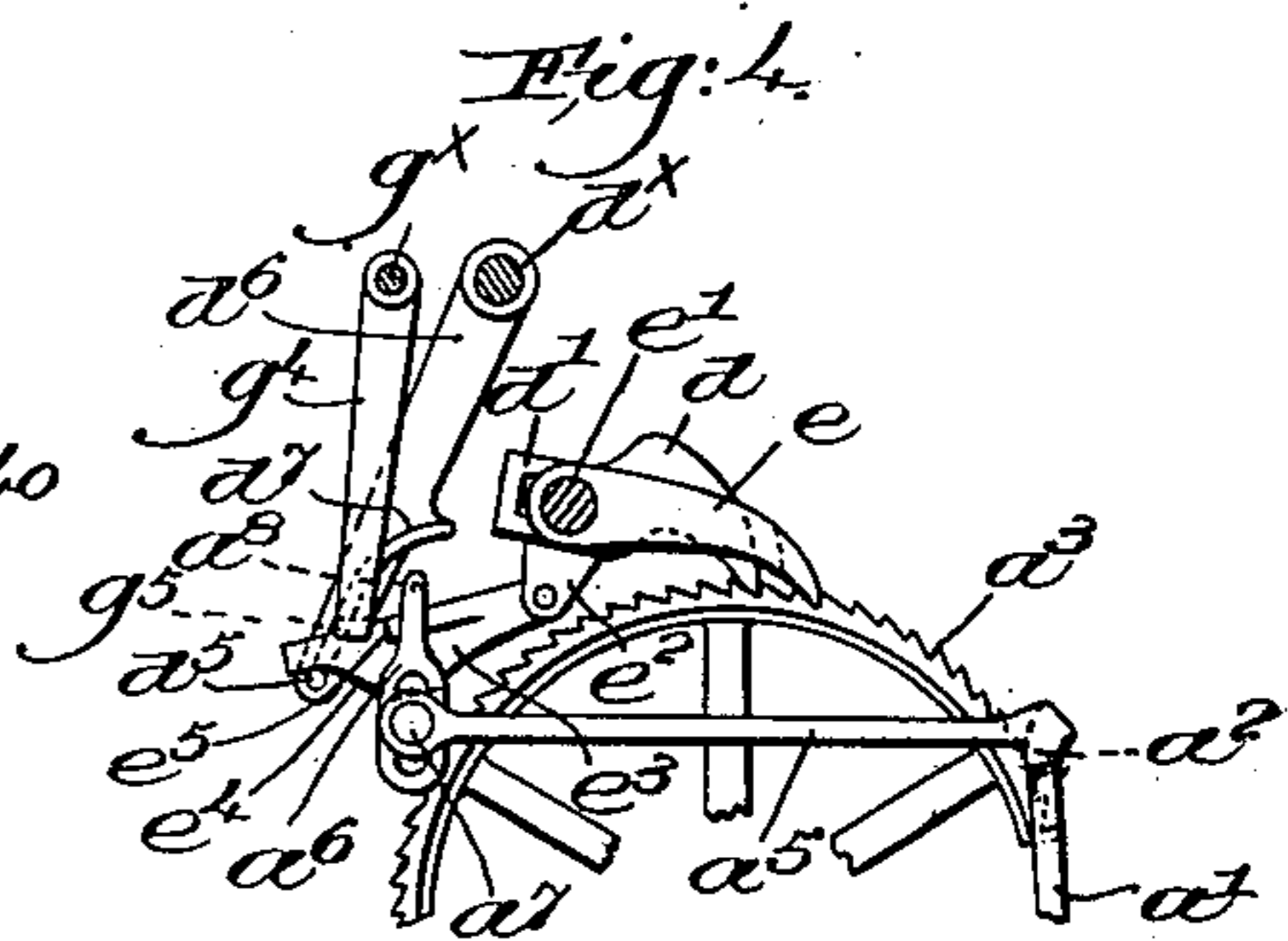
