

No. 752,732.

PATENTED FEB. 23, 1904.

S. W. WARDWELL.

SLUB DETECTOR.

APPLICATION FILED FEB. 26, 1902.

NO MODEL.

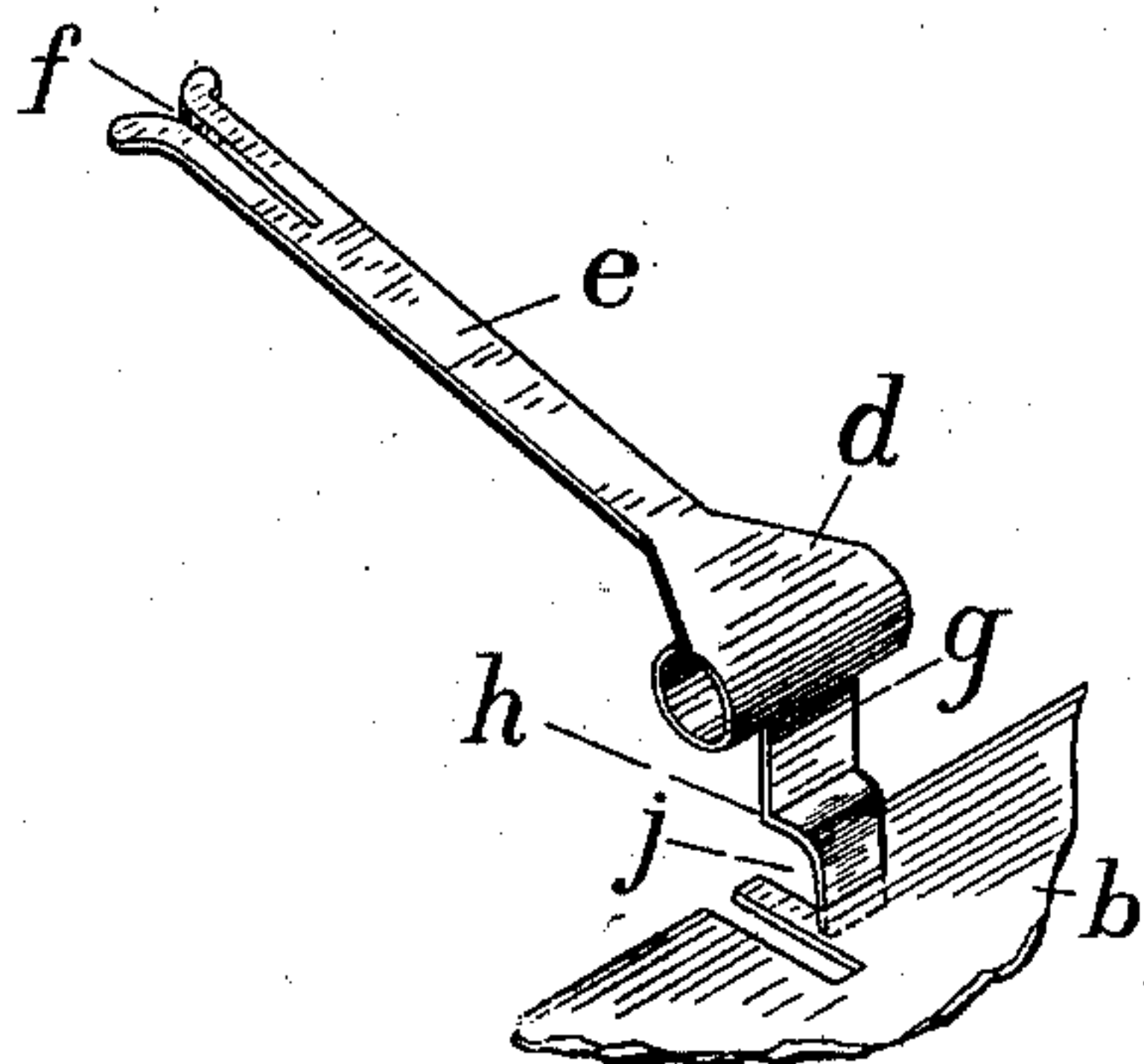


Fig. 2.

