

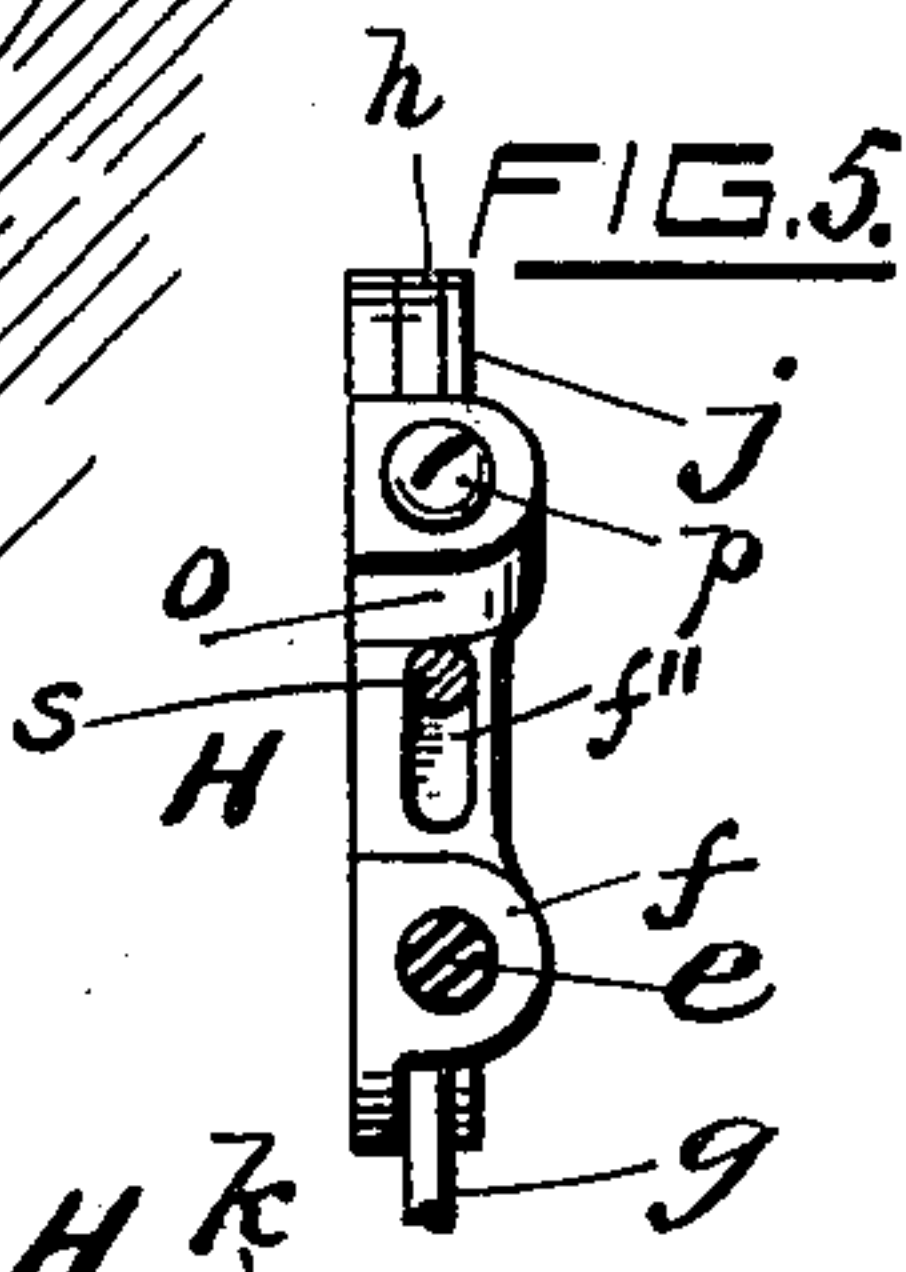