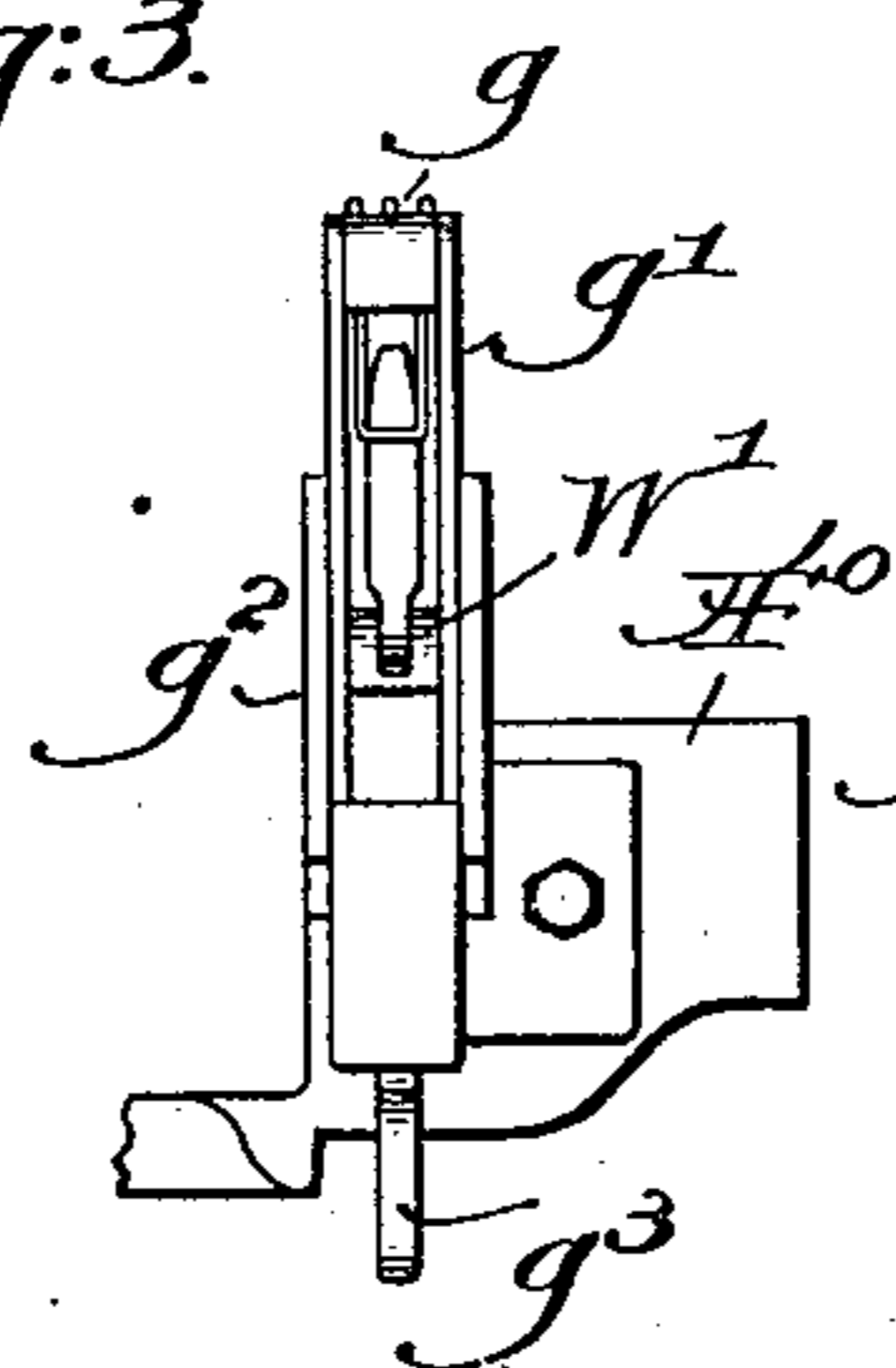
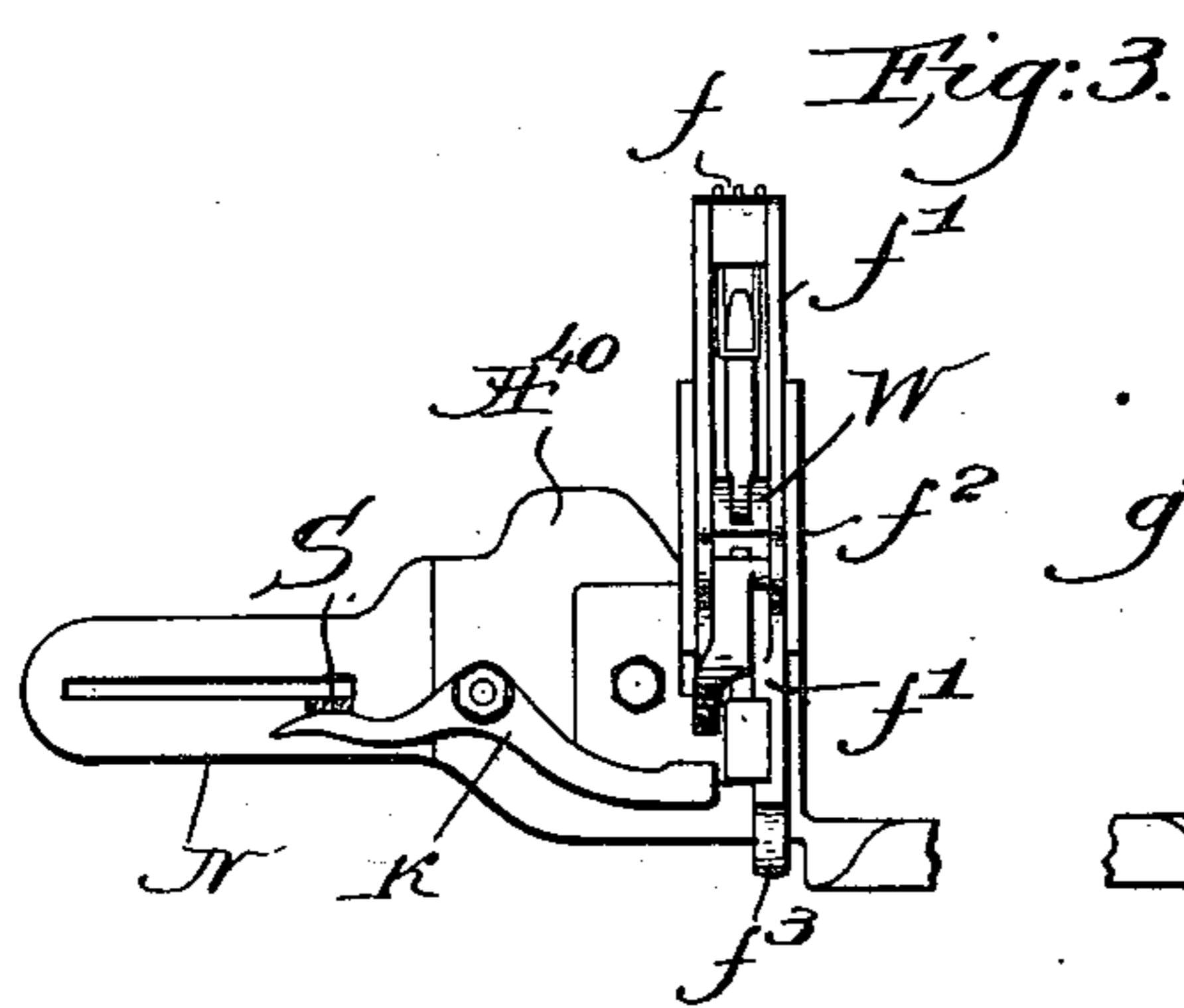
