

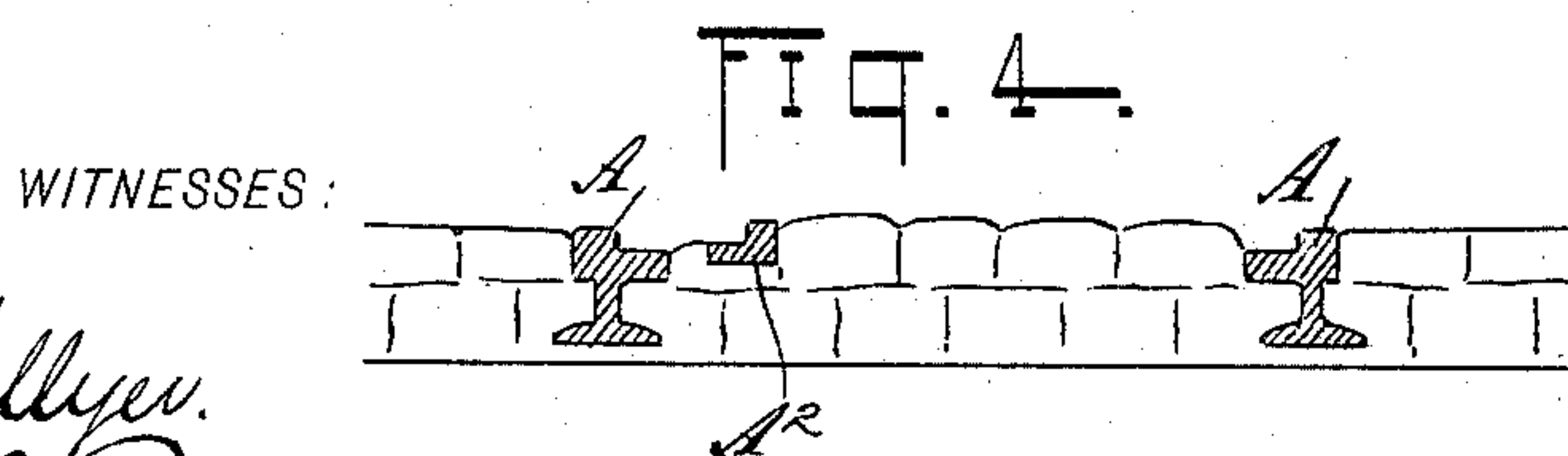
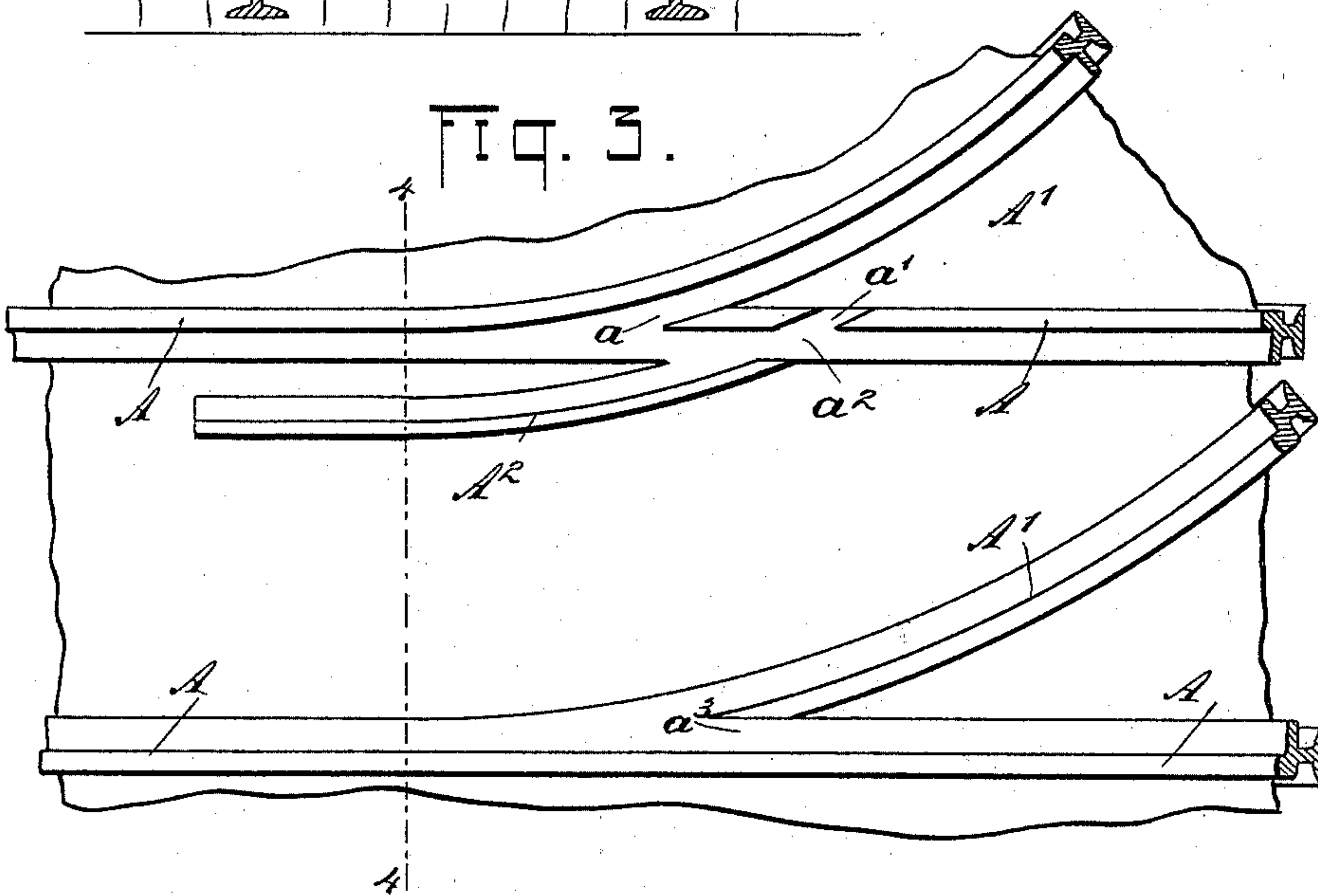
