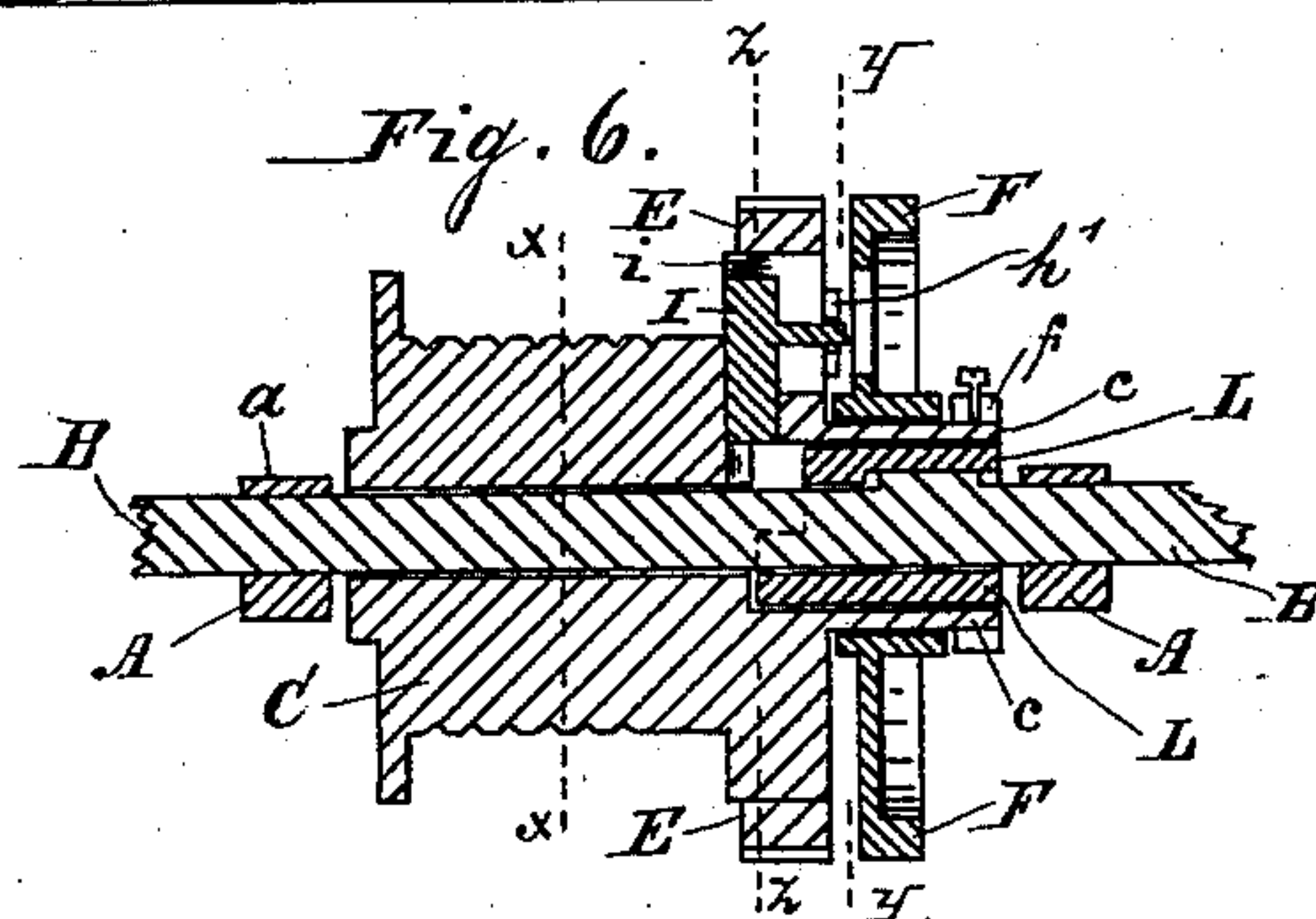