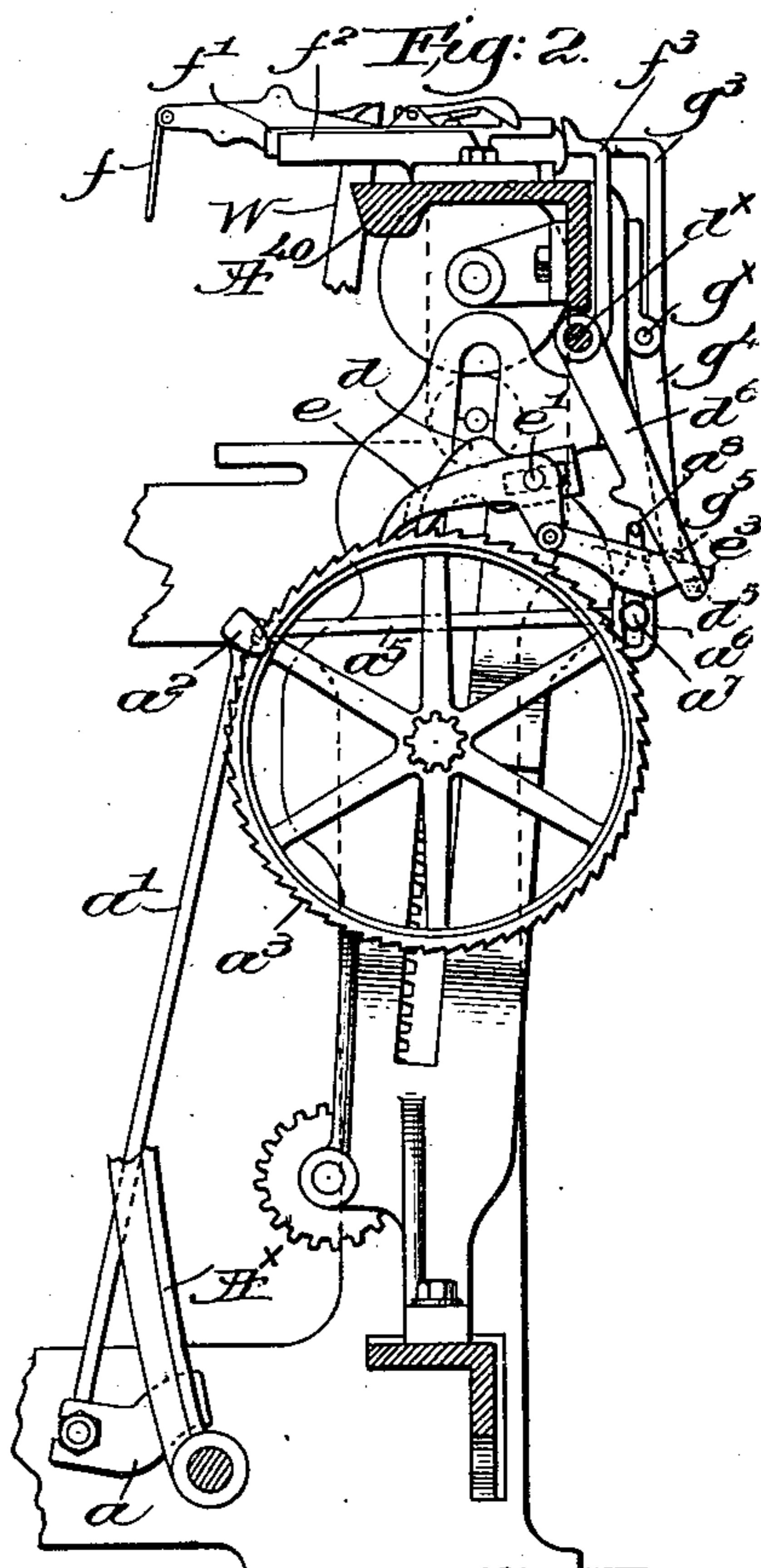