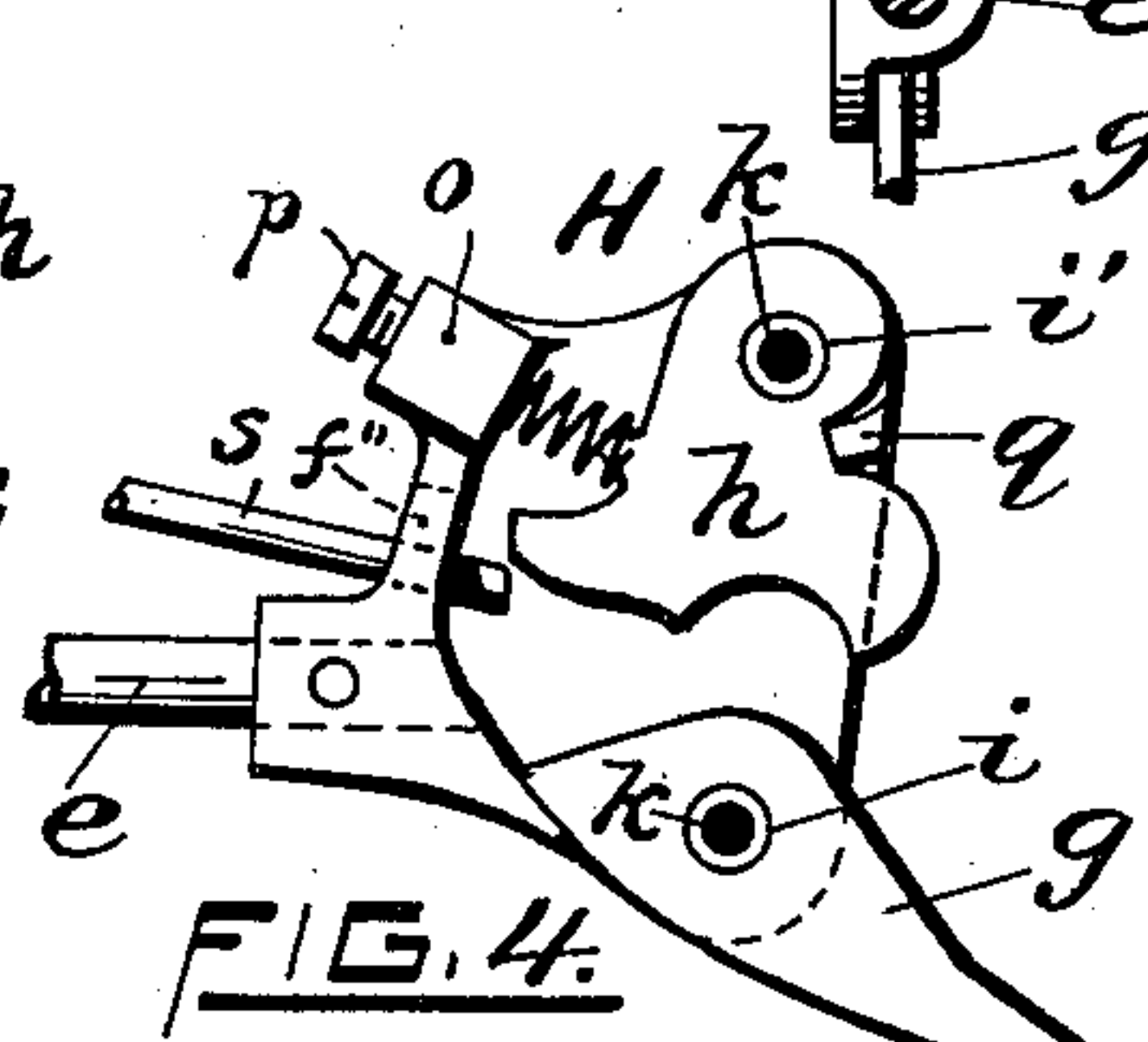
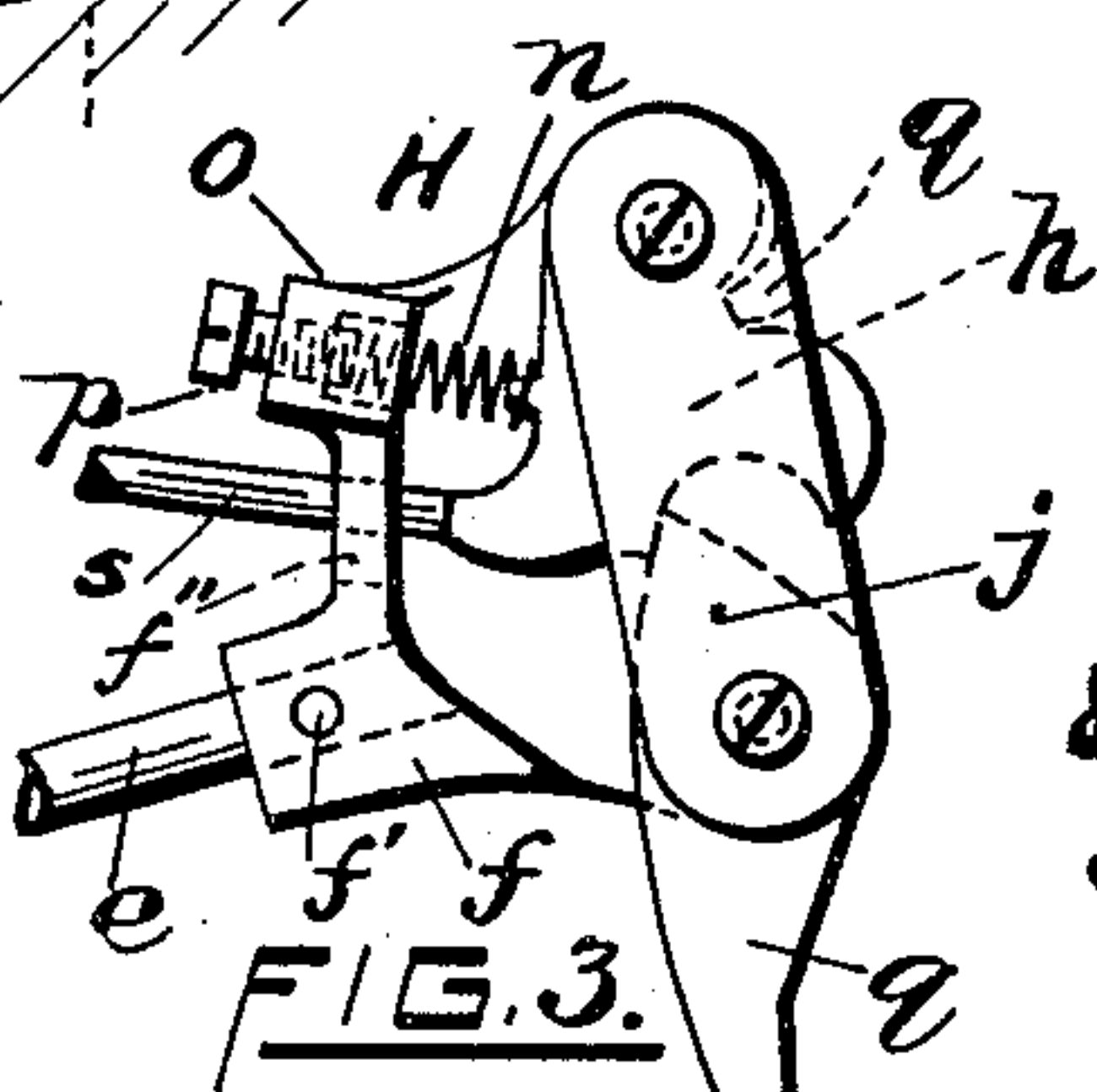
