

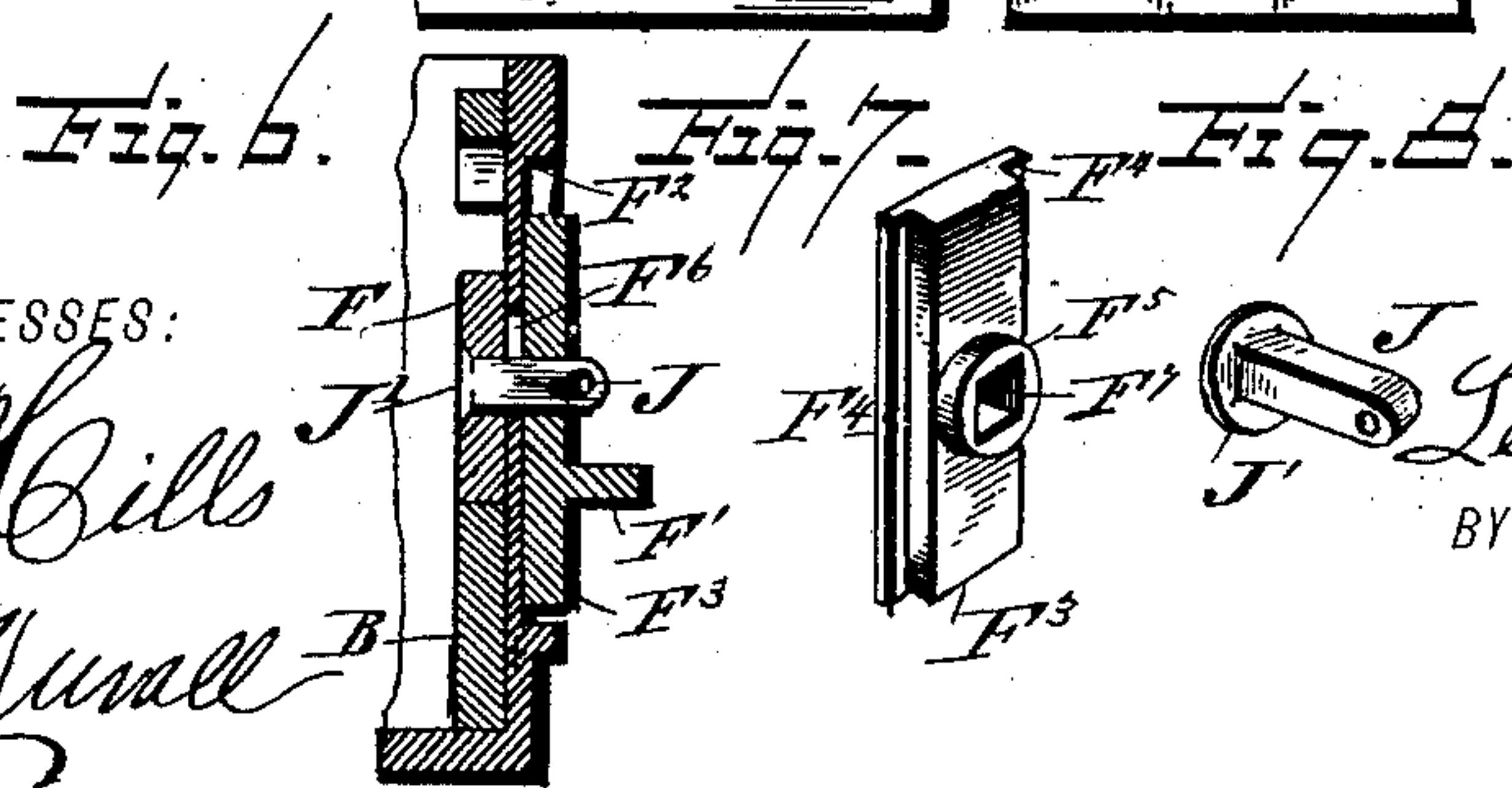