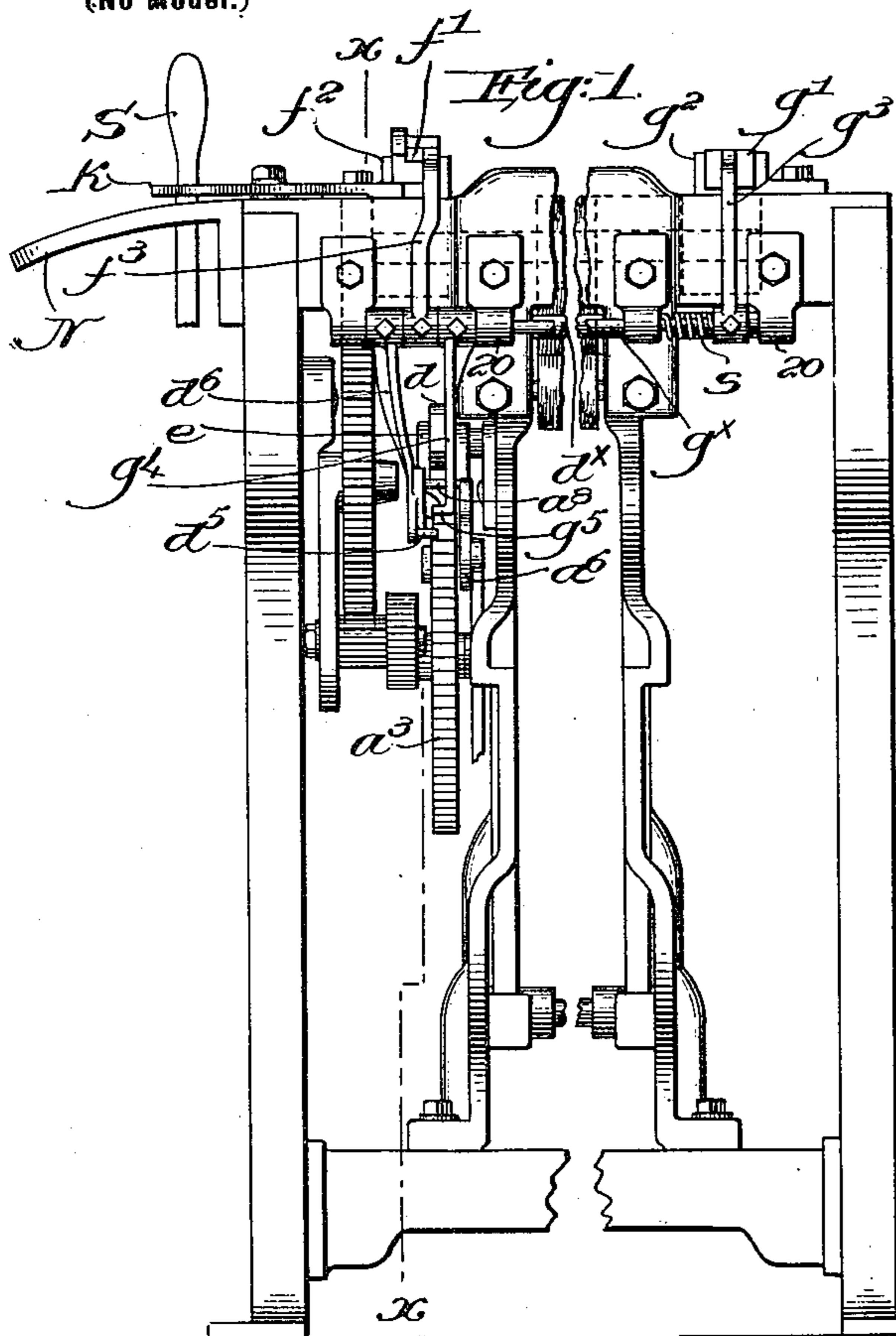