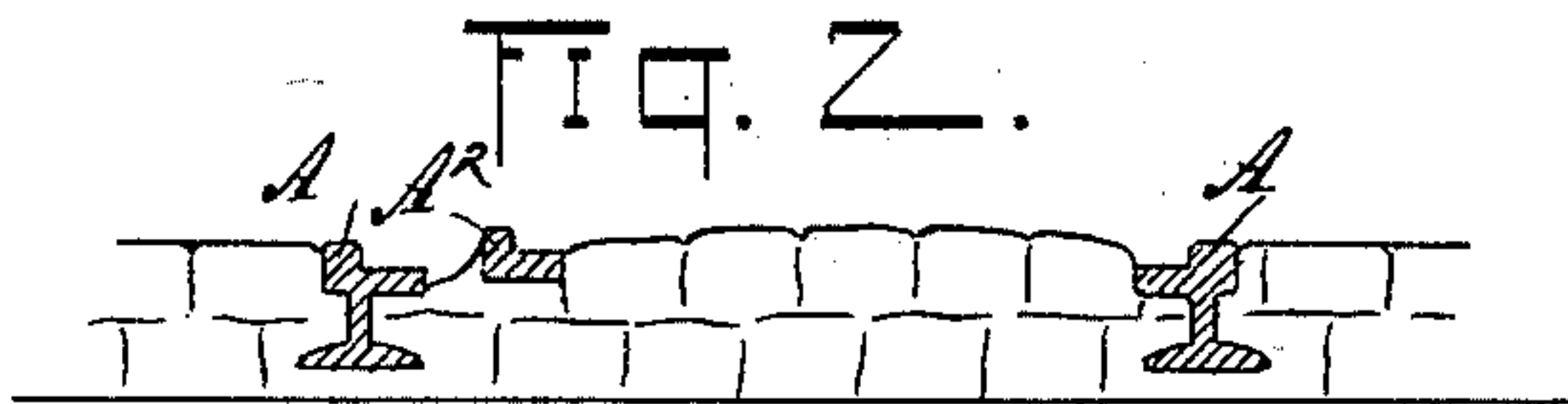
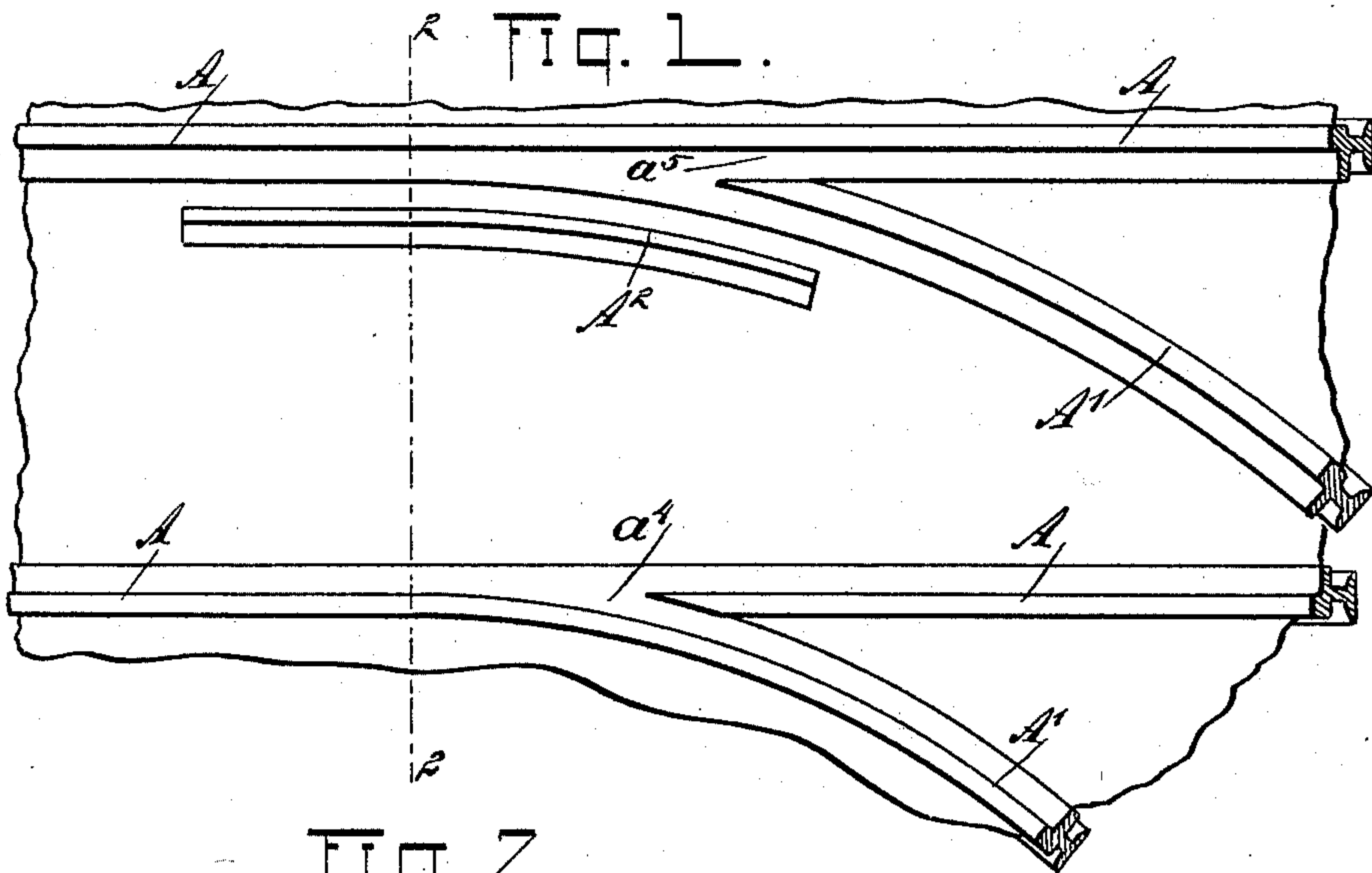
(No Model.)