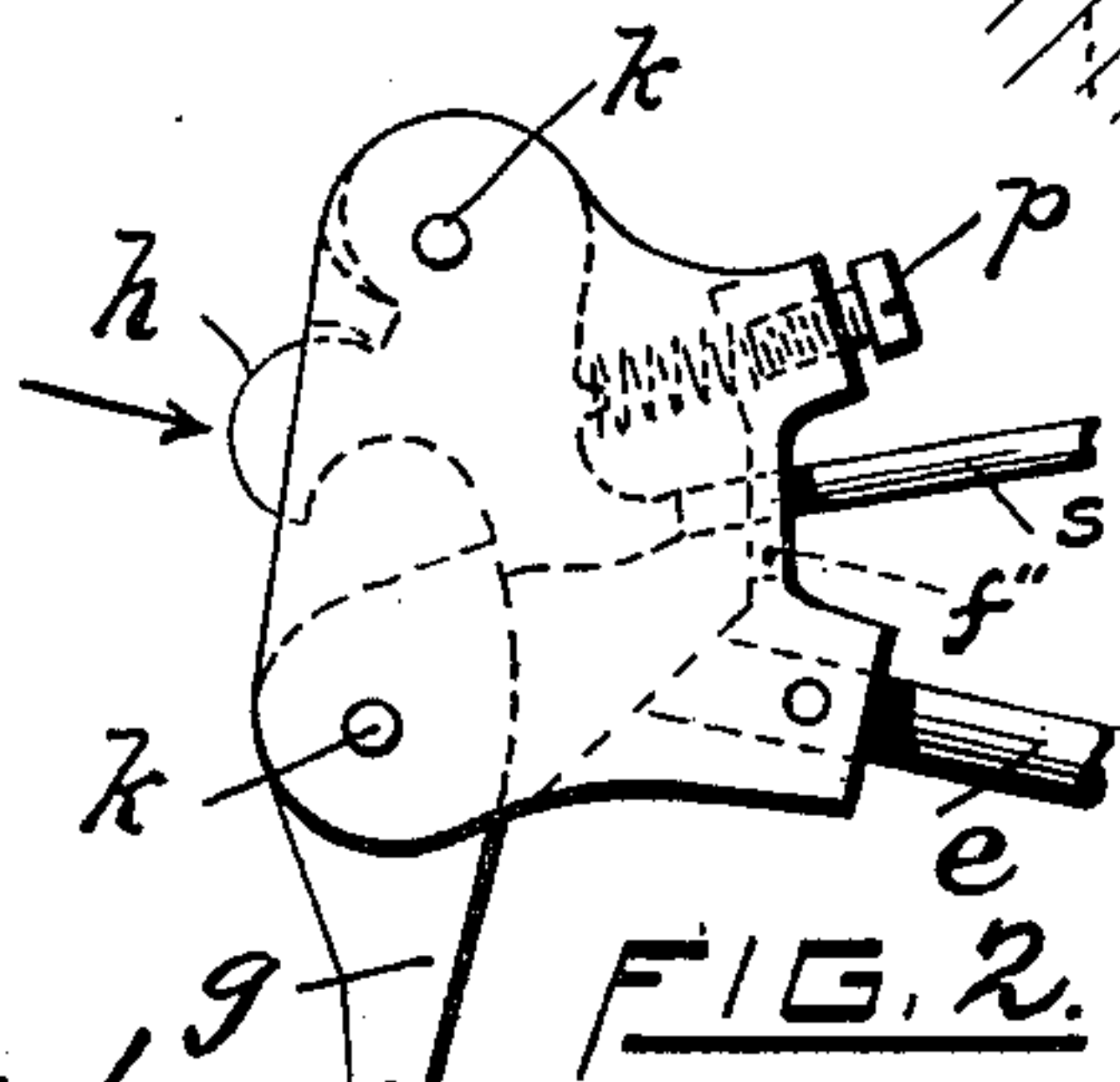