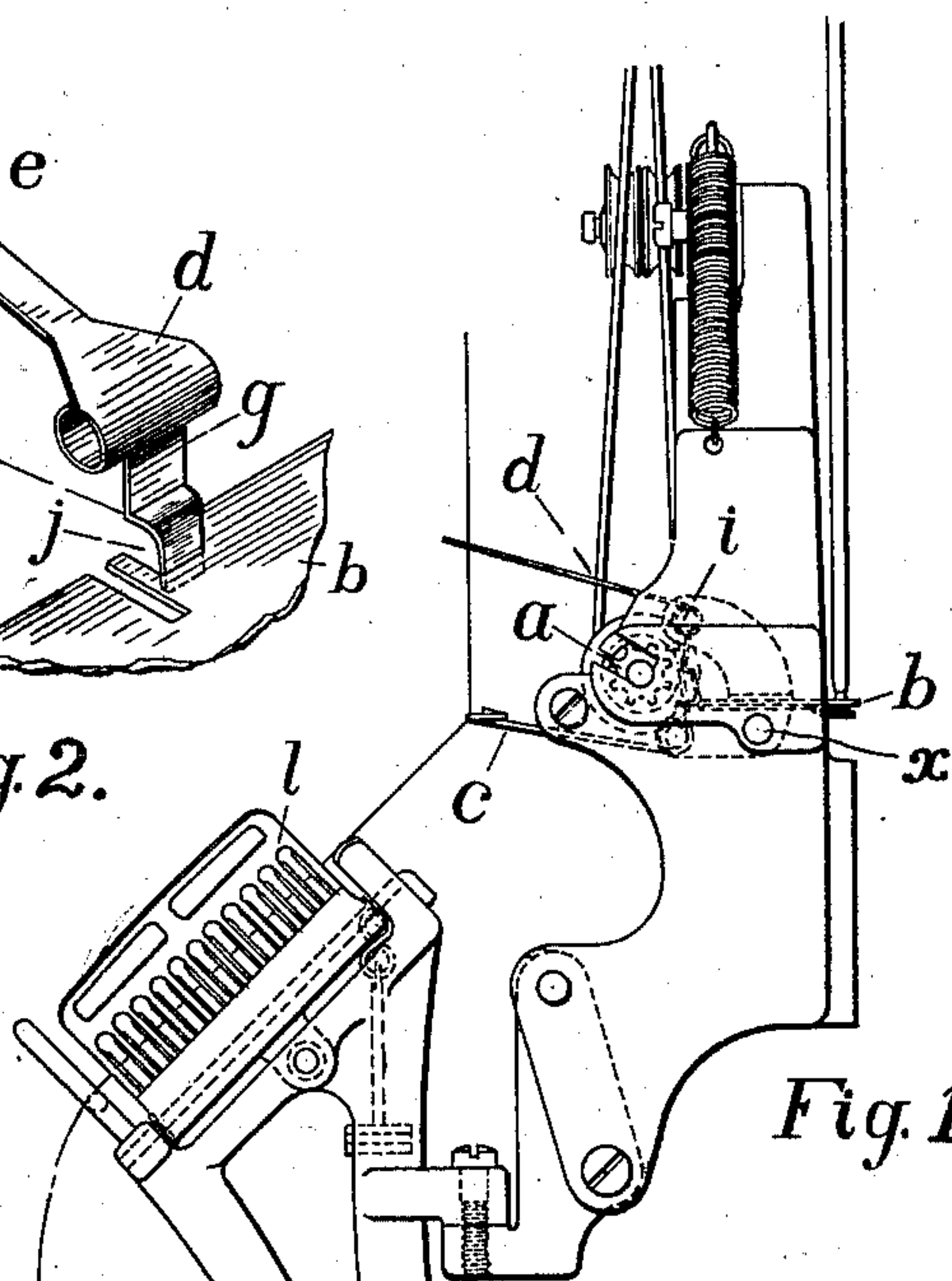


Fig. 1.