4 Sheets—Sheet 1.

W. & W. J. HARRIS.
RAILWAY SWITCH.

No. 603,902.

Patented May 10, 1898.



H. Kelly.
H. L. Reynolds.

INVENTORS:
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ATTORNEYS.

(No Model.)

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FIG. 5.

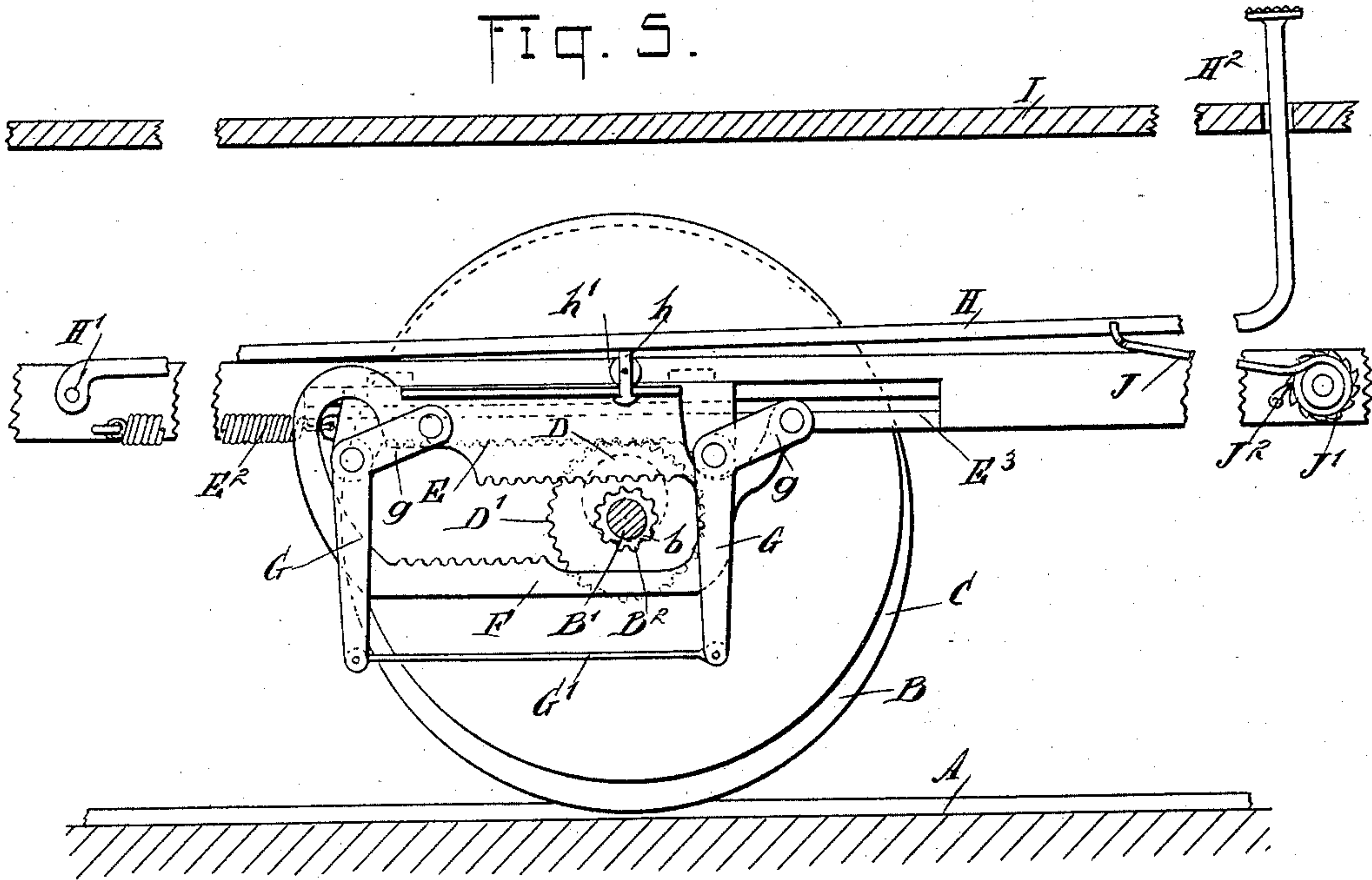
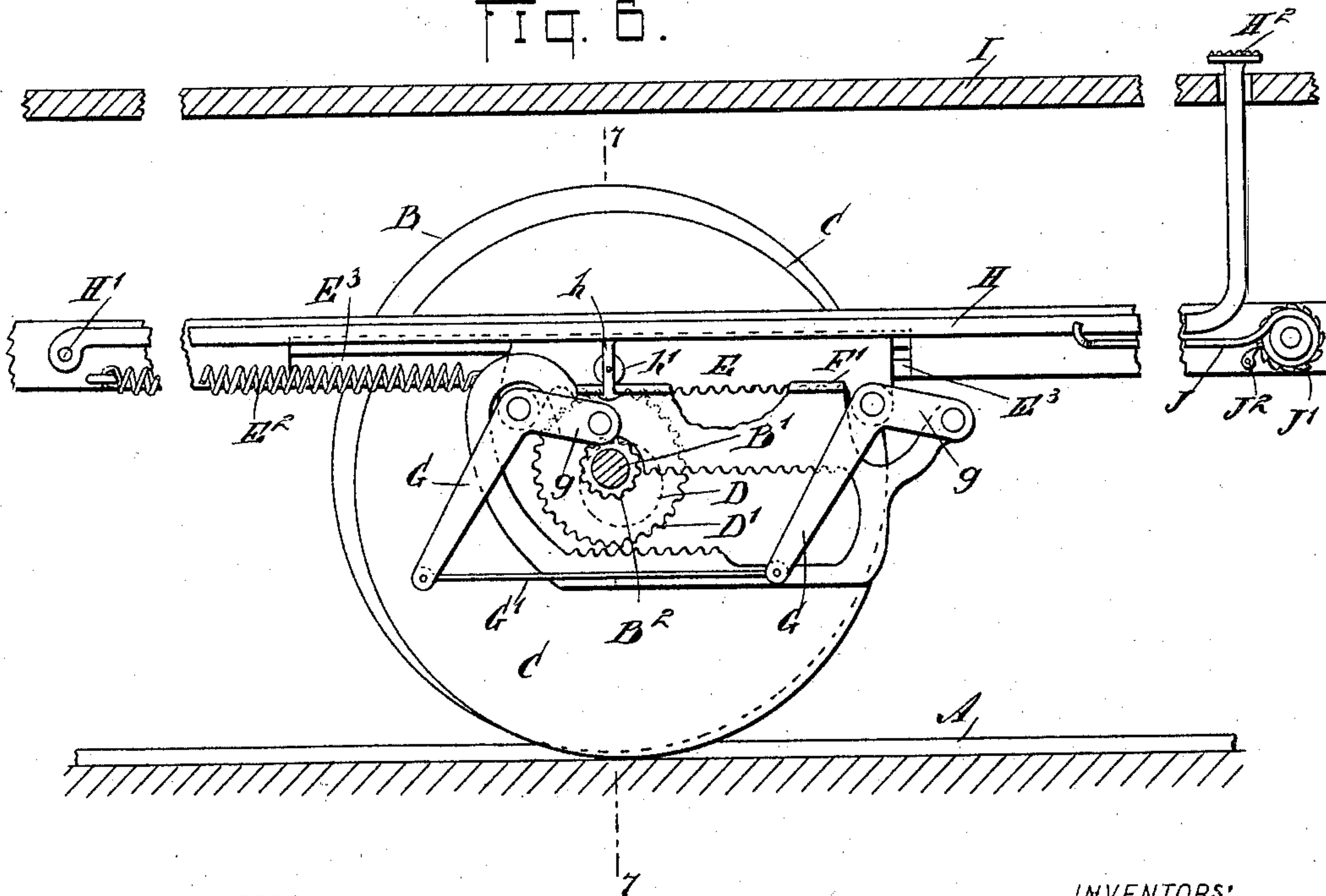


FIG. 6.