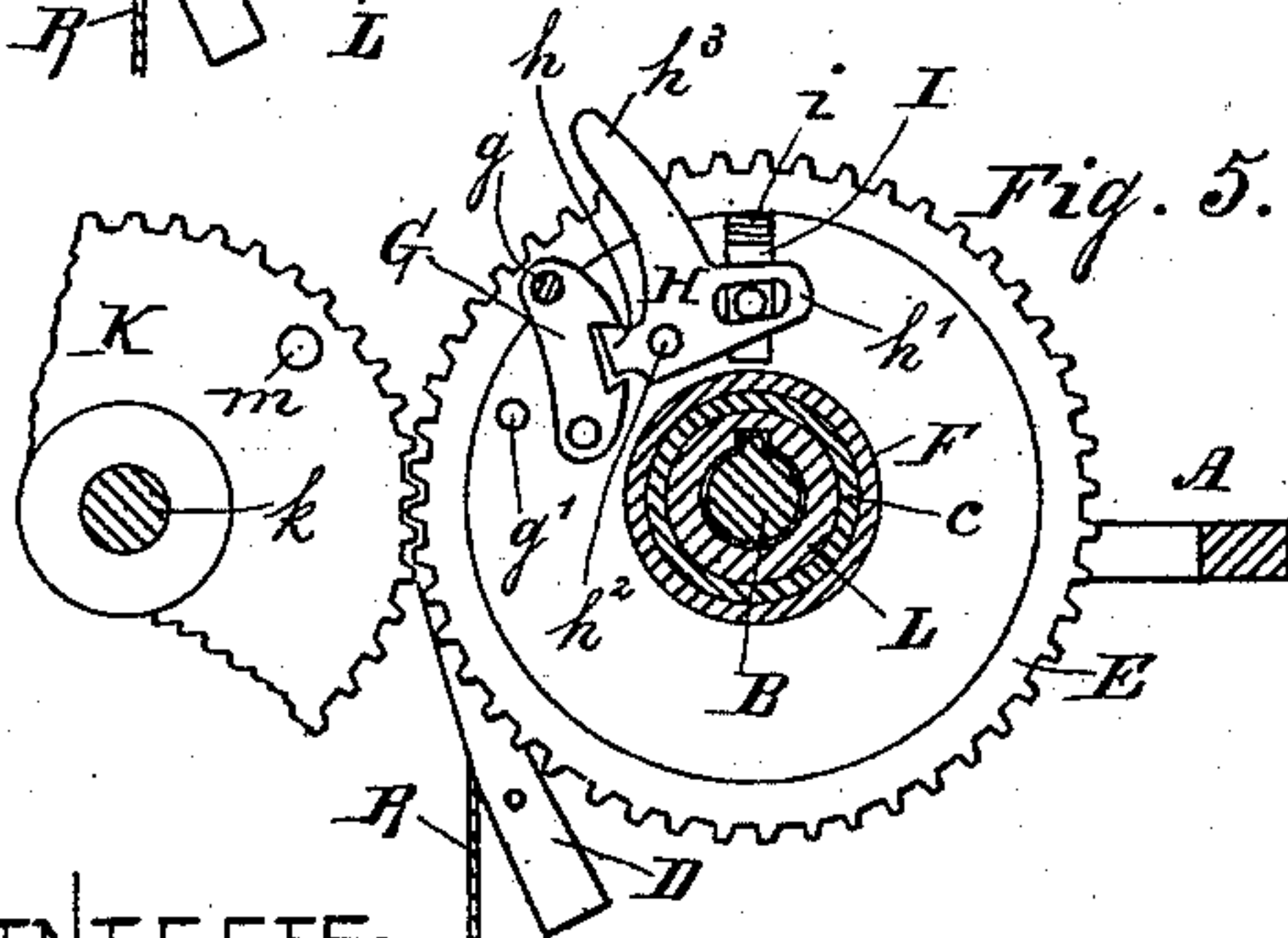
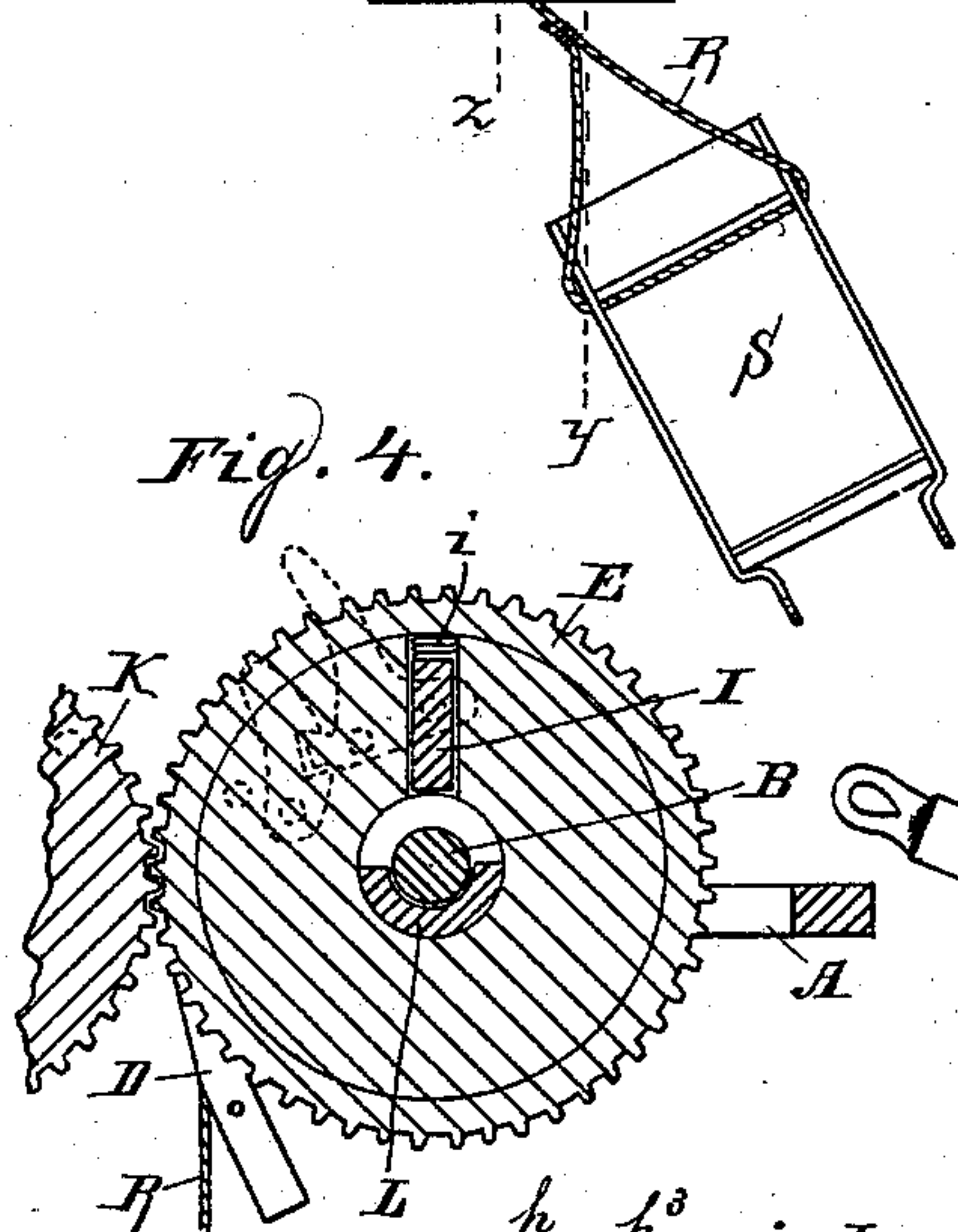
