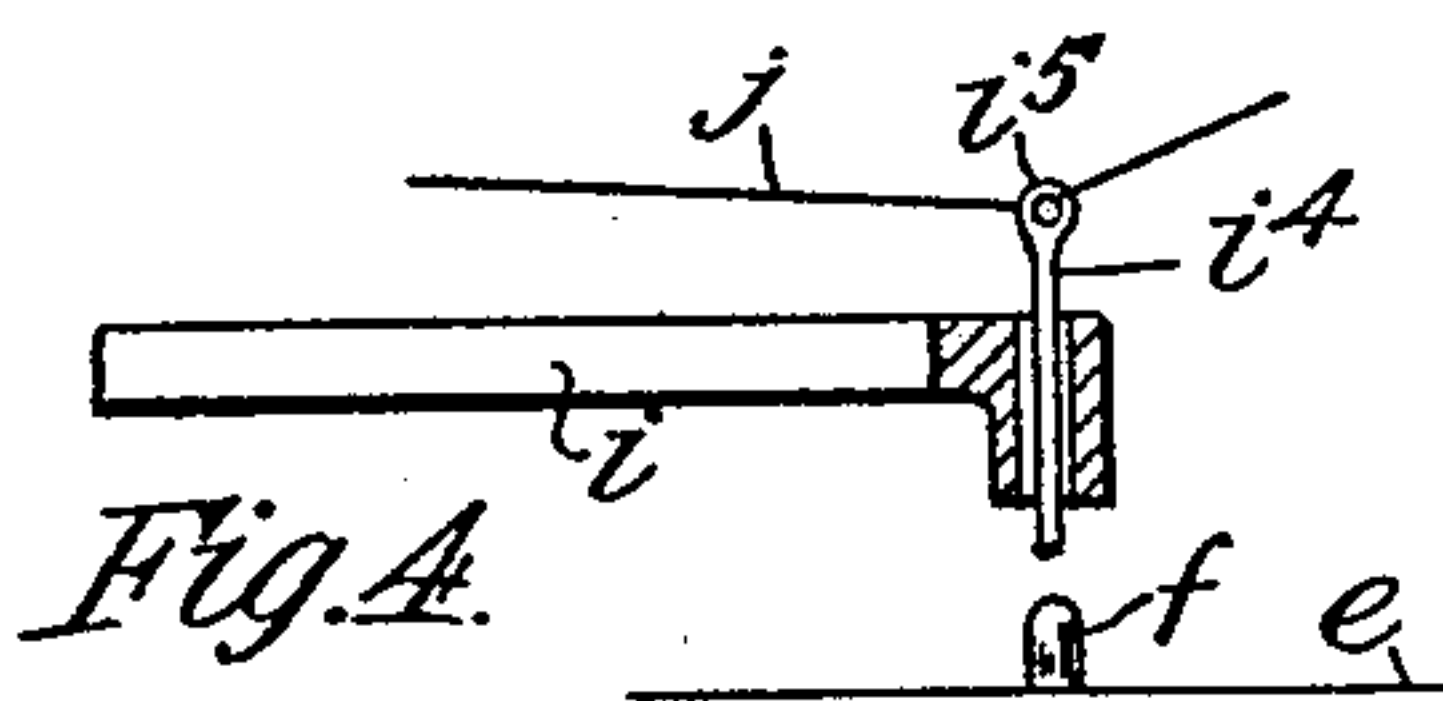
