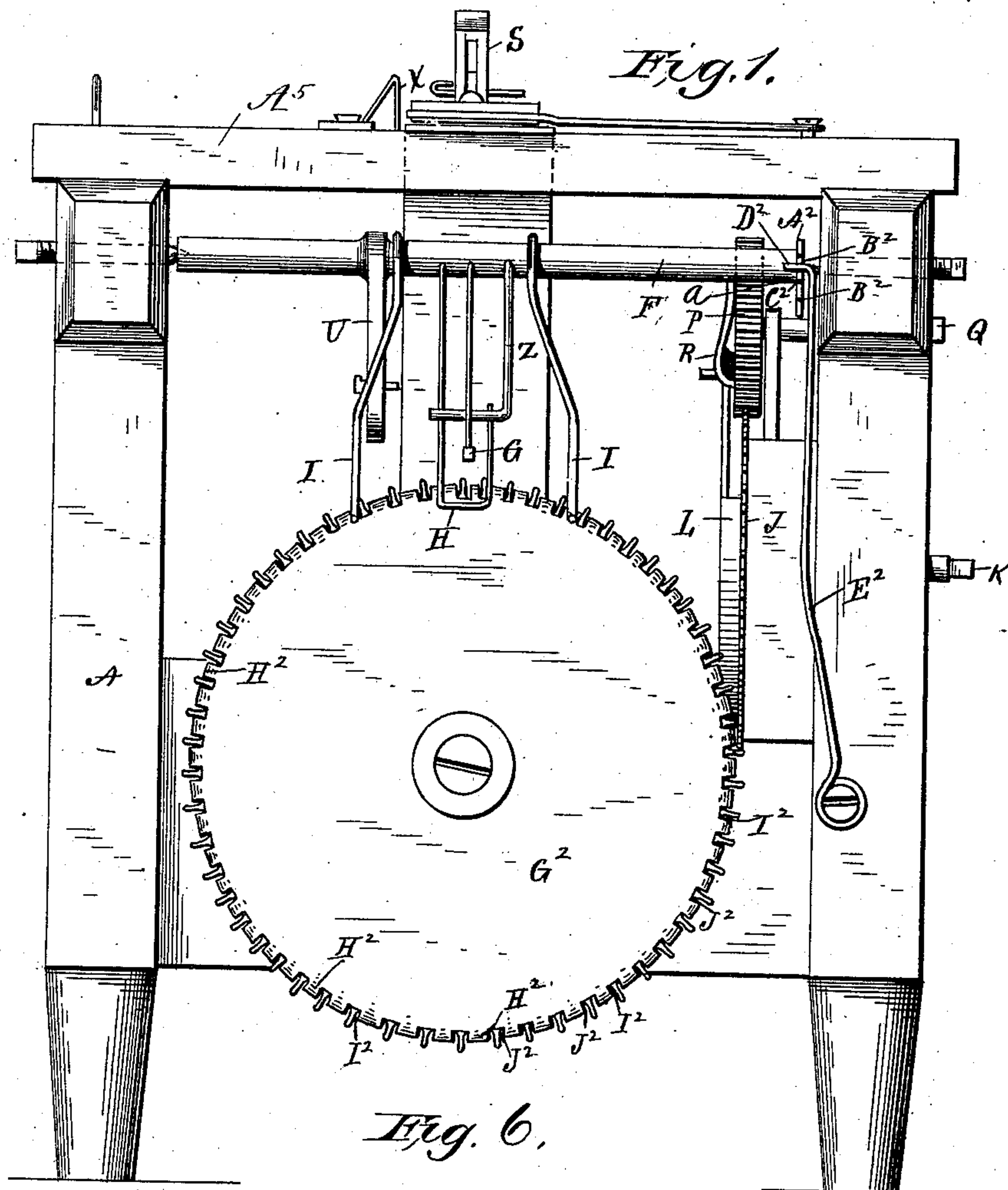
W. H. H. HOLLEN.

3 Sheets—Sheet 1.

KNITTING MACHINE.

No. 294,784.

Patented Mar. 11, 1884.



WITNESSES
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(Model.)