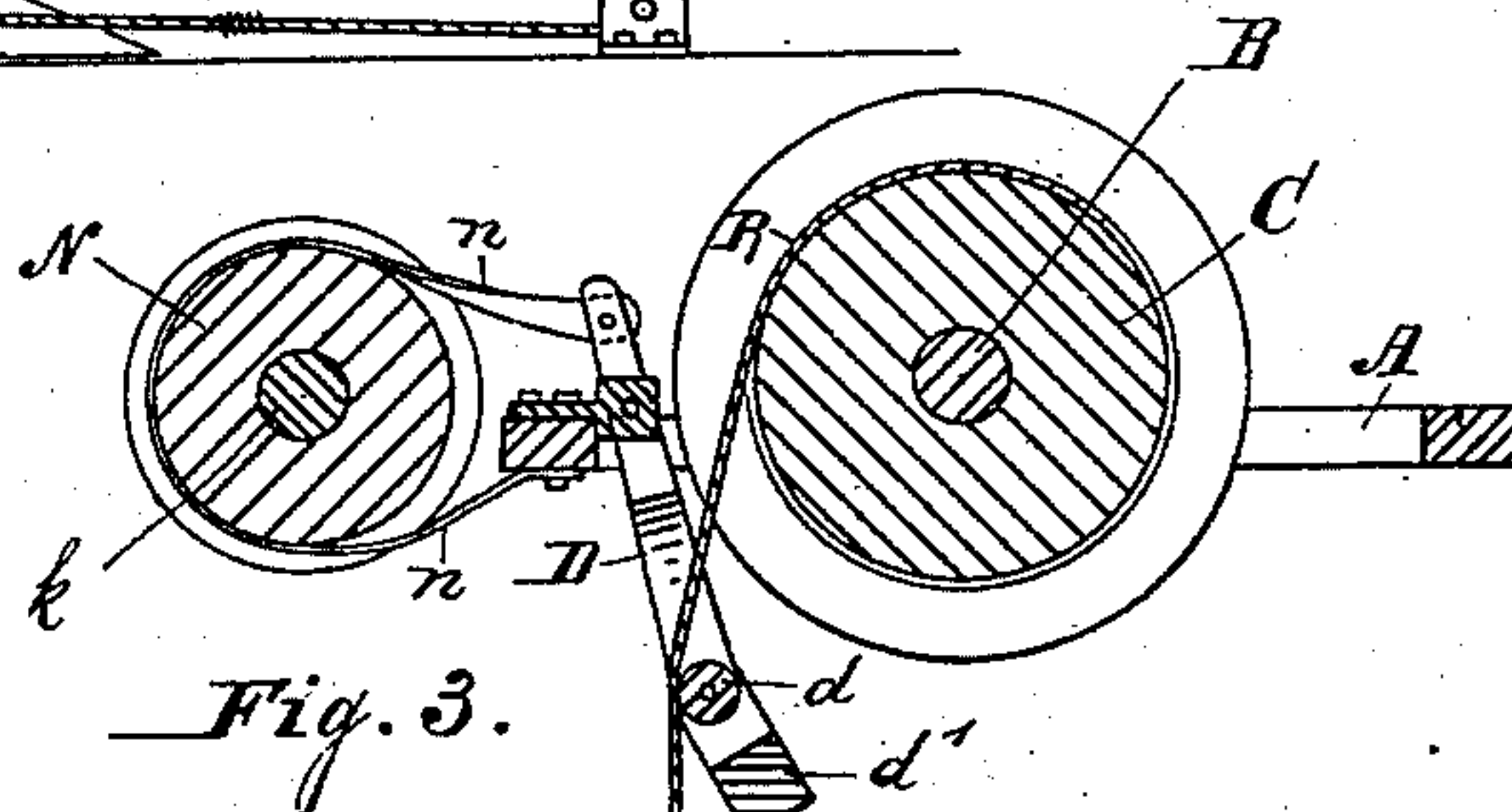