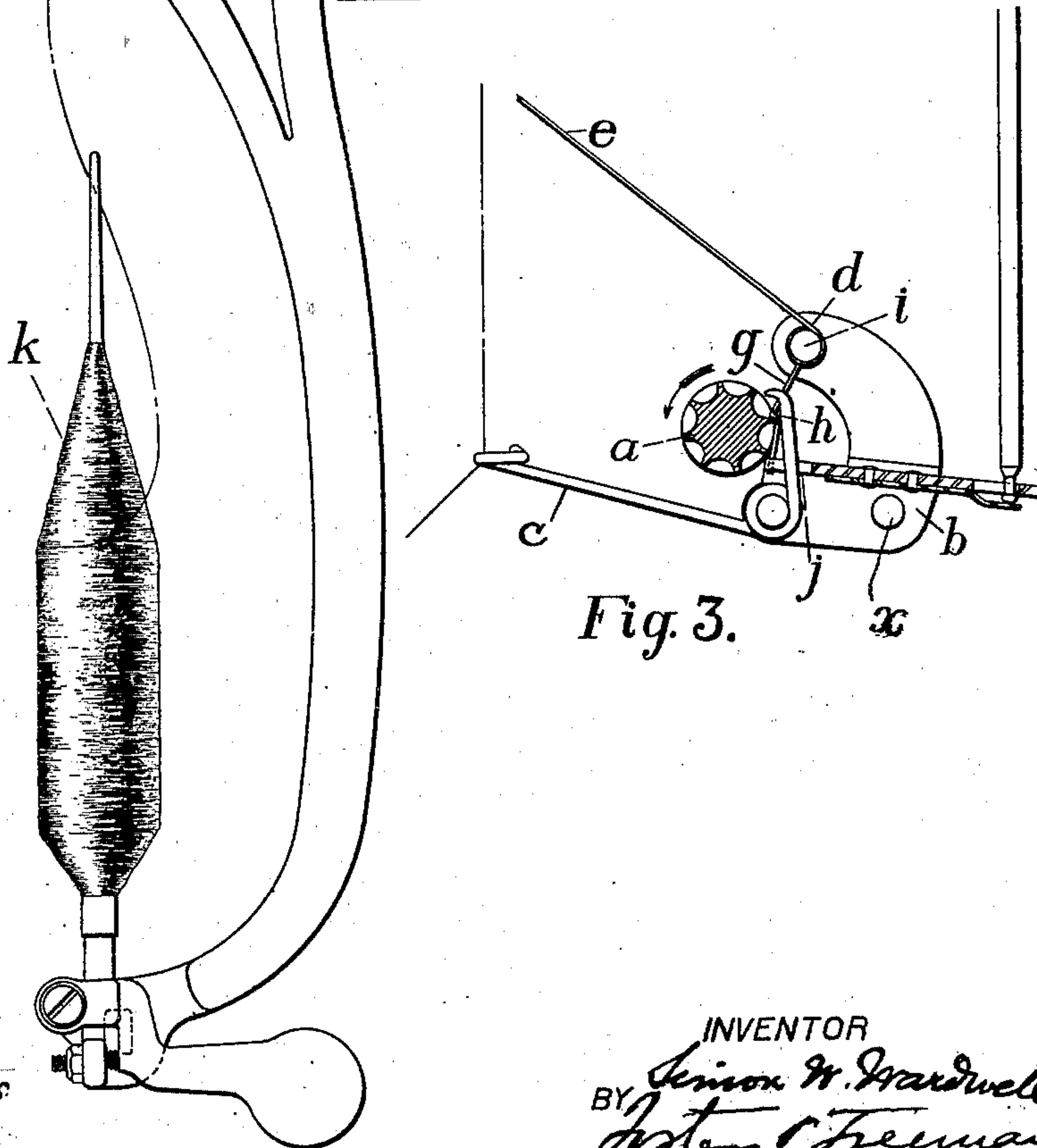


Fig. 3.

WITNESSES

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# UNITED STATES PATENT OFFICE.

SIMON W. WARDWELL, OF PROVIDENCE, RHODE ISLAND, ASSIGNOR TO  
UNIVERSAL WINDING COMPANY, OF PORTLAND, MAINE, A CORPORATION OF MAINE.

## SLUB-DETECTOR.

SPECIFICATION forming part of Letters Patent No. 752,732, dated February 23, 1904.

Application filed February 26, 1902. Serial No. 95,743. (No model.)

*To all whom it may concern:*

Be it known that I, SIMON W. WARDWELL, residing at Providence, in the county of Providence and State of Rhode Island, have invented a new and useful Slub-Detector, of which the following is a specification.

My invention relates to yarn-controllers for doubling or other textile machines, and particularly to devices for detecting the presence of bunches or slubs and for automatically causing the winding to be arrested whenever such bunches or slubs occur without breaking the yarn.