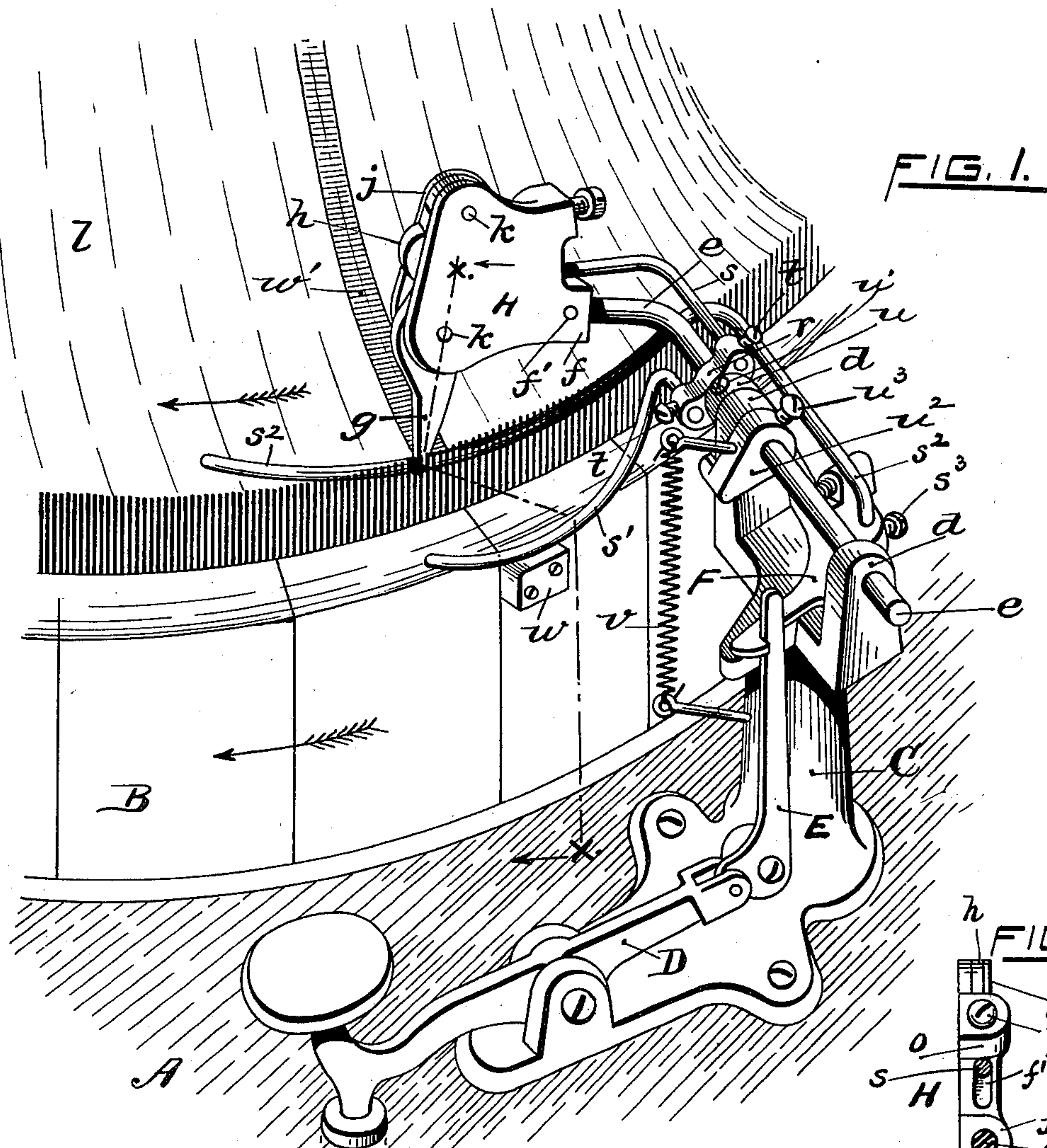
W. J. FERRIS.