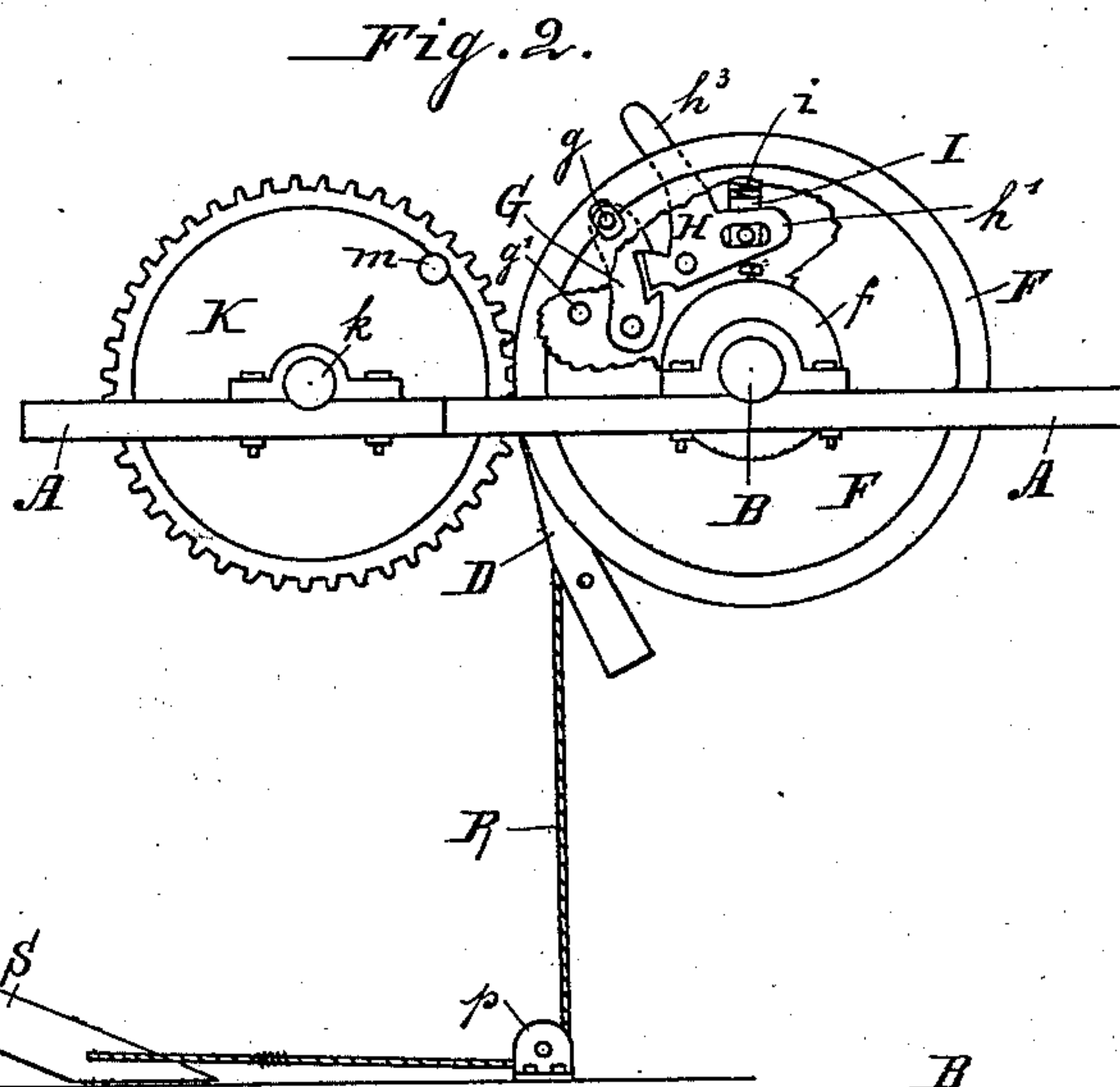