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FIG. 7.

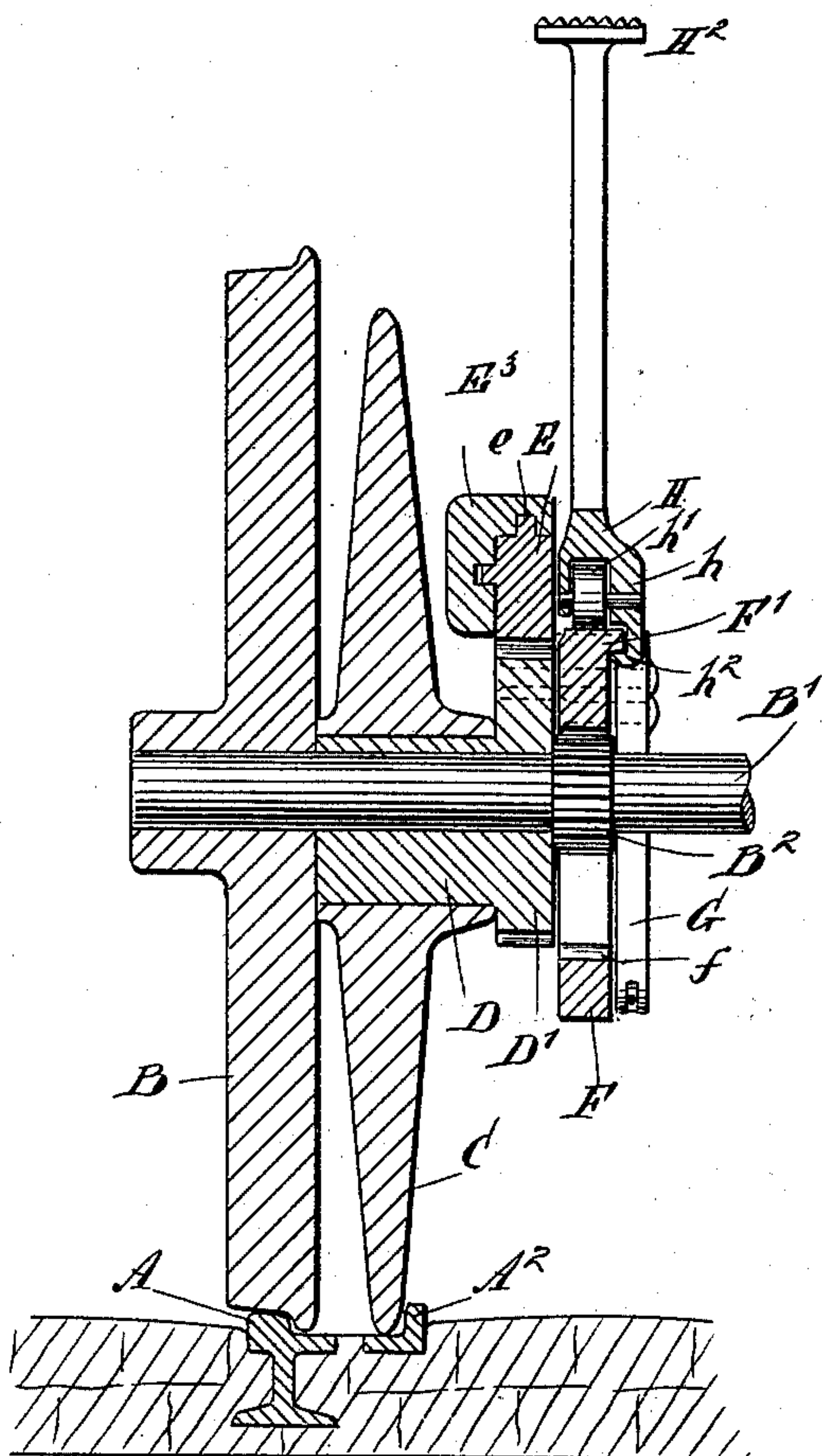


FIG. 8.