STOP MOTION FOR CIRCULAR KNITTING MACHINES.

(Application filed Mar. 1, 1900.)

(No Model.)

3 Sheets—Sheet 1.



WITNESSES.

Robert W. Quibben
Augusta S. Merwath

INVENTOR.

William J. Ferris.

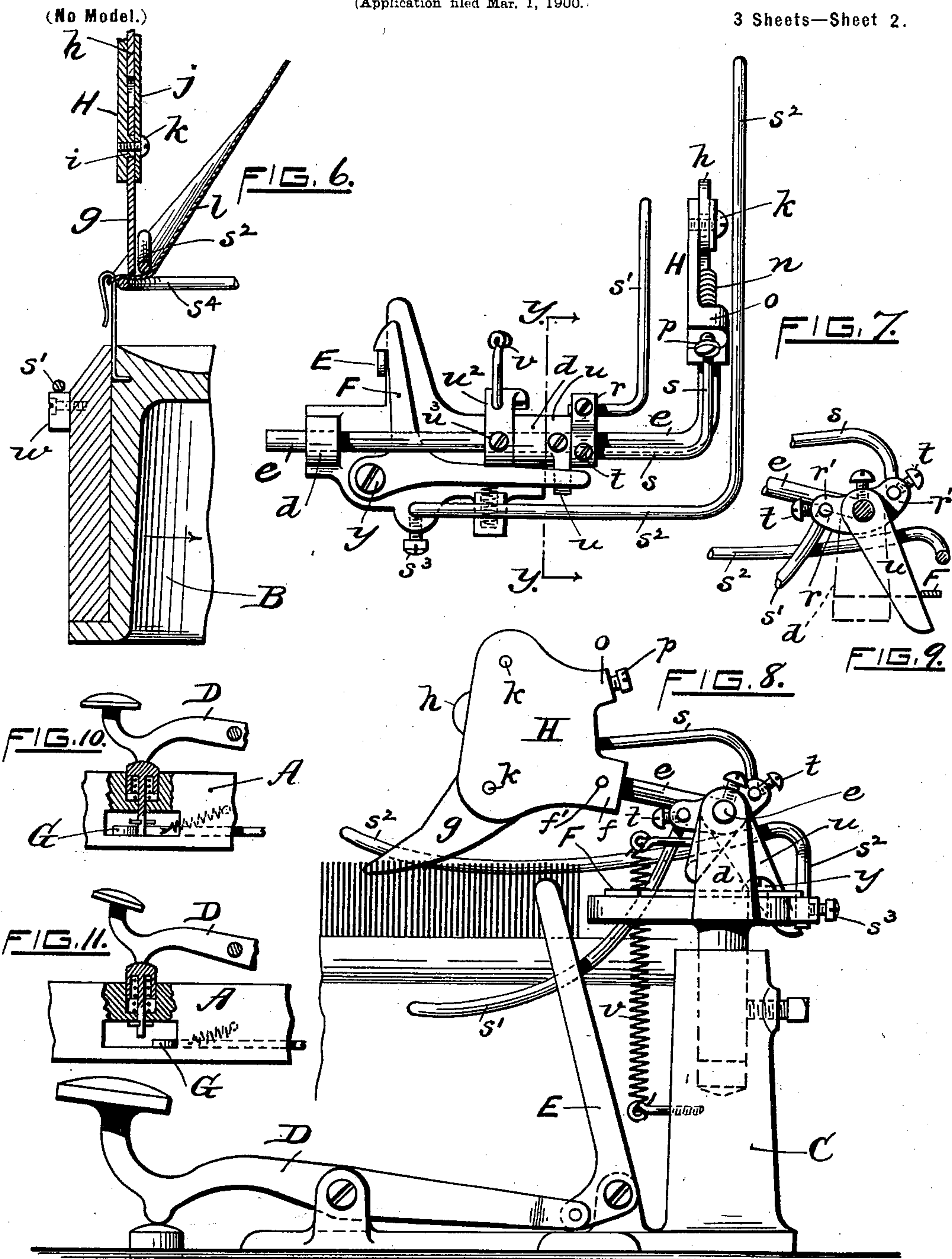
By Charles T. Hannigan.
Att'y.

W. J. FERRIS.

STOP MOTION FOR CIRCULAR KNITTING MACHINES.

(Application filed Mar. 1, 1900.)

3 Sheets—Sheet 2.



WITNESSES,

Robert W. Burbank,
Augusta S. Merritt

A

INVENTOR,

William J. Ferris.
By Charles T. Hannigan,
Atty.

No. 658,251.

Patented Sept. 18, 1900.

W. J. FERRIS.

STOP MOTION FOR CIRCULAR KNITTING MACHINES.

(No Model.)

(Application filed Mar. 1, 1900.)