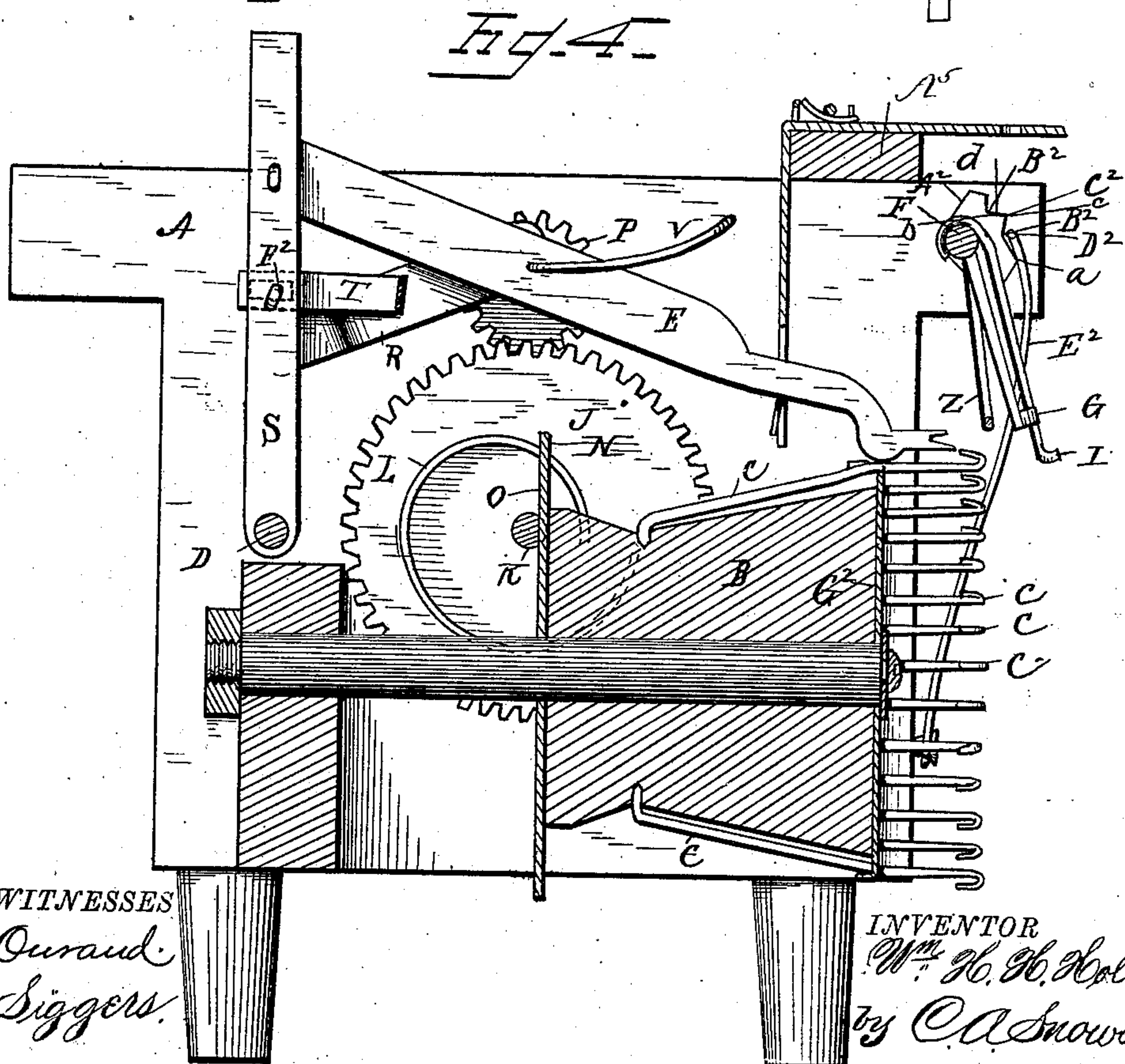
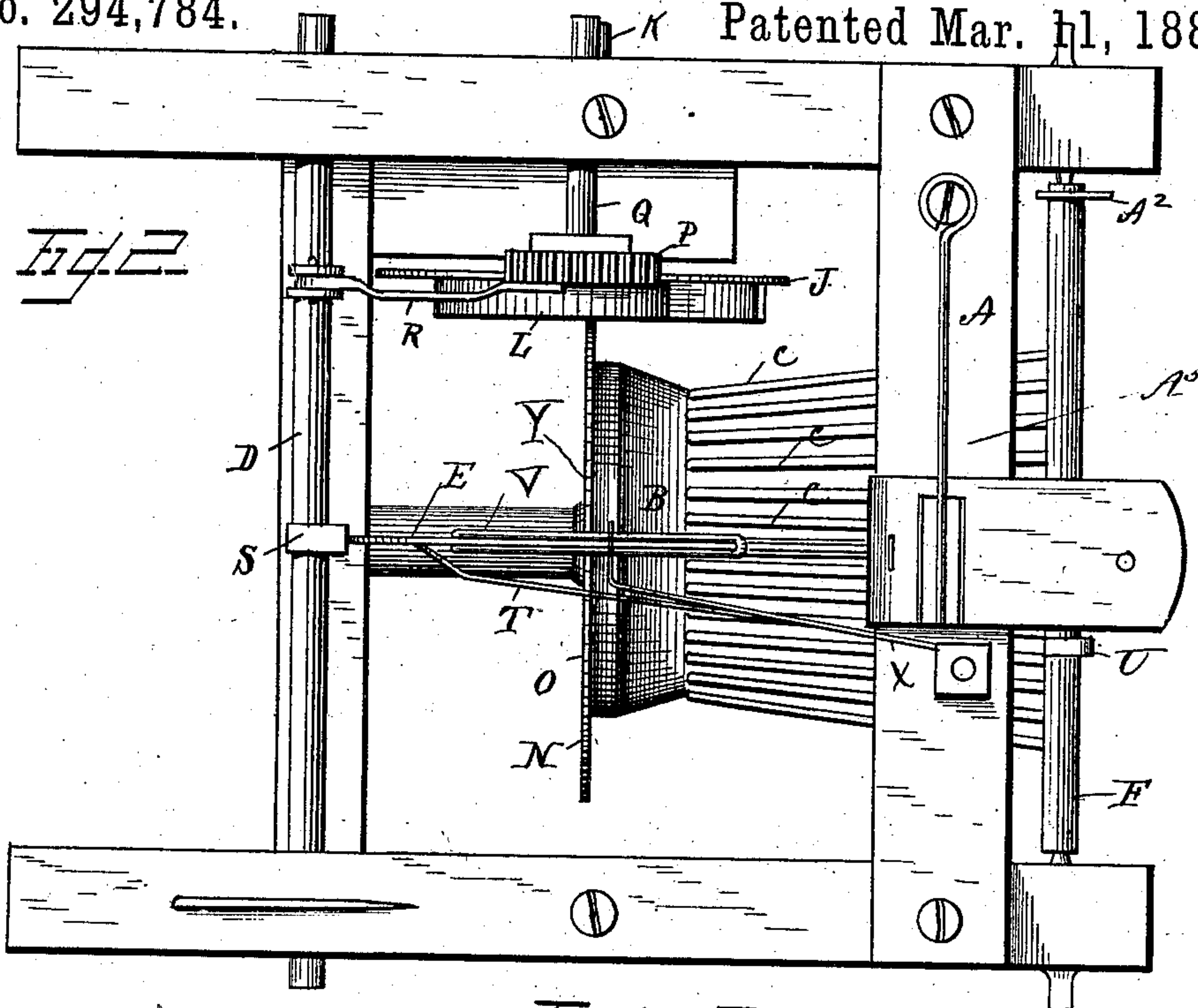
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W. H. H. HOLLEN.