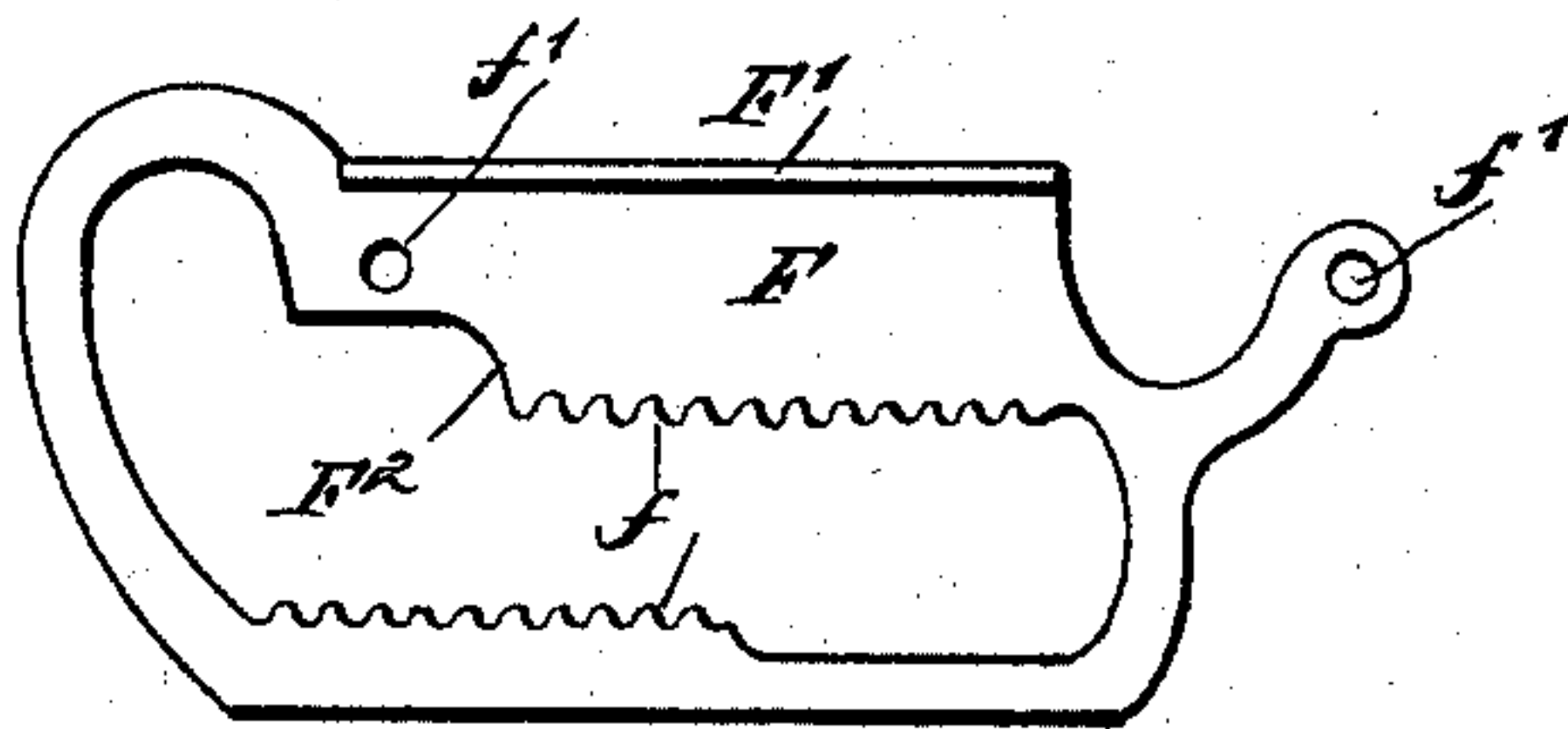


FIG. 9.

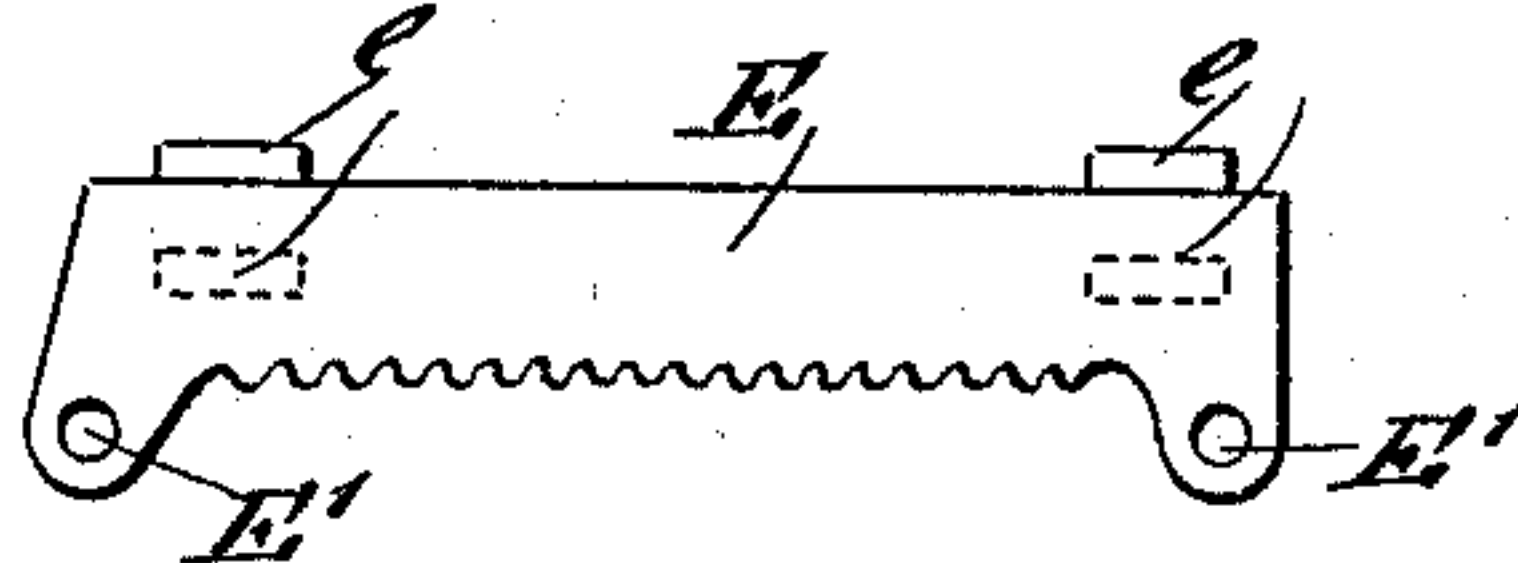


FIG. 10.

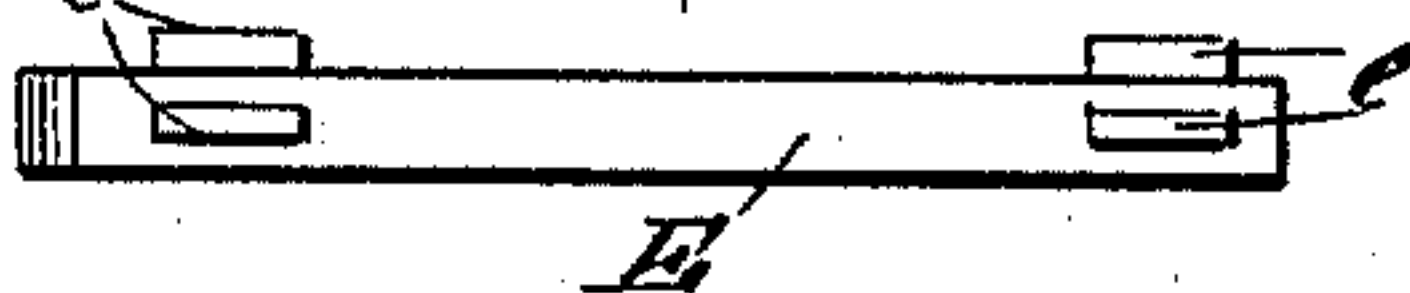


FIG. 11.



FIG. 12.



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FIG. 13.