3 Sheets—Sheet 3.

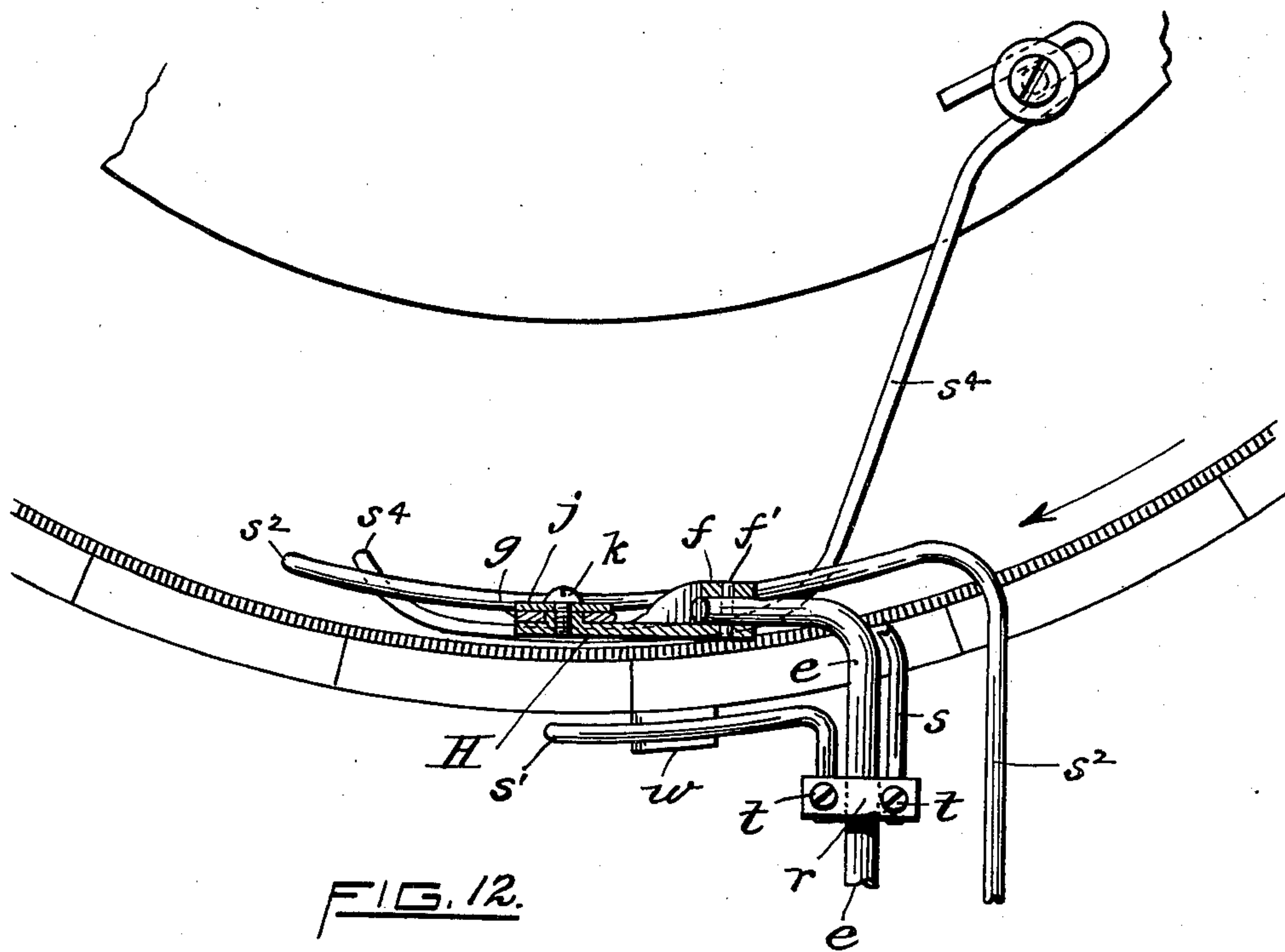


FIG. 12.

WITNESSES.

Robert L. P. P. P.
Augusta S. M. M.

INVENTOR.

William J. Ferris.

By Charles T. Hannigan.
Atty.

UNITED STATES PATENT OFFICE.

WILLIAM J. FERRIS, OF WOONSOCKET, RHODE ISLAND.

STOP-MOTION FOR CIRCULAR-KNITTING MACHINES.

SPECIFICATION forming part of Letters Patent No. 658,251, dated September 18, 1900.

Application filed March 1, 1900. Serial No. 7,005. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM J. FERRIS, a citizen of the United States of America, residing at No. 14 Hope street, in the city of Woonsocket, county of Providence, and State of Rhode Island, have invented certain new and useful Improvements in Stop-Motions for Circular-Knitting Machines, of which the following is a specification.

My invention relates to an improvement on stop-motions for circular-knitting machines shown and described in my Letters Patent, dated November 28, 1899, No. 637,929; and the special object of this improvement consists of a combination of parts to operate in connection with the ordinary stop-motion as used for circular-knitting machines, whereby the machine is instantly stopped when the presser-foot engages with a hole or such imperfection in the fabric during the progress of knitting; and the invention consists in the combination of parts as hereinafter described and claimed.

Referring to the drawings, Figure 1 represents a perspective view of a portion of a circular-knitting machine, showing the arrangement of parts of my invention when the machine is running. Fig. 2 is a front side elevation of the guide-box which carries the presser-foot and its spring-controlled latch-lever. Fig. 3 is a rear side elevation of the guide-box, showing the relative position of the presser-foot and latch-lever when the machine is in operation. Fig. 4 is a similar view of the guide-box with its cap removed and showing the position the parts assume when the presser-foot engages an imperfection in the fabric and the machine is stopped. Fig. 5 is a rear end elevation of the guide-box. Fig. 6 is a vertical radial section taken in line *xx* of Fig. 1, showing the relative position of the guide-box with its presser-foot bearing upon the knitted fabric. Fig. 7 is a top plan view of the standard, showing the arrangement of my device thereon. Fig. 8 is a front side elevation of the stop-motion, indicating the position the attachment assumes when the machine is stopped by a broken needle or imperfection in the cloth. Fig. 9 is a front side sectional elevation taken in line *yy* of Fig. 7. Fig. 10 is a detail view, on a small scale, of a portion of the bed of the

machine, partially broken away and showing the ordinary construction of spring-plug for holding the shipping-lever while the machine is running. Fig. 11 is a similar view showing the shipping-lever disconnected from the plug and the hand-lever thrown up as when the machine is stopped. Fig. 12 is a top plan sectional view of the guide-box and also showing the position of the rod connections in relation to the needle-cylinder.