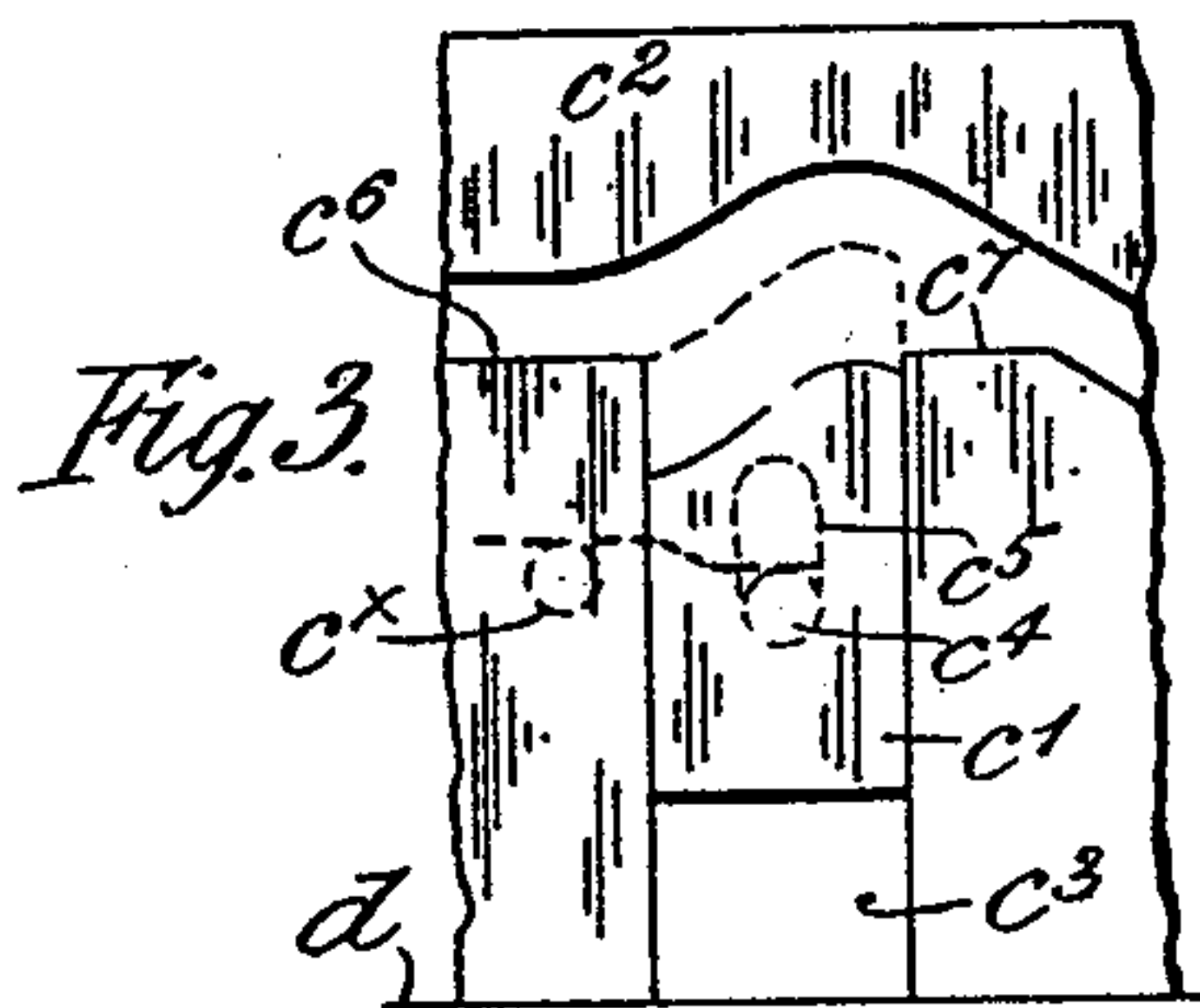
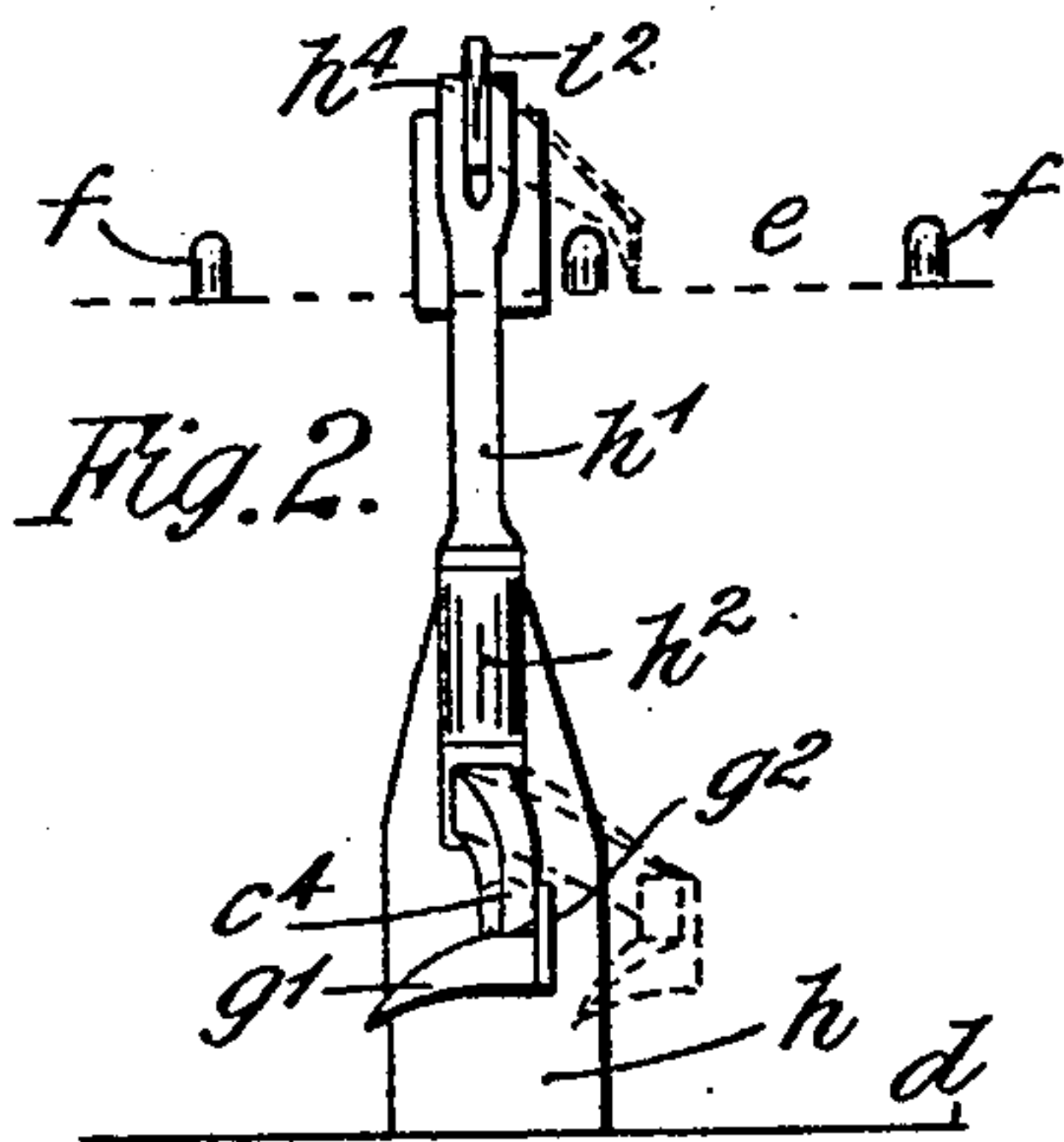