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(Model.)

3 Sheets—Sheet 3.

W. H. H. HOLLEN.
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Fig. 3.

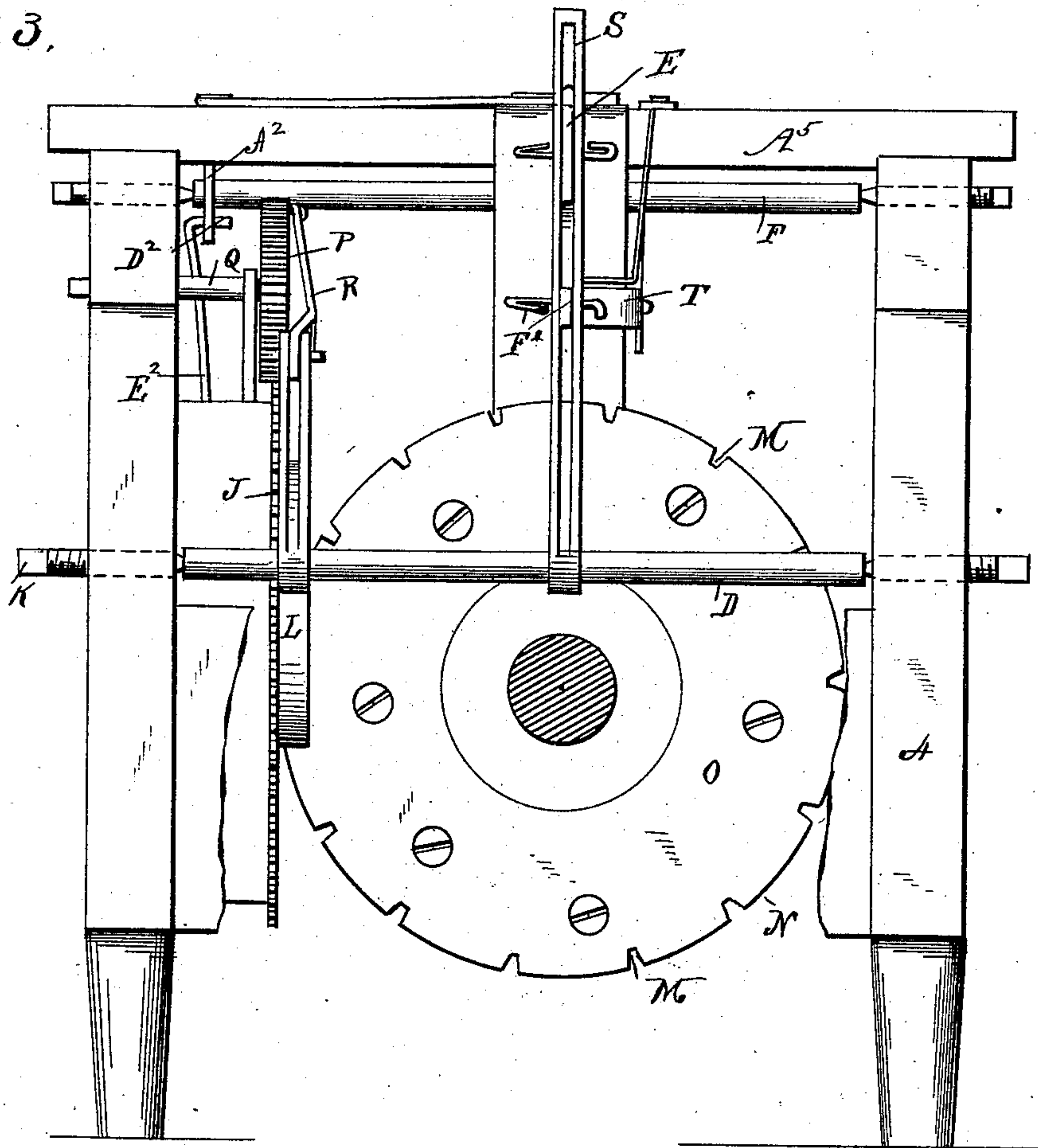
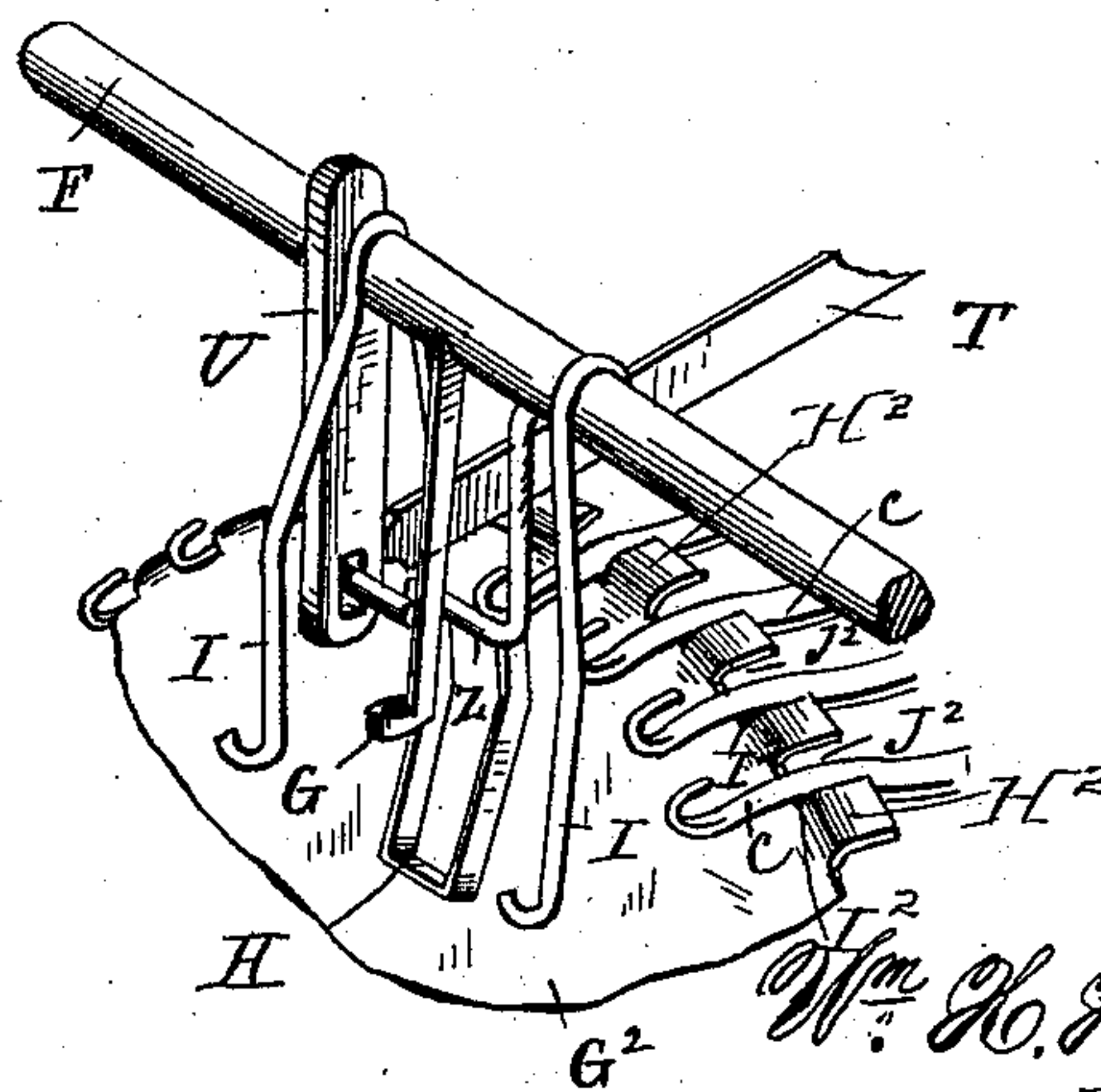