Like letters of reference indicate corresponding parts in the different figures of the drawings.

A represents the bed of the machine; B, the needle-cylinder; C, the standard, having a base-plate screwed to the top of the bed; D, the hand-lever, pivoted on the base-plate of the standard; E, the vertical latch-lever, pivoted on the base-plate of the standard and engaging the end of the hand-lever; F, the horizontal angle-lever, pivoted to the top plate of the standard and having a latch end to engage with the vertical latch-lever, and G the shipping-lever and its releasing mechanism, as shown in Fig. 10. All of these parts are of the usual construction and arrangement, with which my improvement acts in conjunction.

The top portion of the standard C is fork-shaped, having two ears *dd*, in which is journaled the angle-shaft *e*. A guide-box H is mounted upon the extremity of the inner extended portion of said angle-shaft and has a boss *f*, through which a pin *f'* is driven to secure the said parts together, as shown in Fig. 3. This guide-box is situated directly over the path of the contiguous needles and carries two levers—the presser-foot *g* and trip-lever *h*. Said presser-foot is pivoted on a bearing *i* integral with the plate of the guide-box and adapted to bear against the surface of the knitted fabric close to the inner side of the contiguous needles. The trip-lever is pivoted on a bearing *i'* integral with the plate of the guide-box, and both of said levers are in the same plane and inclosed within the box by the cap *j*, through which enter screws *k*, which fit the screw-threaded openings in the bearings *i* and *i'* in the manner illustrated in Fig. 6.

Referring to Fig. 3, which shows a rear elevation of the normal position of the le-

vers in the guide-box as the fabric *l* moves in the arrow direction, it will be seen that the lower portion of the suspended trip-lever overlaps the upper edge of the presser-foot, and this position of the levers is maintained by the coil-spring *n*, which is interposed between the trip-lever and a boss *o* integral with the plate of the guide-box with a set-screw *p* entering said hub and bearing against the end of the spring for the purpose of giving greater tension upon the trip-lever, as the case may require. A lug *q* is formed on the plate of the guide-box to prevent the said trip-lever from swinging outward.

r represents a collar loosely mounted upon the angle-shaft *e* and having two lugs *r'* formed thereon, with a drilled opening in each to receive the ends of the rods *s* and *s'*, respectively, said rods being secured in place by the screws *t*.

Mounted upon the angle-shaft *e* is an arm *u*, situated on the inner side of the standard and adjoining the face of the aforesaid collar *r* and adjustably secured upon the said shaft by the set-screw *u'*. Said arm is made to engage with the horizontal lever *F*, pivoted at *y* (see Fig. 7) to the top plate of the standard.

A stop-arm *u*² is mounted upon the angle-shaft *e* between the ears of the standard and is adjustably secured to said shaft by the set-screw *u*³.

v is the pull-spring which keeps the presser-foot in contact with the cloth, having its ends connected to projecting screw-eyes attached to the aforesaid stop-arm *u*² and side of the standard *D*, respectively.

w is a block screwed to the front side of one of the plates of the cylinder and adapted to support the rod *s'* while the seam *w'* of the cloth is passing the presser-foot. Another rod *s*² is provided to bear against the top surface of the fabric and close to the inner side of the presser-foot, as shown in cross-section of Fig. 6, for the purpose of giving an easy depression in the fabric at the location of the presser-foot. Said rod is curved, as shown, and its outer end enters vertically through the top plate of the standard, where it is secured by the set-screw *s*³.

*s*⁴ represents a rod for supporting the fabric and is secured to the top of the inner stationary plate of the machine (see Fig. 12) and has its outer portion curving closely to the inner side of the contiguous needles between the same and point of contact of the presser-foot, and as the cylinder revolves this rod forms a support for the fabric at the time the same is passing the presser-foot, and in referring to Fig. 6 it will be observed that the presser-foot is located and operative in a vertical plane between the said supporting-rod *s*⁴ and aforesaid rod *s*².

To set my improvement for operating, the guide-box is first lifted up from the cylinder to its normal position, as indicated in Fig. 1, after which the protruding portion of the

trip-lever *h* is pressed inwardly, which allows the presser-foot to swing around by gravity to a vertical position, after which movement the trip-lever is released and its bottom portion overlaps the top edge of the presser-foot and holds the same in its normal position. When the trip-lever is released, its lower rear extension is brought up beyond the end of the rod *s*. (See Figs. 2 and 3.) The shipping-lever *G* is then brought forward in the slotted opening formed in the bed of the machine and held in place by the spring-plug. As indicated in Fig. 10, said plug is pressed downward by the hand-lever *D*, which movement causes the arm of the vertical latch-lever *E* to swing forward and engage upon the latch end of the horizontal angle-lever *F*, which in turn brings the fixed arm *u* of the shaft *e* to bear against the inner arm of the said horizontal angle-lever, as shown in Fig. 9, constituting the arrangement of parts forming the stop-motion when the machine is ready for knitting.