No. 659,628.

C. F. ROPER.
LOOM.

Patented Oct. 9, 1900.

(No Model.)



Witnesses,
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UNITED STATES PATENT OFFICE.

CHARLES F. ROPER, OF HOPEDALE, MASSACHUSETTS, ASSIGNOR TO THE
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LOOM.

SPECIFICATION forming part of Letters Patent No. 659,628, dated October 9, 1900.

Application filed June 7, 1900. Serial No. 19,371. (No model.)

To all whom it may concern:

Be it known that I, CHARLES F. ROPER, a citizen of the United States, residing at Hopedale, county of Worcester, State of Massachusetts, have invented an Improvement in Looms, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

10 This invention relates to looms; and it has for its object the production of novel means for preventing the formation of thin places in the cloth due to the continued action of the take-up after failure of the filling. In the
15 ordinary loom having a single filling detector or fork it will be manifest that if the filling runs out or fails when the shuttle is going in one direction the fork cannot detect its absence until the shuttle has returned, and the
20 take-up will meanwhile be operating and the cloth will be wound up. The let-back device of the take-up mechanism in a measure overcomes this fault; but inasmuch as the empty sheds may vary from part of one to
25 nearly three sheds it is impossible for one mechanism to meet all the conditions. Double forks have been used heretofore to effect the stoppage of the loom by or through either one, and so, too, double filling-changing
30 means have been used, arranged to be operated by two filling-forks. In my present invention, however, I use two filling detectors or forks, arranged to operate in a novel manner and perform a new function. One of the
35 forks is adapted to effect the stoppage of the loom upon detection of filling failure; but the other fork has no connection with or control over the stopping means, it being arranged to cooperate only with the take-up,
40 and its function is to prevent the operation of the take-up, and thereby obviate thin places in the cloth.