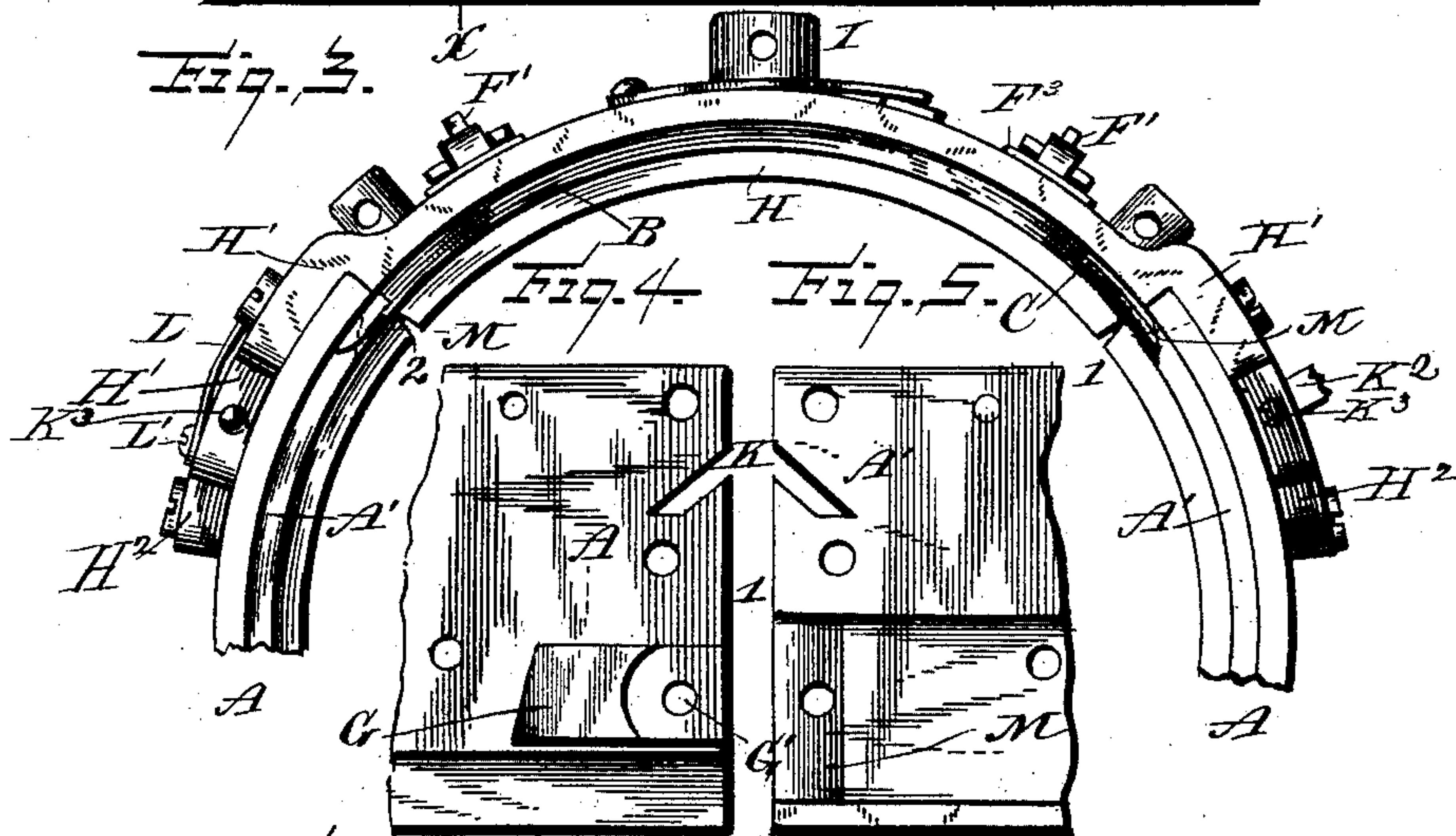
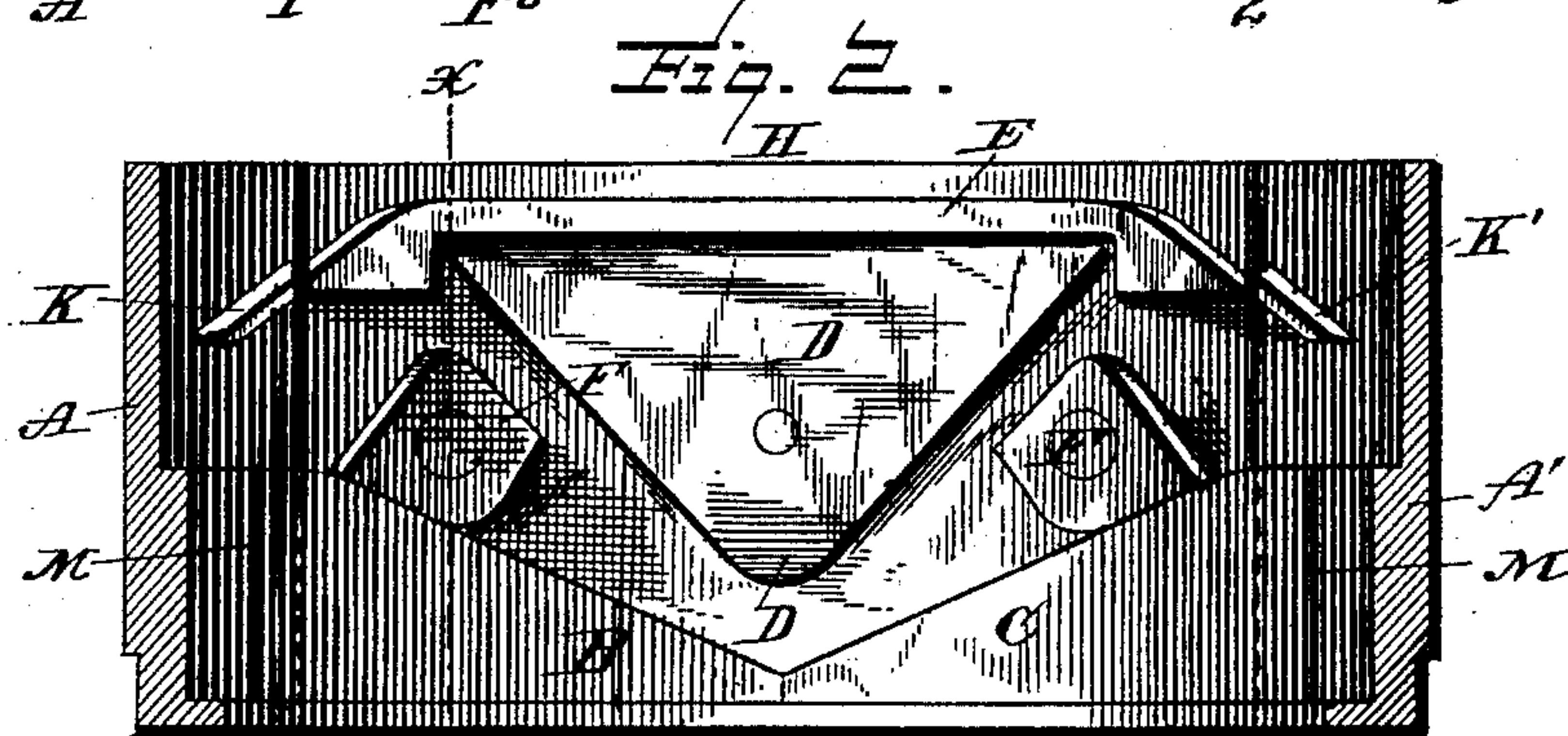