The following specification fully sets forth the nature of my invention and the manner of its operation, and the accompanying drawings, forming part of the specification, represent, respectively, in—

Figure 1, a side view of the stop-motion of the machine in conjunction with my new device; Fig. 2, a detail view of the detector, showing a small portion of the stopping-plate to indicate its relation thereto; Fig. 3, a sectional view of a portion of the stop-motion devices, showing the manner in which the detector acts thereon to cause them to arrest the winding.

My invention is herein described and shown applied to stopping devices such as are described in my United States Patent No. 598,587, in which "drop-wires" or breakage-levers adapted to engage a rotating fluted roll to arrest the winding are withheld from such engagement during the winding by the tension of the yarn passing through them. The detector may, however, be employed with other forms of stopping devices which comprise a constantly-moving member from which the stopping of the machine is effected through the engagement therewith of drop-wires or their equivalents.

In the following description and claims the term "slub" will be employed to denote any enlargement of the yarn, such as a large knot or bunch of fiber incorporated into the yarn.

The stop-motion device illustrated comprises a rotating corrugated roll *a*, a tilting plate *b*, pivoted at the point *x*, connected

with the stopping devices of the machine, and drop-wires *c*, which when unsupported by the tension of the yarn fall, engage the rotating corrugated roll, and, lifted thereby, tilt the plate and effect the stopping of the machine. Mounted on the tilting plate adjacent each breakage-lever is a detector *d*, formed with a long projecting arm *e*, at the extremity of which is a narrow slit *f* of sufficient width to pass the yarn, but so narrow that no slub or bunch can pass through, and with a second arm *g* substantially perpendicular thereto. This second arm has a shoulder *h*, which when the arm *e* is sufficiently raised engages the corrugated roll *a* and causes the plate *b* to tilt to stop the winding in the same manner as does the engagement therewith of a drop-wire. The arm *g* is of such length and so formed that the shoulder *h* cannot engage the roll *a* to an extent greater than is necessary to cause the tilting of the plate *b* and a movement of the detector, as hereinafter described. The detectors are preferably mounted on a rod *i*, secured to the tilting plate, and prevented from longitudinal movement thereon by notches or recesses *j* in the edge thereof, with which the extremities of the detector-arms *g* engage.

The operation of my improved device is as follows: Yarn is drawn from the supply *k* through the tension *l*, the drop-wire *c*, and the slit *f* of the detector *d*. In case a slub or a bunch occurs it engages the detector, raising the arm *e* and swinging the arm *g* and its shoulder *h* into engagement with the corrugated or fluted roll *a*, which, rotating constantly in the direction indicated by the arrow in Fig. 3, raises the detector bodily, thereby tilting the plate *b* and causing the stopping of the winding, as hereinbefore described. The drop-wires *c* operate as in the machine of my Letters Patent No. 598,587. The engagement of the detector with the corrugated roll not only causes the plate *b* to tilt, but also removes the detector from the yarn, as shown in Fig. 3, permitting the slub to pass on without breaking the yarn after it has caused the stopping devices to arrest the winding. This



provision is essential, as otherwise the broken end would run into the package, for when a yarn breaks it parts at the point of greatest strain, which in winding is at the thread-guide close to the package. At this point the yarn is subject to the accumulated resistance due to delivery from the supply to the tension devices and to the various guides through or over which it has passed in its course from the supply to the thread-guide by which it is delivered to the winding. When an end thus runs in, the operator usually breaks all the ends, unwinds the yarn from the package until the broken end is found, and then ties all the ends together in a "bunch" knot, that is worse than any slub which the detector is designed to eliminate. When the machine is stopped without breaking the yarn, the slub can be readily removed without the loss of time and waste of yarn incident to breaking and piecing all the ends and to tying each individual yarn and so separating the knots as to cause no bunch.

The device herein described is peculiarly adapted for use with yarns having little tenacity, because the only resistance to be overcome by the yarn in effecting the stopping of the winding is the weight and inertia of the detector, which can be made very light. A further advantage is its independence of the tension and other correlated devices. It is obviously applicable to various forms of stop-motion mechanism and to other machines than winding-machines.