Various novel features of my invention will be hereinafter described, and particularly pointed out in the claims.

45 Figure 1 is a front elevation of a portion of a loom, centrally broken out and crowded together to save space, with one embodiment of my invention applied thereto. Fig. 2 is a
50 vertical sectional view on the line *x x*, Fig. 1,

looking toward the right. Fig. 3 is a partial top or plan view of Fig. 1; and Fig. 4 is a detail of a portion of the take-up mechanism viewed from the right side, Fig. 1.

The lay-sword *A^x*, having a bracket *a*, to
55 which the pawl-carrier *a'* is attached, the take-up pawl *a²* to engage the teeth of the ratchet-wheel *a³*, and the controlling-shaft *d^x* are and may be all substantially as in United States Patent No. 601,636, dated Sep-
60 tember 13, 1898, said controlling-shaft forming a part of the means for effecting the operation of filling-changing mechanism if the loom be supplied therewith.

The filling-fork *f*, mounted on a slide *f'*,
65 movable in a guide *f²*, fast on the breast-beam *A⁴⁰*, the weft-hammer *W*, Fig. 2, and the arm *f³*, fast on the rock-shaft *d^x* and upturned in front of the outer end of the slide *f'*, are all of usual construction, the shipper-lever *S*, Figs.
70 1 and 3, being released from its holding-notch in the plate *N* at the proper time by a knock-off lever *k*, pivoted on the breast-beam and actuated by or through the operation of the filling-fork *f* when filling failure is de-
75 tected thereby.

Two let-back pawls *d* and *e* are shown, to operate successively, the pawl *e* being fulcrumed on a fixed stud *e'* on the loom-frame and longitudinally slotted to straddle the
80 shorter pawl *d*, which latter is longitudinally slotted at *d'* to embrace and slide on the stud *e'* when the pawl *e* is disengaged from the ratchet-wheel.

I have herein shown the pawl-carrier *a'* as
85 bent and extended forward at *a⁵*, and at its outer end an upright short arm *a⁶* is adjustably secured thereto by a bolt *a⁷*, entering a slot in the arm, the latter being provided with a lateral extension or pin *a⁸*.
90

The pawl *e* has at its fulcrum end a depending ear *e²*, on which is pivoted a dog *e³*, having a cam-surface *e⁴* on its lower edge adapted to rest on and be at times actuated by a lateral pin *d⁵* on an arm *d⁶*, fast on the
95 rock-shaft *d^x*. Said arm *d⁶* is also provided with a lateral cam-rib *d⁷* on its inner face extended longitudinally of the arm, and the dog *e³* has on its inner face a lateral shoulder
100 *e⁵*, the pin *d⁵* on the arm *d⁶* being located at