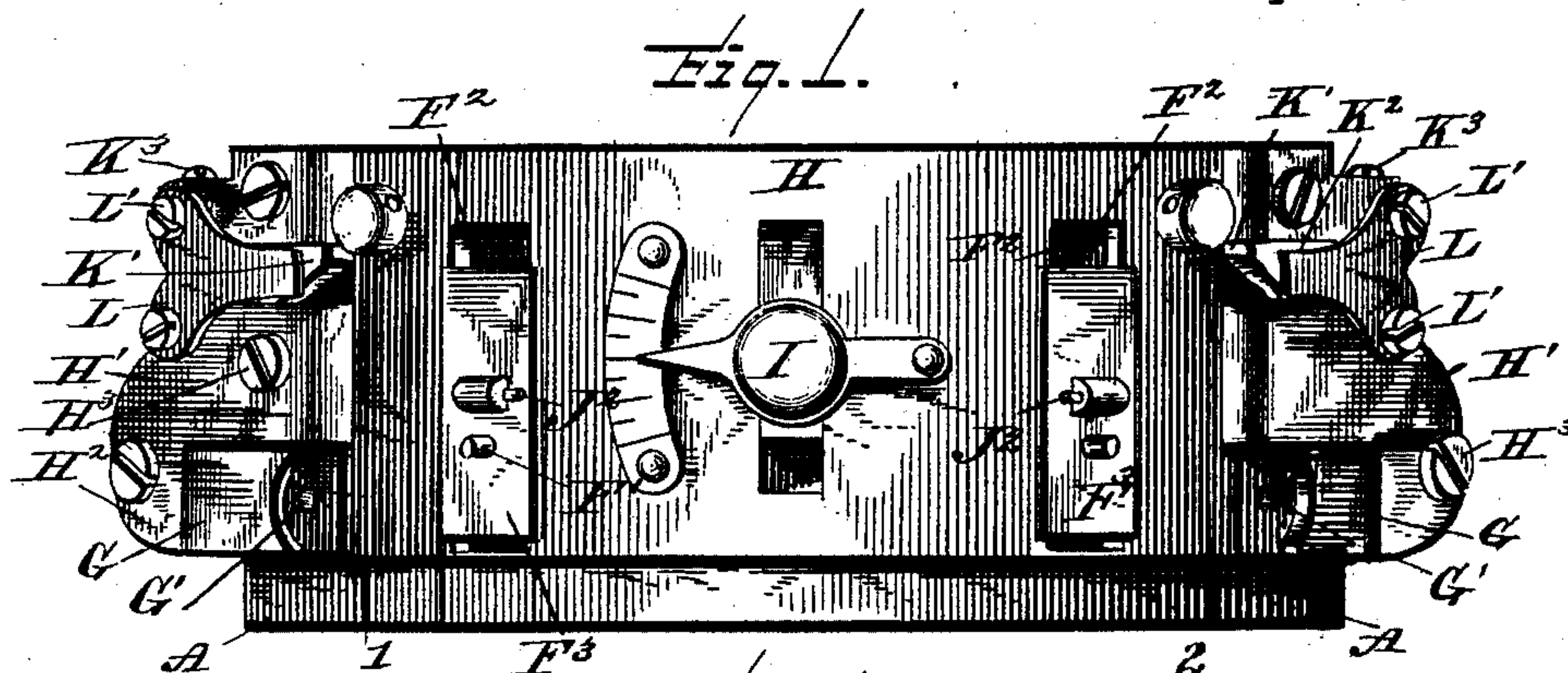
(No Model.)