C. J. RINDERKNECHT.
AUTOMATIC SHOVEL MECHANISM.

Patented May 5, 1885.



Theodore Langbein.
A. J. Malone.

INVENTOR =

Charles F. Kinderknecht
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Attorneys.

UNITED STATES PATENT OFFICE.

CHARLES J. RINDERKNECHT, OF INDIANAPOLIS, INDIANA, ASSIGNOR
OF ONE-HALF TO A. J. MALONE, OF SAME PLACE.

AUTOMATIC-SHOVEL MECHANISM.

SPECIFICATION forming part of Letters Patent No. 317,016, dated May 5, 1885.

Application filed December 10, 1884. (No model.)

To all whom it may concern:

Be it known that I, CHARLES J. RINDERKNECHT, a citizen of the United States, residing in Indianapolis, in the county of Marion and State of Indiana, have invented certain new and useful Improvements in Automatic-Shovel Mechanism, of which the following is a specification.

My invention relates to mechanism which automatically operates the shovels or scoops used to unload grain, coal, sand, &c., in bulk from cars, or to move it from one place to another place; and the objects of my invention are to provide a shovel apparatus more simple and strong in construction than the ones heretofore in use. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a top view or plan of my improved shovel apparatus; Fig. 2, a side view of the same; Fig. 3, a vertical cross-section through the same on line *xx* on Figs. 1 and 6; Fig. 4, a vertical cross-section on line *zz*; Fig. 5, a vertical cross-section on line *yy*, and Fig. 6 a longitudinal vertical section on line *ww*.

Similar letters refer to similar parts throughout the several views.

In the drawings I show the mechanism for but one shovel attached to the main shafting, while in actual use at least two shovels are employed.

A A is the frame-work which supports the machine, said frame-work being held up in place by posts, beams, or hangers, as are found best suited for the location.

On the frame-work A A rests and revolves in its bearings *a a* the main shaft B. Loosely mounted on said shaft B is the drum C, to which is fastened and on which winds and unwinds the rope R. Said rope R passes from the drum C downward through the brake-lever D, around a guide-pulley, *p*, secured to the floor right under the brake-lever D, and is fastened to the shovel or scoop S. The drum C has a screw-threaded surface, the threads forming guides and runs for the rope R to lie in.

Rigidly secured to one end flange of the drum C is the cog-wheel E; or the cogs may

be secured to or worked directly into the flange of the drum C.