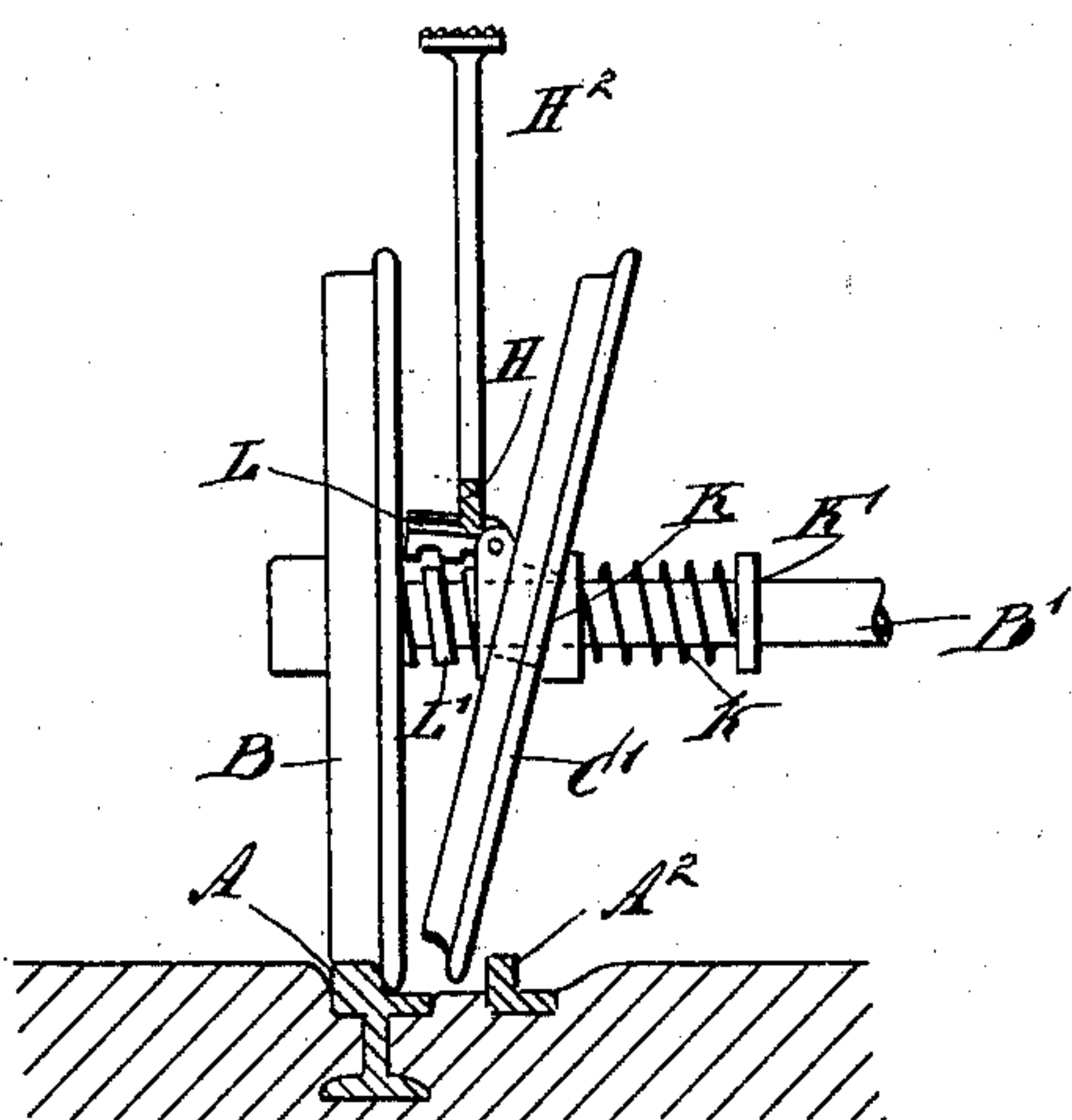
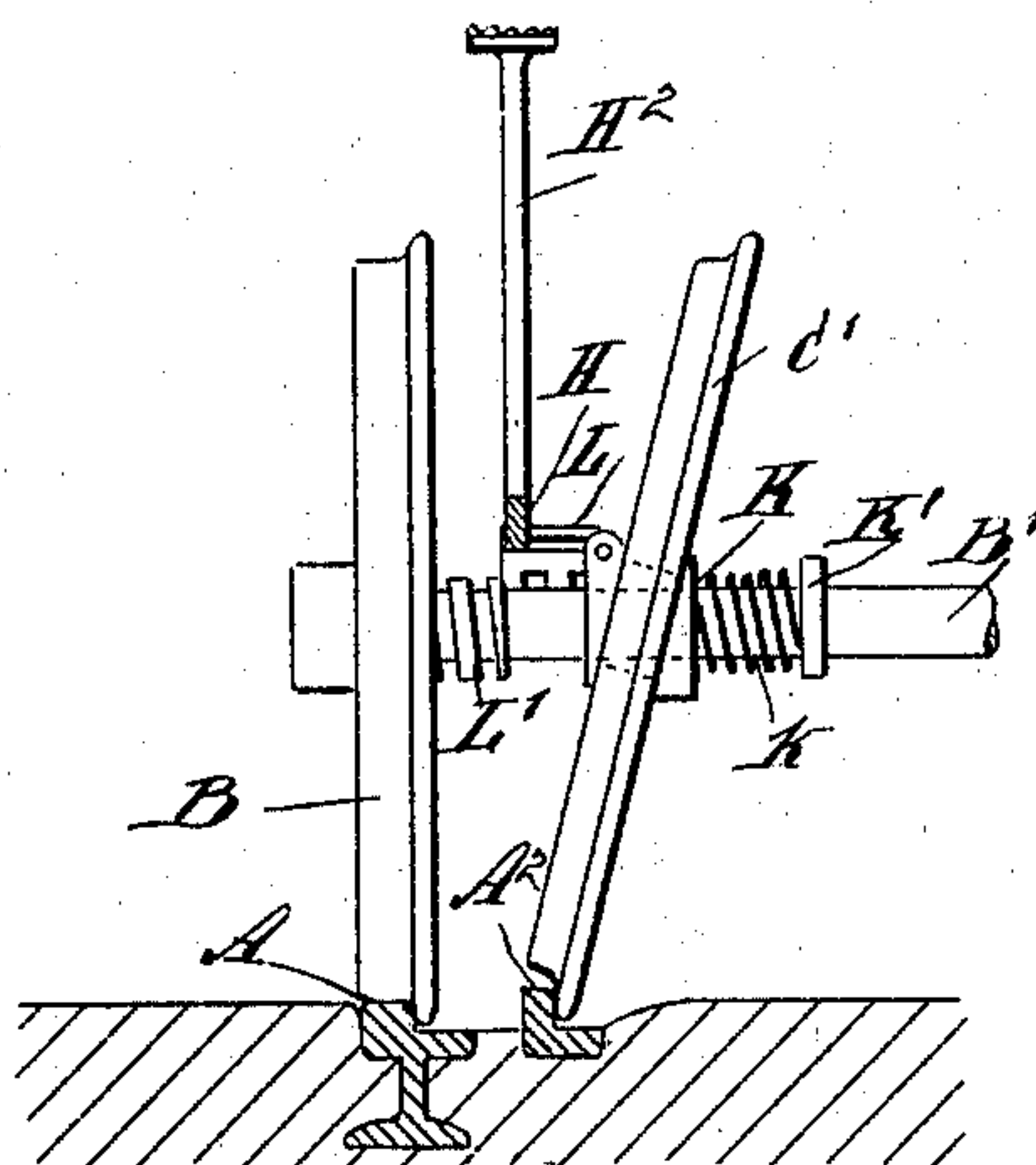