L. F. GRAMMES.

CAM CYLINDER FOR KNITTING MACHINES.

No. 360,430.

Patented Apr. 5, 1887.



WITNESSES:

L. C. Mills
Wm. L. Small

INVENTOR

Lewis F. Grammes,
BY E. B. Stoetting
ATTORNEY

UNITED STATES PATENT OFFICE.

LEWIS F. GRAMMES, OF ALLENTOWN, PENNSYLVANIA, ASSIGNOR OF ONE-HALF TO C. J. P. BITTNER, OF SAME PLACE.

CAM-CYLINDER FOR KNITTING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 360,430, dated April 5, 1887.

Application filed January 19, 1886. Serial No. 189,085. (No model.)

To all whom it may concern:

Be it known that I, LEWIS F. GRAMMES, a citizen of the United States, residing at Allentown, in the county of Lehigh, State of Pennsylvania, have invented certain new and useful Improvements in Cam-Cylinders for Knitting-Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention has relation to certain improvements in cam-cylinders for knitting-machines; and the object of the invention is to overcome certain difficulties in the construction and use of that portion of the cylinder at which the needle-operating cams are located, it having been found by experience that the greatest strain to which the cylinder is subjected, and the greatest liability to breakage, as well as the greatest wear and impairment of the parts, invariably occurs in close proximity to the said needle-operating cams. Furthermore, the necessary recesses, slots, and openings required in the cylinder also occur where the needle-operating cams are located, so that in use cylinders are frequently worn out, and even broken, at the point mentioned, while the remainder of the cylinder is yet in good condition and capable of longer service.

By my improvements the cylinder is provided with a removable section constructed of steel, upon and to which removable section the needle-operating cams are arranged and connected, while the remaining portion of the cylinder is constructed, as usual, of cast-iron, so that the life of the entire cylinder is lengthened, as well as that of the cams arranged therein.