Mounted loosely on the drum-sleeve *c* is the fly-wheel F, which is prevented from slipping off from said sleeve *c* by the band or collar *f*, secured over the sleeve *c* at its outer end. This fly-wheel F, while it is loosely mounted on the sleeve *c*, is forced to revolve with the cog-wheel E and the drum C by the following mechanism.

Pivoted to the side of the cog-wheel E or the drum C is the notched plate G, from one end of which projects a pin, *g*, that extends into a slot in the fly-wheel F, thus interlocking the fly-wheel F with the cog-wheel E.

g' is a stop secured to the wheel E to prevent the notched plate G from dropping out of reach from the pawl-plate H. Also pivoted to the side of the cog-wheel E is the pawl and lever plate H, the arm *h* of which, at one side of its fulcrum-point *h'*, engages into a notch in the plate G, while the arm *h'* at the other side of the fulcrum-point *h'* operates a pin, I, which slides up and down in a slot cut in the cog-wheel E, radiating from its point of contact with the main shaft B to near its perimeter. The pin I is pressed down onto the main shaft B, when the parts G and H are not engaged, by the spring *i*.

In the drawings, the pawl and lever plate H is shown locked into the notched plate G, whereby the pin I is raised out of contact with the clutch-sleeve L, and the drum C is allowed to revolve in the opposite direction from the main shaft B.

Slipped over the main shaft B and keyed to the same is the clutch-sleeve L, over which extends and around which rotates the drum-sleeve *c*, that already has been described in the foregoing. The object of this sleeve L is to transmit the motion of the main shaft B at its proper time to the drum C, and it is accomplished by a notch being cut out of the inner end of the sleeve L, into which the pin I, that operates and is connected with the cog-wheel E and the drum C, drops when the parts H and G are disengaged. The cog-wheel E operates the cog-wheel K, secured to the shaft *k*, and supported by the frame-work A A. Keyed to the shaft *k* is also the brake-wheel

N, which is located to face the drum C. The brake belt or chain *n* is firmly fastened at one end to the frame-work A, and, after passing around the brake-wheel N, connects with the upper arm of the brake-lever D. Said brake-lever D has its fulcrum-point near its center on the frame A, and is provided with a roller, *d*, and a weight, *d'*, at its lower arm. The rope R, passing from the drum C down in front of the roller *d*, pushes, when stretched tight, the lower end of the lever D backward, thus throwing the upper arm forward and slackening the brake-belt *n*.

The apparatus is to be set up and adjusted, in order to operate satisfactorily, in the following manner: As much rope as will be needed, if unwound, to reach the most remote corners of the loaded car or the store-room from which the bulk is to be removed must be wound upon the drum C, and then the shovel S must be fastened to the end of the rope R at the place where the bulk is to be dumped or unloaded. The teeth of the small cog-wheel K are then to be engaged with the teeth of the large cog-wheel E in such a manner and at such a point that the projecting pin *m* on the small wheel K rests directly upon the finger *h*³ of the pawl-plate H, connected with the large wheel E; or, in other words, that as soon as the shovel S, by the winding up of the rope R onto the drum C, is brought to the dumping or unloading place the clutching mechanism G H I, by the stroke of the finger *h*³ against the pin *m*, is disengaged with the clutch-sleeve L and the main shafting B, thus allowing the main shafting to rotate and the shovel to stop. The diameter of the cog-wheel E must be so much larger than the one of the cog-wheel K, or the cog-wheel E must have so many more teeth than the wheel K, that the finger *h*³ on the wheel E will only strike the pin *m* on the wheel K when the shovel S reaches the unloading place, and not while it is traveling to this place, may the distance be a long or short one.

These conditions being fulfilled, the device operates as follows: The scoop or shovel S being at the unloading place, the main shaft B revolves, while the drum C and the wheels E, K, and F are idle. The operator, taking hold of the shovel S, pulls the same back toward the desired place. The rope R unwinds from the drum C, the drum C, the cog-wheel E, and the fly-wheel F revolving in the opposite direction of the main shaft B. As soon as the operator stops, the drum C and the cog-wheel E cease to revolve, while the momentum of the fly-wheel F, which is loosely mounted upon the drum-sleeve *c*, acts, and, by throwing forward the pin *g*, that projects from the plate G into a slot in the fly-wheel F, releases the pawl-lever H, which allows the pin I to drop into the clutch-sleeve L, thus transmitting the motion of the main shaft to the drum C. The rope R is wound on the drum until the shovel reaches the unloading-point, when the