Therefore, without limiting myself to the precise form, arrangement, or mode of connection of my new device, I claim as my invention—

1. The combination with a rotating fluted roll and the stopping devices of a machine, of a detector through which a running yarn passes, said detector having a shoulder portion normally held away from said roll but movable into engagement therewith when a slub in the yarn engages the detector, and the latter being movable by the roll when engaged therewith to operate the stopping devices and release the slub.

2. The combination with the stop devices and a rotating member of a machine, of a detector movably supported adjacent to a running thread out of position to engage said rotating member, but to directly contact therewith when moved by a slub in the thread, and means connected with the detector to actuate the stop devices of the machine on the movement of the detector by the rotating member.

3. The combination of a rotating fluted roll member of a machine, a slitted detector movably supported adjacent to a running thread out of position to engage said rotating roll member but to directly contact therewith when moved by a slub, and means connected with the detector to actuate the stop devices of the

machine, on the movement of the detector by the rotating member.

4. The combination of a rotating member of a machine, a detector supported adjacent a running thread out of position to engage said rotating member but to directly contact therewith when moved by a slub, and means connected with the detector to actuate the stop devices of the machine on the movement of the detector by the rotating member, said latter movement effecting the release of the slub.

5. The combination with the moving member of a stop-motion device of a machine, of a slotted detector supported adjacent to a running thread out of engagement with the moving member but in position to directly engage the same when the detector is shifted by a passing slub, said detector bodily moved to actuate the stop device without arresting or putting stress upon the thread.

6. The combination with a rotating fluted roll and a tilting plate to be moved from the roll to arrest the winding, of a detector, with a slit for the passage of the yarn, mounted on said tilting plate, maintained normally away from the roll but adapted to be moved by a slub into engagement therewith, to cause the latter to tilt the plate for the purposes and in a manner substantially as described.

7. The combination with a fluted roll *a*, a tilting plate *b* from which the stopping devices of a machine may be operated and a rod *i* secured to the plate, of a detector *d* mounted on said rod, comprising an arm *e* with a slit *f* through which the yarn runs, and an arm *g* with a shoulder *h* adapted to engage the roll for purposes and in a manner substantially as described.

8. The combination with a fluted roll *a*, a tilting plate *b* from which the stopping devices of a machine may be operated and a rod *i* secured to the plate, of a detector *d* mounted on said rod, comprising an arm *e* with a slit *f* through which the yarn passes, and a second arm *g* having a shoulder *h* which, when engaged with the said roll, causes the plate to tilt to arrest the winding and then causes the yarn to be disengaged from the detector.

9. The combination in a stop-motion device for a machine, with a tilting plate *b*, a rod connecting the plate with the stopping devices of the machine, and a fluted roll *a* from which the plate is tilted to cause the stopping devices to act, of a rod *i* secured to the plate and detectors mounted on said rod, having slits through which the yarn passes and prevented from longitudinal movement on the rod by notches *j* in the edge of the plate, with which notches the arms *g* of the detectors engage.

10. The combination with a moving member of a textile-machine, of a slub-detector comprising an arm *e* having a slit *f* of a width to just permit the passage of the yarn, but sufficiently narrow to prevent the passage of



a slub, and an arm *g* having a shoulder *h* to engage the moving member to thereby cause the movement of said detector bodily, to effect the stopping of the machine, substantially as described.

11. The combination with a constantly-moving member of a machine-stopping device, of a slub-detector comprising in one piece an arm *e* with a slit *f* through which the yarn passes and which is too narrow to pass a slub, and a second arm formed with a shoulder to engage the moving member, and means to limit the degree of said engagement.

12. The combination with a rotating fluted roll, of a slub-detector for textile-machines, comprising in one piece an arm *e* with a slit *f* through which the yarn passes, and which is too narrow to pass a slub, and a second arm formed as shown with a shoulder *h* to engage

the fluted roll, having an offset portion which limits the degree of engagement of the shoulder *h* with said roll.

13. The combination with a rotating fluted roll, of a slub-detector for textile-machines comprising in one piece an arm *e* with a slit *f* through which the yarn passes and which is too narrow to pass a slub, and a second arm with a shoulder to engage the fluted roll and whereby the arm *e* is positively moved away from the yarn.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

SIMON W. WARDWELL.

Witnesses:

JOSHUA B. HALE,  
FRANK E. DEFFLEY.