My improvements are also applicable not only in constructing new cylinders, but for the purpose of repairing worn, broken, and otherwise disabled cylinders, certain details of construction being such that the worn cams and the section of a complete cylinder on which they are mounted may be removed by sawing or otherwise from the entire cylinder, and an improved cam-section inserted in the place of the removed worn section, whereby the cylinder is rendered capable of further use.

Referring to the drawings, Figure 1 is a side elevation, Fig. 2 a central vertical sec-

tion, and Fig. 3 a partial plan view, of a cylinder constructed or provided with a removable section in accordance with my invention. Fig. 4 is an exterior elevation, and Fig. 5 an interior elevation, of that portion of a cylinder to which my improved removable section is intended to be applied. Figs. 6, 7, and 8 are details of construction hereinafter described, Fig. 6 being a section on the line *xx* of Fig. 2.

Like letters of reference indicate like parts in all the figures of the drawings.

A A represents that portion of an ordinary cylinder in which is constructed the plain portion of the needle-track A' thereof, the same being that portion of the cylinder which, by reason of its not being subjected to any unusual strain, usually outlasts the remaining portion of the cylinder in which are arranged the usual needle-operating cams, B C D E, and movable switches or latches F.

In applying my invention to a worn cylinder, I sever therefrom that portion carrying the needle-cams, by sawing the same vertically at or about the lines 1 2, these lines passing slightly in front of the usual projecting lugs, G. Of course it is understood that when my improvement is applied to a new cylinder these lugs are formed thereon.

H represents my removable section, and it is formed preferably of steel, either cast or forged, with projecting lugs H' at each end, which lugs are arranged substantially outside of the vertical plane of the section as a whole, in order that they may overlap and lie against the outer sides of the ends of the remaining portion of the cylinder. These lugs H' are each extended downwardly, as at H², to form a hook so located as to take over and lock against one of the lugs G, the vertical line of contact between the hooks H² and lugs G being slightly beveled, in order that when the removable section is forced down into line with the remainder of the cylinder the parts shall be drawn snugly together at their edges—that is to say, along the vertical lines 1 2. Suitable screws, H³, are passed through the lugs H' into the adjacent portions of the cylinder, to retain the section in position.

As thus far described, it being understood that the removable section, together with its fixed and movable cams and latches, is made

of steel, it is evident that a worn cylinder may be repaired in an expeditious manner, so as to be used for a time exceeding the service of a new cylinder when wholly composed of cast-iron, as usual, so that while I do not claim, broadly, the substitution of steel for cast-iron, yet I do consider the manner of combining my removable section with the remaining portion of a cylinder, whether the latter be new or old, as an important novel feature of my invention.

I represents the usual adjusting stud connected with the movable cam D and provided with an indicator and scale, whereby the position of the cam within the cylinder may be indicated upon its outer surface, and to these parts I lay no claim as being of my invention.

The gates F are in themselves old, and have, as herein shown, been constructed so as to be moved by means projecting through the cylinder and connected with devices outside of the same; but as heretofore constructed the slots F² in the cylinder-section H and the parts arranged therein for carrying the switches or gates have been so constructed as to form complete and direct openings through the cylinder, whereby in operation needles catch at the sides of the slots, causing the gates to loosen and eventually breaking the cylinder. During movements along, under, and over the cams great pressure is brought to bear by the needles upon the cams and the face of the cylinder, and obstructions coming in the way or course of the needles are sure to break either the needles, the cams, or the cylinder itself. In the old way, the slots being exposed, the needles bear upon the latch or gate and upon the sides of the slots, thus loosening the screws by which the latches or gates are fastened, and giving so much space at the sides of the slots that the needles catch and are bound to break something, as said before, either the needles themselves, the cams, or the whole cylinder.

I have embodied in my invention a construction which prevents these objectionable features in operation. The covering-block F³ projects into and fills the recess F², and is rabbeted or flanged, as at F⁴, to project over and rest against the outer surface of the cylinder-section. The recess F² does not extend completely through the cylinder, except at its central portion, which I have designated as the "slot F⁶," and the latch or gate is of sufficient length to extend over said slot F⁶, whatever its position may be in the recess F², so that no opening appears on the inside of the cylinder for the needles to catch into. (See Fig. 2.)