the lower end of the cam-rib d^7 . Now when the fork f detects filling failure the slide f' is moved outward to rock the shaft d^x and the arm d^6 thereon is swung inward, the pin d^5 acting on the cam edge e^4 of the dog to lift the latter until the shoulder e^5 is above an offset g^5 , to be referred to, and as the arm d^6 swings inward the cam-rib d^7 engages the projection a^8 of the arm a^6 , thereby moving the pawl-carrier inward and disengaging the actuating-pawl a^2 from the ratchet-wheel, so that the action of the take-up is interrupted, and the stopping mechanism of the loom is also operated by or through the fork f in the manner described. Should the shuttle be going from left to right, however, and the filling fail, the fork f will not detect the absence of filling till the shuttle comes back, and were no means provided to prevent it the take-up would operate during such picks. At the opposite side of the loom accordingly I have provided a second or auxiliary filling-fork g , pivoted on a slide g' , mounted in a stand g^2 on the breast-beam, (see Figs. 1 and 3,) and the outer end of the slide is adapted, when moved outward by a weft-hammer W' , of usual construction, to engage an upturned arm g^3 , fast on an auxiliary rock-shaft g^x , supported in suitable bearings 20, Figs. 1 and 2, and maintained by a spring s in normal position. (Shown in said Figs. 1 and 2.) A depending arm g^4 , fast on the auxiliary rock-shaft near its other end, Fig. 1, has a lateral offset g^5 thereon, and normally the shoulder e^5 of the dog e^3 is in the path of movement of this offset. If now the filling fails while the shuttle is going to the right, Fig. 1, the same is detected by the fork g and the shaft g^x is rocked, swinging the arm g^4 inward, the offset g^5 engaging the shoulder of the dog and pushing the latter inward to thereby swing the pawl e up out of engagement with the ratchet-wheel a^3 , and at the same time the arm g^4 engages the pin a^8 and through the arm a^6 disengages the actuating-pawl a^2 . Thus the action of the take-up is interrupted, and at the same time the disengagement of the pawl e permits the take-up to let back as far as allowed by the slotted pawl d , preventing a thin place in the cloth, while the fork f detects on the return shot of the shuttle and the loom is stopped, or a change of filling is effected if the loom be provided with automatic filling-changing mechanism.

Manifestly the auxiliary fork g has no connection with the stopping mechanism and only operates to prevent operation of the take-up and permit the proper let-back thereof.

When the main fork f operates to detect filling failure, it will be noted that while the take-up is stopped it is not let back, as the latter is unnecessary, and in order to prevent the detecting action of the auxiliary fork on the next shot of the shuttle from operating, as before set forth, to permit let-back the

lifting of the dog e^3 , when engaged by the pin d^5 on the arm d^6 , carries the shoulder e^5 out of the path of the offset g^5 , as described. Let-back of the take-up is consequently only permitted when the auxiliary fork is the first to operate.

By the construction and operation hereinbefore described the formation of thin places in the cloth is prevented no matter in which direction the shuttle is moving when the filling failure is detected.

It is sometimes possible for a broken end of filling to drag out from the shuttle at one side of the loom, raising the fork, so that a thin place will be made; but with the main and auxiliary forks, as herein set forth, this dragging thread would be drawn into the shuttle-box on one side, allowing the auxiliary fork to counteract the evil effect.

In the arrangement herein shown if filling-supplying mechanism be used—such, for instance, as shown in United States Patent No. 529,940—it would be located at one side of the loom and the main filling-fork at the opposite side, with the auxiliary fork at the side adjacent such mechanism, and in such case the main fork would control the operation of the filling-supplying mechanism, the auxiliary fork acting only upon the take-up mechanism.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a loom, stopping means, take-up mechanism, two filling-detectors, and independent connections between them and said mechanism, to arrest the operation of the latter upon detection of filling failure, one of said detectors controlling the operation of the stopping means.

2. In a loom, stopping means, take-up mechanism, two filling-detectors located at opposite sides of the loom, connections between one of said detectors and the stopping means and the take-up mechanism, and independent connections between the other detector and said mechanism.

3. In a loom, take-up mechanism, let-back means therefor, two filling-detectors to detect the absence of filling, and independent connections between said mechanism and the detectors, to arrest the operation of the former upon detection of filling failure, the connections controlled by one of said detectors also effecting the operation of the let-back means.

4. In a loom, take-up mechanism, two filling-detectors to detect the absence of filling, connections between said mechanism and the detectors, to arrest the operation of the former by or through detecting action of either detector, and means to prevent control of the take-up by one of said detectors after its operation has been effected by the other.

5. In a loom, take-up mechanism, including an actuating-pawl, and let-back pawls, a main and an auxiliary filling-detector, to de-

5 tect filling failure, means controlled by detecting operation of the main detector to render the actuating-pawl inoperative upon detection of filling failure, and means controlled by or through the auxiliary detector to render the actuating-pawl inoperative and also to permit the operation of the let-back pawls.

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

CHARLES F. ROPER.

Witnesses:

GEORGE OTIS DRAPER,
ERNEST W. WOOD.