Fig. 5.



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UNITED STATES PATENT OFFICE.

WILLIAM H. H. HOLLEN, OF TYRONE, PENNSYLVANIA, ASSIGNOR, BY MESNE ASSIGNMENTS, TO ROBERT S. SEEDS, OF SAME PLACE.

KNITTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 294,784, dated March 11, 1884.

Application filed September 14, 1883. (Model.)

To all whom it may concern:

Be it known that I, WILLIAM H. H. HOLLEN, a citizen of the United States, residing at Tyrone, in the county of Blair and State of Pennsylvania; have invented a new and useful Knitting-Machine, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to knitting-machines of that class in which a circular needle-carrier is employed; and its object is to provide a machine possessing superior advantages in point of simplicity, inexpensiveness, durability, accuracy in operation, and general efficiency.

To this end the invention consists in certain improvements on the knitting-machine embodied in my Patent No. 72,296, December 17, 1867, substantially as will be hereinafter more fully described.

In the drawings, Figure 1 is a front elevation of my improved knitting-machine. Fig. 2 is a top view of the same. Fig. 3 is a rear elevation, parts being broken away to better show the construction. Fig. 4 is a vertical longitudinal sectional view of the machine. Fig. 5 is a detail perspective view of the rock-shaft, a segment of the needle-carrier, and the adjacent mechanism. Fig. 6 is a detail perspective view of the stitch-lifter, its keeper-spring, and the adjacent mechanism. Fig. 7 is a detail perspective view of the rock-shaft lock and the parts to which it is connected.

Referring to the drawings, A designates the frame of the machine, which embodies a front cross-beam, A⁵, and in which frame is journaled the circular needle-carrier B, having the needles C projecting laterally from its periphery, an operating rock-shaft, D, the stitch-lifter E, connected through intervening means with said rock-shaft, a front rock-shaft, F, the thread-carrier G, connected with shaft F, the stitch-presser H, carried by shaft F, and the fabric-pressers I I, also depending from shaft F, these parts being arranged substantially as shown in the above-mentioned patent.

J is a main operating gear-wheel, to the shaft K of which the motive power is adapted to be applied. The inner face of this gear-wheel is provided with a laterally-projecting

flange, L, arranged in a curved or coiled form, so that it will provide a cam that engages notches M in the projecting edge N of a plate or disk, O, secured to the rear end of the needle-carrier B. These notches M number one to every three needles, and the cam-flange L steps from one notch to the next during the rotation of wheel J to rotate the needle-carrier. A pinion, P, on a shaft, Q, engages the gear-wheel J, and is connected to the operating rock-shaft D by a pitman, R, and by this means said shaft is operated.

To the main arm S of shaft D is pivotally connected the stitch-lifter E, and to the said arm S is also pivotally connected a pitman, T, that is pivoted to a lateral arm, U, on the rock-shaft F, to communicate motion from shaft D to shaft F. The stitch-lifter E is provided with a forwardly-projecting arm, V, that is preferably formed of bent wire, and has its front end curved upwardly, as shown at W, to give a downward bow to the said arm. A spring, X, projects rearwardly from the cross-beam A⁵ on the front of the frame, and has its free end Y bent out to engage the top edge of arm V, and as the latter is moved alternately back and forth with the stitch-lifter, and the spring retains its position, the engaging end of the spring will be at the lowest point of the arm when the stitch-lifter is forward and on the upward movement, and will be at the highest point when the stitch-lifter should be pressed down to engage the thread. Thus the tension of the spring is automatically regulated to be less when the stitch-lifter is to move upward, and greatest when the said lifter should be pressed downward.

The stitch-presser H is hook-shaped, and has but one end secured to the rock-shaft F, while its loop or U-shaped portion embraces or straddles the projecting needles, as heretofore. By having only one end secured the presser has a lateral elastic motion, so that it will not bear too hard upon or strain the needle as it moves along the same during the rotation of the needle-carrier. A right-angular guard wire or arm, Z, projects across the free end of the presser H, as shown.

A lock is provided at one end of the rock-shaft F, for the purpose of holding the presser H back while the stitch-lifter is catching the stitch, and for retaining the same forward

while the stitch-lifter is moving back. This lock consists of a cam-plate or segment, A^2 , that is arranged on the rock-shaft, and has its edge provided with two notches, B^2 B^2 , that form a central projection, C^2 , with beveled side edges. These notches are engaged by the end D^2 of a spring-arm, E^2 , that projects from the frame A , as shown. This arm E^2 is preferably pivoted, so that it can be thrown over out of engagement with the cam when desired.