finger *h*³ will strike against the pin *m* and re-engage the pawl-lever H with the notched plate G, thus lifting the pin I and disconnecting the main shafting and cog-wheel E and the drum C. The operation is then repeated, the device working the same, it making no difference where the operator stops and the shovel takes up its load. As soon as the operator stops and drops the shovel into the grain, sand, or whatever it may be, the rope R slackens and the brake-belt *n* tightens around the brake-wheel N. This stops the revolution of the cog-wheels K and E and the drum C. Hereby the force of the meeting of the dropping-pin I and the end of the clutch-sleeve L is reduced, thus lessening the liability of breakage. The revolution of the drum C being stopped suddenly by the brake device N n D, as soon as the operator drops the shovel S in place, further allows the fly-wheel F to always act promptly and perfectly in throwing the clutch-pin I into the clutch-sleeve L, thus avoiding any failure of the clutching device.

What I claim, and desire to secure by Letters Patent, is—

1. In an automatic-shovel mechanism, the combination, with the main shaft B, the supporting frame-work A A, the rope R, and the scoop S, of the drum C, loosely mounted on the shaft B, the drum-sleeve *c*, the clutch-sleeve L, slipped over and keyed to the main shaft B between said shaft B and the drum-sleeve *c*, the fly-wheel F, mounted loosely on the drum-sleeve *c*, the collar *f*, secured to the end of the sleeve *c* for the purpose of preventing the fly-wheel F from slipping off from said sleeve *c*, the clutching device G, H, and I, constructed as described, and forming means for transmitting the motion of the main shaft B to the drum C, all arranged as described, and for the purpose specified.

2. In an automatic-shovel mechanism, the combination, with the shafting B, the supporting frame-work A A, the rope R, and the scoop S, of the drum C, being provided with a sleeve, *c*, the cog-wheel E, secured to or forming part of one of the flanges of the drum C, the fly-wheel F, loosely mounted on but prevented from slipping off from the drum-sleeve *c*, the clutch-sleeve L, keyed to the shaft B between said shaft B and the drum-sleeve *c*, as described, the clutching device G H I, constructed as described, and the cog-wheel K, mounted on the shaft *k* and provided with the projecting pin *m*, said pin *m* and the clutching device G H I forming means for breaking the connection between the drum C and the main shaft B, and for reversing the motion of the drum C, all constructed as described, and for the purpose specified.

3. In an automatic-shovel mechanism, the main shaft B, the supporting frame-work A A, the rope R, guide-pulley *p*, and the scoop S, in combination with the drum C, provided with screw-threads on its surface to receive

the rope R, the drum-sleeve *c*, the cog-wheel E, secured firmly to the drum C, the fly-wheel F, mounted loosely on the drum-sleeve *c*, the clutch-sleeve L, keyed to the shaft B between
5 said shaft B and the drum-sleeve *c*, the cog-wheel K, mounted on the shaft *k*, the clutching device G H I, constructed as described, and the striker *m* on the cog-wheel K, forming
10 means for engaging and disengaging the main shaft B with the drum C, and the brake mechanism N *n* D *d* *d'*, all substantially arranged as described, and for the purpose specified.

4. In an automatic clutching device, the combination, with a main shaft, B, and a sup-
15 porting-frame, A A, of a drum, C, provided with a drum-sleeve, *c*, a cog-wheel, E, firmly secured to the drum C, a fly-wheel, F, loosely mounted on the drum-sleeve *c*, a clutch-sleeve, L, keyed to the main shaft B inside of the drum-
20 sleeve *c*, a pin, I, operating in a slot cut in

the cog-wheel E, radiating from its center, a pawl-lever, H, pivoted to the cog-wheel E and provided with a pawl proper, *h*, an arm, *h'*, connected with the sliding pin I and a finger, *h*³, a spring, *i*, operating on the sliding
25 pin I, a notched plate, G, also pivoted to the wheel E and provided with a projecting pin, *g*, extending into a slot in the fly-wheel F, and a cog-wheel, K, provided with a pin, *m*, placed
30 to engage at the proper time with the finger *h*³, all arranged as described, and for the purpose specified.

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

CHAS. J. RINDERKNECHT.

Witnesses:

THEODORE LANGBEIN,
A. J. MALONE.