The hub or boss F⁵ is provided with a square or, it may be, a polygonal aperture, F⁷, through which a square pin, J, projects, the said pin being passed through a square aperture in the switch or gate F, which aperture is also countersunk to receive the flared head J' of the pin. The point of the said pin is apertured for the passage of a locking-pin, J², whereby the switch and the covering-block are secured in operative position to the cylinder. By this con-

struction the object above indicated—that is, the prevention of breakage of either the needles, cam, or cylinder—is accomplished.

I have also provided another improvement, which consists in the novel construction and arrangement of yielding points for the fixed cams E. When these are provided, I saw in the edges 1 2 diagonally-disposed slots K, in which I arrange the points K', their location being immediately in front of and in line with the fixed cam E, and their inclination being such as to coincide with the inclination of the ends of said cam. The points K' are formed on the ends of arms K², which, by means of pins or screws K³, are pivoted in the projections H', formed on the removable section. To the outer surface of each of said projections is secured a spring, L, by means of screws L', the free end of the spring bearing upon the free ends of the arms K², on which the points K' are formed. Now, it will be seen that the points are yieldingly held projected inwardly through the slots K and in front of the ends of the fixed cam E, so as to form a continuation of the inclination of said ends upon which the projections of the needles pass. Quite often in practice the projections of the needles in approaching the fixed cam E abut and bind against its points, and this, when continued, form false irregular tracks or creases, and often cause a breakage of the needles and needle-cylinder and causes undue wear of the cam, thus rendering a stoppage of the machine necessary. By employing my improved points the needles are directed upwardly toward and upon the inclines of the fixed cam E, and should they accidentally fail to strike the points, so as to ride upwardly thereon, or so as to become bound against their inner faces, they will, by reason of the points being yieldingly held by the spring L, cause said points to recede in the slot K, so as to permit the needles to reach the cam E.

In order to render the operation of the lugs H² and the connection of the removable section more exact and satisfactory, I may bevel inwardly the flanges of the cylinder which constitutes the track A', as clearly shown in Fig. 3, in which case the fixed portions B C of the track are similarly beveled and projected, as at M, across the lines 1 2. This construction does not prevent a ready insertion of the removable section by moving it vertically into position, the arms K² being swung out, as indicated on the right of Fig. 3, during the insertion of the section.

The various holes shown in Figs. 4 and 5 are for the passage of the screws employed to secure the fixed cams of the movable section when formed separate therefrom, though they may be formed integral therewith, if desired.

I do not claim, broadly, a removable cam-section for a knitting-machine cam-cylinder; nor do I claim, broadly, a knitting-machine cam-cylinder made in sections.

Having thus fully described my invention and its operation, what I claim is—

1. A knitting-machine cam-cylinder formed of sections, one of which comprises only the plain portions of the needle-tracks and lugs on the outer surface of the ends of said portion, 5 and the other of which is formed of a more serviceable material and provided with the needle-operating cams and with hooks to take over said lugs, substantially as specified.

2. A knitting-machine cam-cylinder comprising one portion having the plain needle-tracks and the other portion having the irregular needle-tracks and movable cams, and provided with hooks and projecting needle-track portions M, substantially as specified.

3. A cam-cylinder comprising a plain needle-track portion, and a removable section carrying the needle-cams and provided with hooks arranged to take over beveled projections G on the plain track portion of the cylinder and 20 to draw the same and the removable section firmly together, substantially as specified.

4. In a knitting-machine cam-cylinder, the combination of a plain needle-track portion terminating on substantially the lines 1 2, and 25 having projections G, with a cam-carrying section having hooks H² and screws or equivalent securing devices connecting the hooks with the cylinder, substantially as specified.

5. The combination of a switch or gate, F, the cylinder having a recess, F², and a central 30 slot, F⁶, a square pin, J, and a covering-block having a square aperture, F⁷, and a pin, J², substantially as specified.

6. In a knitting-machine cam-cylinder, the combination, with a removable section, H, having 35 the fixed cam E and projecting lugs H', of points K', projecting from arms K², pivotally mounted in said lugs, and of a plain track cylinder-section having slots K, substantially as specified. 40

7. In a knitting-machine cam-cylinder, the combination of a plain track-section and a removable cam-section provided with overlapping connecting devices having beveled joints, whereby the insertion of the removable cam- 45 section acts to draw the parts together, substantially as specified.

In testimony whereof I affix my signature in presence of two witnesses.

LEWIS F. GRAMMES.

Witnesses:

EDWARD H. RENINGER,
JACOB D. BURGER.