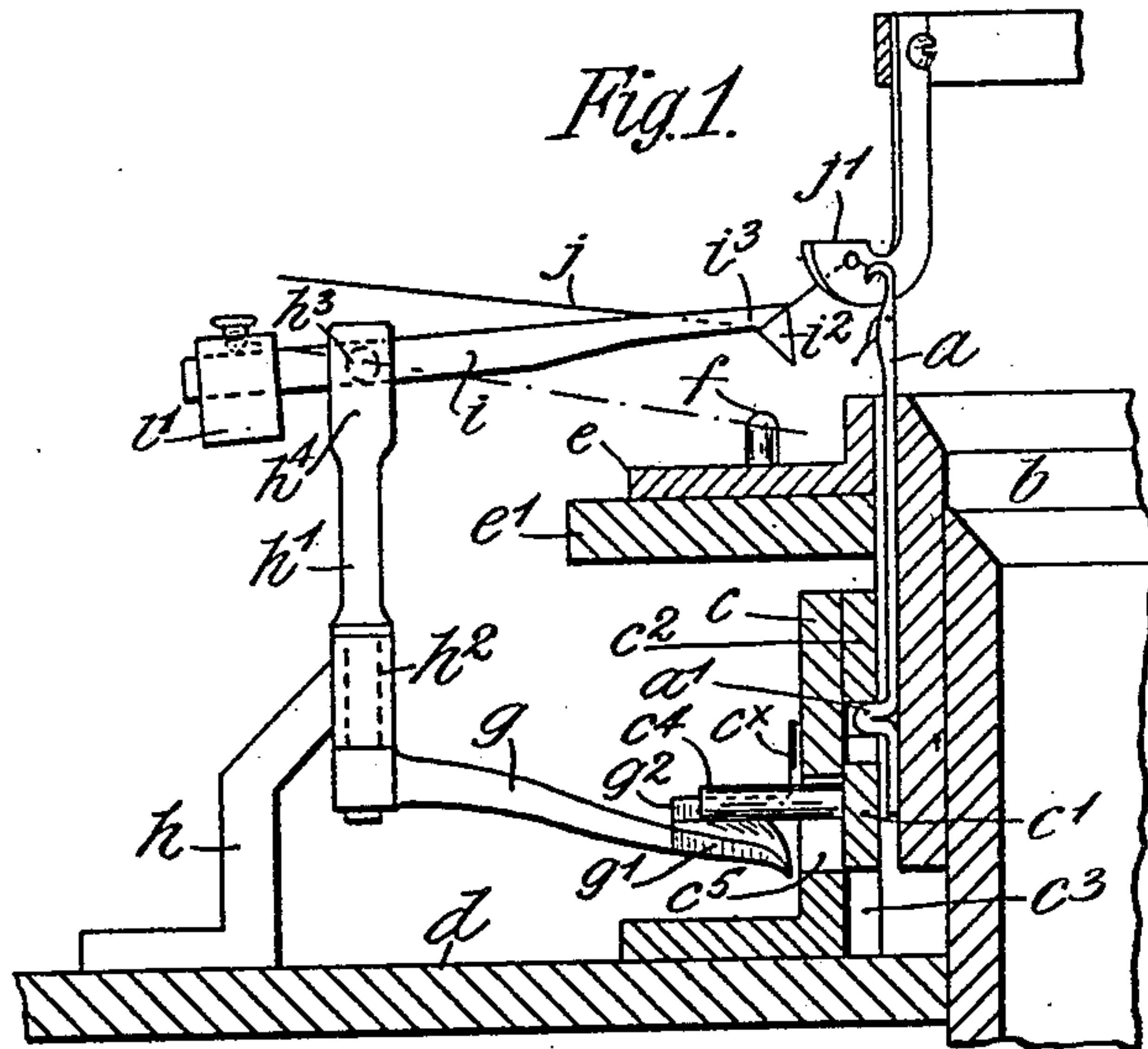