FIG. 14.



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UNITED STATES PATENT OFFICE.

WILLIAM HARRIS, OF BELLEBRIDGE, PENNSYLVANIA, AND WILBUR J. HARRIS, OF MOUNT PLEASANT, OHIO.

RAILWAY-SWITCH.

SPECIFICATION forming part of Letters Patent No. 603,902, dated May 10, 1898.

Application filed July 28, 1897. Serial No. 646,221. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM HARRIS, of Bellebridge, in the county of Allegheny and State of Pennsylvania, and WILBUR J. HARRIS, of Mount Pleasant, in the county of Jefferson and State of Ohio, have invented a new and Improved Railway-Switch, of which the following is a full, clear, and exact description.

Our invention relates to certain improvements in railway-switches by which the switch-points are made entirely fixed or without any movable parts, and the car itself is provided with a movable member which may be made to engage a deflecting-rail, forming a part of the switch-points, to throw the car upon the desired track.

Our invention consists of certain improvements in the rails forming the switch-points and also in certain mechanism attached to the car and coöperating therewith, all of which will be hereinafter described, and particularly pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a plan view, and Fig. 2 a cross-sectional elevation on the line 2 2 of Fig. 1, of one method of constructing the switch-points. Fig. 3 is a plan view, and Fig. 4 is a cross-sectional elevation on the line 4 4 of Fig. 2, showing another method of constructing the switch-points, the two constructions being similar, excepting that the switches turn in opposite directions, but the deflecting-wheel attached to the car is upon the same side in both cases. Figs. 5 and 6 are side elevations of the mechanism mounted upon the car for operating the switch, two positions of such mechanism being shown in said figures. Fig. 7 is a cross-sectional elevation on the line 7 7 in Fig. 6, showing the switch-operating mechanism. Fig. 8 is a detail elevation of one of the racks used for actuating the switch-operating devices. Figs. 9 and 10 are a detail elevation and a plan view of the other rack used in the operation. Figs. 11 and 12 are details of the levers connecting the two racks. Figs. 13 and 14 are elevations showing a slightly-

modified form of construction of the device for operating the switch.

One of the objects sought to be obtained by our device is the doing away with all movable parts of the switch-points and placing mechanism upon the car and under the control of the motorman by which the car may be switched to any track desired.

The construction of the switch-points is clearly shown in Figs. 1 to 4, inclusive. In these figures, A represents the rails of the straight or through track, and A' the rails of the switch or diverging track. These tracks are constructed so as to form either a part of the same piece or are secured to a foundation in such a way that they will be held firmly in a fixed position. At the point where the switch-track or the diverging rails separate from the rails of the main track a notch is formed through the tread-surface of the rail to accommodate the flange of the wheel. These notches are represented by a a' a^2 a^3 in Fig. 3 and a^4 and a^5 in Fig. 1. The notch a' accommodates the flange of the wheel when the car is turned upon the diverging track or rails A'. The notches a^3 , a^4 , and a^5 are also similar to this and to the notches usually made for such purpose.

Parallel to one of the diverging rails is placed a deflecting or auxiliary rail A², which extends a short distance each side of the switch-point and a sufficient distance in the direction of the diverging rail to reach entirely beyond the notch a^4 or a^3 . Its function is to furnish a surface for the engagement of the movable wheel mounted upon the car, by which said rail will be enabled to move the car to one side sufficiently to engage the flanges of the track-wheels with the diverging rails A'.

In Figs. 5, 6, and 7 one form of the operating mechanism for the switch is shown. In these figures the car-axle is represented by B' and the wheel by B. Upon the car-axle near the wheel B is mounted a cylinder or disk D. The aperture through this cylinder or disk which receives the axle is placed eccentrically, so that the wheel C, which is mounted on the disk, may be raised or lowered by rotating the cylinder or disk D.

To the inner end of the cylinder or disk D is fixed a gear-wheel D', which is constantly in mesh with the teeth upon the rack E, mounted to slide in a block or guide E³, fixed to the frame of the car. The rack E is secured to the guide E³ by means of flanges e, which fit within corresponding grooves in the guide. To one end of the rack E is attached a spring E², which has its other end fixed to the frame of the car. This spring tends to draw the rack back at one end of its stroke, which position is the one which will carry the wheel C in its upper position or that shown in Fig. 5.

A second rack F is attached to the rack E by means of the levers G. The arms g of these levers form links which are pivoted at one end to the pins E' of the rack E and at the other end at the points f' on the rack F. This connection will permit the rack F to have an oscillating motion vertically, but will cause the two racks to move together in a horizontal direction. The lower arms of the levers G are connected by a link G', so that they will move in unison and so that the rack F will be maintained parallel to the rack E—that is, in a horizontal position. The rack F is provided with two sets of teeth f, located upon opposite sides of an opening in the rack, which opening embraces the car-axle and also a pinion B², mounted upon said axle. The distance between the two sets of teeth f is sufficient to permit the pinion B² to operate upon one set of teeth f without engaging the other.

The opening in the rack F, within which the pinion B² works, is provided with a notch or shoulder F², adapted in one position of the mechanism to engage with the outer surfaces of the teeth of the pinion B², and thus to lock the rack in a fixed position. The upper set of teeth f are engaged by the pinion B² when the wheel C is to be depressed. The mechanism will be returned to normal position partially or wholly by the spring E²; but to provide a positive return for the mechanism the lower set of teeth f are provided upon the rack F. When the rack F is raised upon the raising of the lever H, hereinafter described, the lower set of teeth f will engage the under side of the pinion B², and the rack will be positively returned to its normal position. The upper side of the rack F is provided with a laterally-extending flange F', by which it is supported.