The operation of the herein-described mechanism is as follows: Assuming the attachment to be in the position for operating, as illustrated in Fig. 1, and the cylinder revolving in the arrow direction, if from any cause a needle should break or a hole should be made in the fabric during the progress of knitting by the time the cloth with such imperfection is passing upon the supporting-rod *s*⁴ the edge of the presser-foot will strike against the edge of the hole in the fabric and the movement of the fabric with the cylinder will swing the presser-foot from engagement with the spring-controlled trip-lever and the guide-box will be brought downward by the action of the pull-spring *v* to the position shown in Fig. 8, and this movement is limited by the stop-arm *u*² of the angle-shaft *e*, which strikes against the top plate of the standard. Simultaneously with the aforesaid movements the inner arm *u* of said angle-shaft will have swung rearwardly the horizontal angle-lever *F* from engagement with the vertical latch-lever *E* and the action of the spring-plug in the bed-plate will have released the shipping-lever *G*, and thus stop the machine.

Referring to Fig. 1, the rods *s* and *s'* are connected to the loose collar *r*, and when the seam *w'* of the cloth is passing the presser-foot the curved rod *s'* rises by contact with the block *w* of the cylinder-plate and at the same moment carries upward the rod *s* until its forward end is at the top of the slot *f''* of the guide-box and at the rear end of the trip-lever *h*. (See Figs. 2 and 5.) After the said rods assume this position the guide-box is slightly raised by the further movement of the remaining curved portion of the rod *s'* on the block *w*. The rod *s* is adapted for the purpose of lifting the guide-box and locking the trip-lever while the seam is passing and prevents the threads of the seam from turning the presser-foot. After the presser-foot has passed the seam the point of the

presser-foot is brought to bear against the cloth by the pull-spring *v* to the normal position, as indicated in Fig. 3.

Having described my invention, what I claim is—

1. In a stop-motion for circular-knitting machines having a shipping-lever, an oscillating angle-shaft, and means intermediate said lever and shaft whereby the latter is enabled to control the operation of the former, the combination therewith of a guide-box mounted vertically upon the inner end of said angle-shaft and consisting of two parallel plates one of which has an internal shoulder at its forward portion and a boss formed upon its rear portion having an interior screw-threaded opening, a set-screw to fit the opening of said boss, a presser-foot pivoted at the lower end of the guide-box between said plates and extending downward therefrom, a trip-lever pivoted in said guide-box between said plates and having its lower end adapted to engage with the upper end of said presser-foot, with an expansion-spring interposed between said trip-lever and said set-screw and acting normally to hold the trip-lever in contact with said shoulder, substantially as and for the purpose specified.

2. In a stop-motion for circular-knitting machines having a shipping-lever, an oscillating angle-shaft, with means intermediate said lever and shaft whereby the latter is enabled to control the operation of the former, the combination therewith of a guide-box mounted upon the end of said shaft and provided with a vertical slotted opening in the rear portion of one of its plates, a presser-foot and trip-lever pivotally mounted between said plates and engaging each other at their contiguous ends, a loose collar mounted upon the said shaft and having two extending lugs integral therewith and each provided with a circular opening, an angle-rod mounted in one of the lugs of said collar and having its opposite end extending through said slotted opening of the guide-box, a curved rod mounted in the other hub of said collar, each of said rods adjustably secured in position by a set-screw as shown, with a block secured to one of the plates of the cylinder and movable therewith, adapted to support the said curved rod and angle-rod, respectively, to prevent the presser-foot from being tripped while the

seam in the fabric passes the same, as shown and described.

3. In a stop-motion for circular-knitting machines having a shipping-lever, a standard secured to the top of the bed of the machine, an oscillating angle-shaft mounted in the ears of said standard, and means intermediate said lever and shaft whereby the latter is enabled to control the operation of the former, the combination therewith of a guide-box secured to the said angle-shaft, a presser-foot pivoted at the lower end of the guide-box, a trip-lever pivotally mounted in the guide-box and having its lower end arranged to engage with the upper end of the presser-foot, a spring interposed between the plates of the guide-box and bearing against said trip-lever, with the angle-rod *s*² having one end bent downwardly to enter the top plate of said standard and the inner extended portion curved to bear against the top of the fabric and close to the inner side of the presser-foot, with a set-screw to enter the plate of the standard to adjustably secure the last-foresaid rod in position, as shown and described.

4. In a stop-motion for circular-knitting machines having a shipping-lever, a standard secured to the top of the bed of the machine, an oscillating-shaft, with means intermediate said lever and shaft whereby the latter is enabled to control the operation of the former, the combination therewith of a guide-box mounted upon the inner end of said shaft, in which box is mounted a presser-foot and trip-lever engaging each other at their contiguous ends, the curved rod *s*² adjustably mounted in the top plate of said standard as shown and having its inner extended portion to bear against the top of the fabric and close to the inner side of the presser-foot, with the supporting-rod *s*⁴ adjustably secured to the stationary plate of the machine as shown and having its outer portion curved to lie close to the inner sides of the contiguous needles, between the vertical plane of the presser-foot and beneath the knitted fabric, as shown and described.

Signed by me at Providence, Rhode Island, this 26th day of February, A. D. 1900.

WILLIAM J. FERRIS.

Witnesses:

ROBERT W. BURBANK,

AUGUSTA S. MEREWETHER.