No. 832,513.

PATENTED OCT. 2, 1906.

F. TAYLOR.
STOP MOTION FOR KNITTING MACHINES.
APPLICATION FILED JAN. 27, 1906.



Witnesses:
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UNITED STATES PATENT OFFICE.

FRANK TAYLOR, OF NOTTINGHAM, ENGLAND, ASSIGNOR TO THE BRITISH
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STOP-MOTION FOR KNITTING-MACHINES.

No. 832,513.

Specification of Letters Patent.

Patented Oct. 2, 1906.

Application filed January 27, 1906. Serial No. 298,266.

To all whom it may concern:

Be it known that I, FRANK TAYLOR, mechanic, a subject of the King of Great Britain, residing at 64 Chandos street, Coppice Road, Nottingham, in the county of Nottingham, England, have invented a certain new and useful Stop-Motion for Knitting-Machines, of which the following is a specification.

This invention relates to hosiery and like machines, and has reference more particularly to contrivances for throwing the needles out of action at certain times when passing the feeders, such contrivances being designed to act mainly as safety devices for use chiefly on hosiery-machines for the purpose of guarding against the consequences of the accidental breaking of one or more of the yarns.

The invention is specially applicable to hosiery-machines having a large number of feeders—say up to sixteen or more—such, for instance, as referred to in the specification of United States Patent No. 762,142, dated June 7, 1904.

The main object of the invention is to guard against the occurrence of what are known as “press-offs” or gaps in the work, (with the consequent damage to the needles,) due to breakage of a yarn, or to reduce to a minimum the extent of the press-off should it occur.