An operating-lever H is pivoted at one end at H' to the frame of the car and at its opposite end is bent so as to extend vertically through the floor I of the car and is provided with a foot piece or plate H², by which it may be operated by the feet of the motorman. The body of this lever H extends horizontally when in its lower position. Immediately over the car-axle the lever H is provided with a depending arm h, to which is pivoted a roller h', adapted to engage the upper surface of the rack F. The lower end of the arm h is bent under, as shown at h², forming

a hook adapted to engage the under surface of the flange F', and thus to lift the rack F. The outer or movable end of the lever H is raised by means of a spring J, which at one end engages the lever and at the other end is coiled about the spindle of a ratchet-wheel J', which latter is held in any position set by the pawl J².

The deflecting-wheel C is made slightly smaller than the track-wheel B, so that when in its lowermost position it will engage the flange of the deflecting-rail A² and thus move the car sidewise.

The operation of the mechanism described is as follows: When the lever H is depressed by pressure applied to the foot-piece H², the rack F is depressed until the upper set of teeth f engage the teeth of the pinion B². This pinion being attached to the car-axle will cause the rack F to be moved horizontally until the pinion B² reaches the notch F², when the rack will drop so that the pinion will hold the rack in this position. As the rack F is moved forward it carries with it, through the connection of the levers G, the rack E. This rack being in engagement with the gear-wheel D' rotates the eccentric cylinder or disk D. The amount of this rotation is a half-turn, which lowers the wheel C to its lowermost position. The depression of the wheel C is caused just before the car reaches the switch. The wheel C therefore engages the deflecting-rail A² and causes the car to be moved to one side a sufficient distance so that the flanges of the car-wheels B will engage the portion of the switch-rails A' beyond the notches formed between them and the main track. From this point the car-wheels being thus started upon the diverging line will continue thereon.

In Fig. 1 the construction is that which would be required when the deflecting-wheel C is mounted upon that side of the car which is upon the outer or convex side of the curve, and the construction shown in Fig. 3 is that which would be required when the deflecting-wheel is mounted upon the inner or concave side of the curve. Other than this the constructions are the same.

In Figs. 13 and 14 a modified form of operating mechanism is shown. In this instance the deflecting-wheel C' is mounted upon a cylinder K, mounted at an angle upon the axle B'—that is, the axis of the cylinder K forms an angle with the axis of the axle B', the same being preferably both in a vertical plane. Upon the car-axle is fixed or formed a short section of a screw-thread L'. The cylinder K is held toward this screw-thread by means of a spirally-coiled spring k, surrounding the axle and connecting at its other end with a collar K', mounted upon the axle. Upon the end of the cylinder K next to the screw-thread is pivoted a block L, which is threaded so that it may engage the screw-thread L', and thus move the cylinder K upon the axle. This block L is connected to and

operated by the lever H, which in all essential parts is similar to that previously described. With this construction the engagement of the deflecting-wheel C' with the deflecting-rail A² is caused by moving the wheel horizontally on the axle B', so as to bring it into the proper line for engagement with the deflecting-rail A².

In all of these constructions the essential principle is the same—namely, that a deflecting-rail be used which is engaged by a wheel mounted upon the car and movable, so as to engage the deflecting-rail or clear it, as desired. This construction enables a switch to have all points fixed and is consequently one which cannot become frozen or otherwise blocked, so as to become inoperative. It also places the switching of the car thoroughly and conveniently under the control of the motorman and makes it unnecessary to stop the car to throw the switch or to set any mechanism by which the switch may be thrown, the entire operation being caused by the depression of a lever.

Having thus described our invention, we claim as new and desire to secure by Letters Patent—

1. The combination with switch-points, the parts of which are immovable and which comprise an auxiliary deflecting-rail alongside the track-rail, of a wheel mounted to turn upon an eccentrically-journaled shaft mounted on the car, and means for rotating said shaft to raise or depress the wheel, said wheel when in its lower position engaging the deflecting-rail to move the car sidewise, and in its upper position passing over the rails, substantially as described.

2. A car-switching device, comprising an auxiliary deflecting-rail alongside of the track-rails, a disk or cylinder eccentrically journaled on the car, a wheel journaled on the disk or cylinder, and adapted when depressed, to engage the deflecting-rail, means connected to the eccentric disk to rotate it, and an actuating connection from the disk to the car-axle, substantially as described.

3. A car-switching mechanism, comprising a deflecting-rail, a cylinder or disk eccentrically journaled on the car, a wheel mounted on said cylinder or disk and adapted when lowered, to engage the deflecting-rail, a gear-wheel attached to said disk and concentric with its journals, a pinion mounted upon the

car-axle, and means for temporarily connecting said gear and pinion when desired, substantially as described.

4. A car-switching mechanism, comprising a deflecting-rail, a cylinder or disk eccentrically journaled on the car, a wheel mounted on said cylinder or disk and adapted when lowered, to engage the deflecting-rail, a gear-wheel attached to said disk and concentric with its journals, a reciprocable rack engaging said gear, a pinion upon the axle, a second reciprocable rack adjacent to said pinion, means for moving said second rack into and out of engagement with the pinion, and connections between the two racks, to reciprocate them together, substantially as described.

5. A car-switching mechanism, comprising a deflecting-rail, a cylinder or disk eccentrically journaled on the car, a wheel mounted on said cylinder or disk and adapted when lowered, to engage the deflecting-rail, a gear-wheel attached to said disk and concentric with its journals, a rack mounted to move horizontally and engaging said gear, a spring connected to said rack to hold and return it in one direction, a pinion upon the car-axle, a second rack adjacent to said pinion, means for moving said second rack into and out of engagement with the pinion, and link connections between the two racks, substantially as described.

6. A car-switching mechanism, comprising a deflecting-rail, a rotatable eccentric journaled upon the car, a deflecting-wheel journaled on the eccentric, a gear fixed to the eccentric and concentric with its journals, a rack engaging said gear and mounted to slide, a spring connected to the rack to hold it in one direction, a pinion mounted upon the car-axle, a second rack engageable with said pinion and having a recess at one end of its toothed portion adapted to engage the pinion to lock the rack, link connections between the two racks, an operating-lever, and sliding connections from the lever to the second rack by which said rack may be raised or lowered, substantially as described.

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WILBUR J. HARRIS.

Witnesses:

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JOHN M. NEGLEY.