The operation of this lock is as follows: When the stitch-lifter E and the presser H and arms of the rock-shaft are at the limit of their forward stroke, the end D^2 is at the end of the bevel a of the lower notch, B^2 . The end D^2 will permit the passage of the bevel a , so as to admit of the rock-shaft returning far enough back to loosen the tension of the thread, when the abrupt bevel b of the under edge of the projection C^2 encounters end D^2 , and the rock-shaft is held by the friction of this abrupt bevel until the point c of projection C^2 is passed. Then the rock-shaft moves quickly back as the incline or bevel d of the top edge of the projection C^2 passes under the end D^2 . On the return movement the bevel d acts against the end D^2 , and the friction retains the rock-shaft until the stitch-lifter has caught the stitch, when the point c passes end D^2 and the bevels b and a pass easily under arm D^2 as the rock-shaft moves quickly and freely backward. To enable this locking of rock-shaft F without affecting shaft D , the pivotal bearing F^2 of pitman T with arm S is elongated, as shown. This elongated pivotal bearing F^2 is preferably formed by simply extending the bearing-perforation in the form of a slot, as shown in dotted lines, Figs. 4 and 6, so that the slot D , its arm S , and the stitch-lifter E can move the full limit of the slot in either direction before the pitman T and the rock-shaft F are operated. If it were not for the spring-friction locking mechanism acting on shaft F , the friction at the pivotal bearing F^2 between the arm S and pitman T might cause a movement of the said pitman and shaft F ; but the said locking mechanism securely retains the shaft F and pitman T locked, while the other parts connected with shaft D move positively until the arm S moves the full limit of the slot, when the said arm will operate the pitman and cause the movement of shaft F against the action of the locking mechanism.

The front plate, G^2 , of the needle-carrier is formed of thin metal, so that the portions H^2 between the notches I^2 , formed for the passage of the needles, may be bent back horizontally to form guide-grooves J^2 , that receive the end of the stitch-lifter as it falls on the backward stroke. By this arrangement the lifter is guided onto the needle and its action is rendered accurate and positive. As the gear-wheel J is revolved its spiral L engages with plate O , and thus rotates the needle-carrier, while the pinion P operates the pitmen R , which thus gives motion to the rock-shaft D , and consequently to the arm S and the stitch-lifter E . The stitch-

lifter being kept down in the grooves of the needles by the spring X during its forward motion, its point slides along up the groove of a needle, and then forward and under the stitch thereof, taking it up when its rear portion or heel strikes and slips up and along the groove, and thus raising the point end of the stitch-lifter E , so that it will carry the stitch over the end of the needle, when the upper projection at said point presses the stitch down under the end of the needle, and leaves it to be immediately pressed back against the front end of the needle-carrier B by the stitch-presser. In the meantime the thread-carrier comes forward and passes the thread across the needle, then glancing against one side of the hook and returning in the same space, or between the same two needles, but glancing against the side of the other or advancing needle, the needle-carrier being also at the same time moved forward by means of the mechanism above set forth.

I claim as my invention—

1. The rock-shaft having the approximately hook-shaped spring stitch-pressing loop secured by but one end to the shaft, means for operating this shaft, and the right-angular guard wire or arm projecting across the free end of the presser, substantially as set forth.
2. The combination of the main rock-shaft having the projecting arm, means for operating the rock-shaft, the reciprocating stitch-lifter pivoted to said arm, the pitman having the elongated bearing-slot, and pivotally connected to the arm, the auxiliary rock-shaft provided with the cam-plate formed with the double-beveled notch in its edge, and carrying the stitch-presser, fabric-pressers, and thread-carrier, the needle-carrier having the projecting needles, means for operating the needle-carrier, and a fixed spring having a bent end engaging the notches to hold the rock-shaft stationary while the main rock-shaft and its arm and stitch-lifter move the limit of the elongated pivotal bearing-slot of the pitman, substantially as set forth.

3. The combination of the frame, the needle-carrier having the projecting needles, and the rear plate or disk formed with a notched periphery, the main gear-wheel having the lateral-curved flange engaging the notches, the pinion meshing with this gear, the main rock-shaft having the two arms, the pitmen extending, respectively, from the two arms of this rock-shaft to the pinion and to an arm on the front rock-shaft, the front rock-shaft carrying the stitch and fabric pressers, and the stitch-lifter pivoted to the main arm on the main rock-shaft, substantially as and for the purpose set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of two witnesses.

WILLIAM H. H. HOLLEN.

Witnesses:

J. C. FOLLER,

J. M. CALDERWOOD.