In ordinary safety devices, such as are known as “stop-motions,” the breakage of a yarn is caused to effect the stoppage of the machine; but this takes an appreciable time to act, and a considerable amount of work is spoiled, and a very large number of needles may become unthreaded—that is to say, lose their loops—before the stop-action can operate, and the machine may be seriously damaged. According to the present invention, however, it is only the parts appertaining to the particular feeder where the break has occurred that are affected, the action of the improved safety device being such that the cams no longer lift the needles when passing this feeder, and the said needles simply remain idle without losing their loops. In fact, they carry the loops from the previous feeder along with them until they reach the

next feeder, whose yarn is unbroken, whereupon they operate as usual. Hence there is practically no interruption in the continuity of the knitting—that is to say, in the fabric itself—the only effect of a breakage (or breakages) being that one (or more, as the case may be) yarn less is fed to the work and a (slight) reduction of speed of output or manufacture results until the broken yarn is restored. The principle on which the invention depends, therefore, is the provision of an antipress-off device for putting the needle-cam at any particular feeder out of operation the instant a breakage of the yarn occurs at that feeder, or should a bobbin empty itself or an end come up which may have been broken in winding no hole or gap would occur. This cam then remains out of action until the yarn is rethreaded and the device is reset by the operator; but no press-off hole or gap or only a very small one occurs in the work, except, perhaps, in extreme cases where the break occurs close to the feeder-eye, and even then the extent of the press-off is still only very small, being measured by the extremely short interval required for the device to act, and the working of the machine is not interfered with, so that even if the attendant failed to notice the breakage no damage would result.

According to one example of an arrangement embodying the invention the cam may be made with its “lift” portion—i. e., that for raising the needles—as a separate piece or slide and be provided with a pin extending through a slot in the cam-cylinder. This pin is normally raised to keep the cam in the working position by a wedge-shaped piece or head at the end of a swiveling arm. The arm extends from a vertical axle, which also carries at its upper end a counterweighted lever or feeler normally kept raised by the yarn as it passes to the feeder. In combination with this feeler-lever is a set of studs or projections on any convenient part of the machine, such part being so chosen that the projections revolve past the lever, or vice versa. Should the yarn break, the lever drops instantly and is struck by (or strikes) one of the studs or projections, thus moving the swiveling arm aside, so releasing the pin and allowing the cam-slide to drop out of

action. After the yarn is replaced the attendant need only press the arm into position again, when the wedge-piece acts on the pin and again raises the lift cam or slide into
5 action.

In order that the invention may be more clearly understood, reference will now be made to the accompanying drawings, in which the same is illustrated by way of ex-
10 ample.

In the drawings, Figure 1 is a side view of one form of the feeler and swiveling arm, the adjacent or associated parts of the safety device and of the knitting-machine being indicated in section for the sake of clearness, the machine in this case being understood to have a revolving cylinder. Fig. 2 is a front or end view of the said feeler and swiveling arm. Fig. 3 is a detail view, to a larger scale,
15 indicating the manner in which the cam is formed, so that the lift portion can slide up and down in order to come into action or to drop out of action. Fig. 4 illustrates an alternative or modification which may be
20 adopted in the construction of the feeler.

Referring more particularly to Figs. 1 and 2, *a* is one of the needles of the machine. *b* is the needle-cylinder, which in this case revolves. *c* is the stationary cam-cylinder, having cams *c'* and *c''* inside it in the ordinary way, and *d* is the main platform or table of the machine. *e* is any convenient revolving ring or part adapted to rotate with the cylinder and suitable for carrying the series of
25 studs or the like *f*, hereinafter referred to. It may, for instance, be an ordinary part of the machine, or it may be a special ring sliding round on a fixed ring or table *e'*, as may be most convenient, according to the construction of machine to which the invention is applied.
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As regards the parts to which the invention more particularly relates—i. e., the safety arrangement or device—the lower
35 cam *c'*, which is what is termed the "lift-cam," is made in the form of a slide and is arranged to work up and down, as indicated more clearly in Fig. 3, the upper cam *c''* for forcing the needles down being made fixed, as
40 usual. The said lower or lift cam *c'* works in a suitable groove or recess, such as *c''*, in which it is guided in any convenient way—such, for instance, as by undercutting the edges of the groove. From the cam projects
45 a pin *c''*, Fig. 1, working through a short slot or aperture *c''* in the cam-cylinder *c*. By means of this pin the cam-slide *c'* can be pushed up or down, its upper or working position being indicated by dotted lines, Fig. 3,
50 the lower or full-line position being that in which it is out of action or idle, so that the needle-butts *a'* pass clear across from one flat surface *c''* to the other, *c''*, without touching the cam *c'* at all, and consequently without being

raised and lowered. In order to better insure the quick descent of the cam *c'*, a spring, such as *c''*, may be arranged in any convenient manner, so that it tends to press it constantly in a downward direction.
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In normal working the pin *c''* is kept in its upper position, so as to raise the cam *c'* against the action of the spring *c''* by means of the approximately horizontal wedge-shaped head *g'* of the arm *g*. This arm is mounted on a vertical spindle *h'*, working in a sleeve or collar *h''*, carried by a bracket *h* on the table
70 *d*. At its upper end the spindle *h'* carries the feeler-arm *i*, which may be of any suitable kind, but in the present example is shown as consisting of a plain lever pivoted at *h''* in a fork *h''* at the top of the spindle. At one end of the feeler-arm *i* is an adjustable counterweight *i'* or a spring or the like, while at the other end is a downwardly-projecting nib *i''*.
75 In this case the nib forms an angle or bend, as at *i''*, under which the yarn or thread *j* can be bent in its passage to the yarn-feeder *j'*, although an eyelet may be provided for the yarn at the end of the feeler. The construction of the said feeler-arm may be modified
80 in various ways so long as the arrangement is such that the yarn normally keeps its nib or point *i''*, or the part corresponding thereto, clear of the studs *f*, which are revolving beneath it. Should a break, however, occur in
85 the yarn, the said feeler-arm *i* will be allowed to drop. (See dotted line, Fig. 1.) In the latter position the studs *f* will instantly strike the nib *i''* and trip or knock aside the feeler-lever, the spindle *h'*, and the arm *g*.
90 These parts being then in the position of the dotted lines, Fig. 2, the pin *c''* is no longer supported by the wedge-piece *g'*, and the cam *c'* immediately drops into the lowest position and allows the needles to pass without operating them, thus avoiding any risk of their becoming unthreaded at the broken feeder and allowing them to remain at rest until they reach the next feeder, where the yarn is unbroken. One alternative form of feeler-arm is shown in Fig. 4, in which the arm
95 itself, *i*, is fixed and has a sliding or drop pin *i''* working through a hole or eye in its extremity *i''*. The pin is normally held up clear of the stud *f* by the yarn, as before; but instantly the latter breaks it drops into the path of the studs, trips the feeler arrangement, and allows the cam *c'* to drop out of action. In either case in order to reset the parts it is only necessary to press the swivel-
100 ing arm *g* of the feeler arrangement back into the full-line position, Fig. 2, when the wedge *g'* inserts itself under the pin and again raises the cam, the motion being stopped by a lip or flange *g''*, which comes in contact with the pin. In other words, it is not necessary to manipulate the said pin or the cam in any way, a simple pressure sidewise on the arm *g*
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being sufficient to restore the parts to the working position.

What I claim, and desire to secure by Letters Patent of the United States, is—

- 5 1. A hosiery-machine having latch-needles, cams for raising and lowering said needles in the knitting action, and means for throwing said cams out of action on the breakage of a yarn, substantially as described.
- 10 2. In a hosiery or knitting machine, the combination of a plurality of yarn-feeders, a cam at each feeder for operating the needles, and means for rendering any needle-cam inoperative when the yarn of the corresponding
15 feeder breaks, in order to enable the needles to remain idle when passing the feeder where the break has occurred so preventing the needles losing their loops, substantially as and for the purposes indicated.
- 20 3. In a hosiery or knitting machine, the combination of a plurality of yarn-feeders, a cam at each feeder for operating the needles, and means whereby on the breakage of a yarn, the corresponding needle-cam is put out of
25 operation and the needles are allowed to pass without losing their loops and remain idle until the next yarn-feeder is reached, for the

purpose of preventing the formation of press-offs, substantially as described.

4. In a hosiery or knitting machine, the combination of a needle-cam, means for moving such cam into or out of position to engage the needles, and means for causing the cam to assume its inoperative or idle position on the breakage of a yarn in order to enable the
35 needles to pass without losing their loops and without stopping the machine, substantially as described.

5. In a hosiery or knitting machine having a plurality of feeders, the combination of a
40 movable needle-cam, a feeler arrangement for controlling the position of said cam, a wedge-shaped piece for retaining the needle-cam in its normal working position, and means for disengaging said wedge on the
45 breakage of a yarn.

In testimony whereof I have hereunto set my hand, in presence of two subscribing witnesses, this 10th day of January, 1906.

FRANK TAYLOR.

Witnesses:

WM. H. FACON,
G. DEVERILL.