No. 638,976. Patented Dec. 12, 1899.

C. MILLS & L. W. PENNEY.

RAILWAY HEAD.

(Application filed Sept. 30, 1898.)

(No Model.) 5 Sheets—Sheet 1.

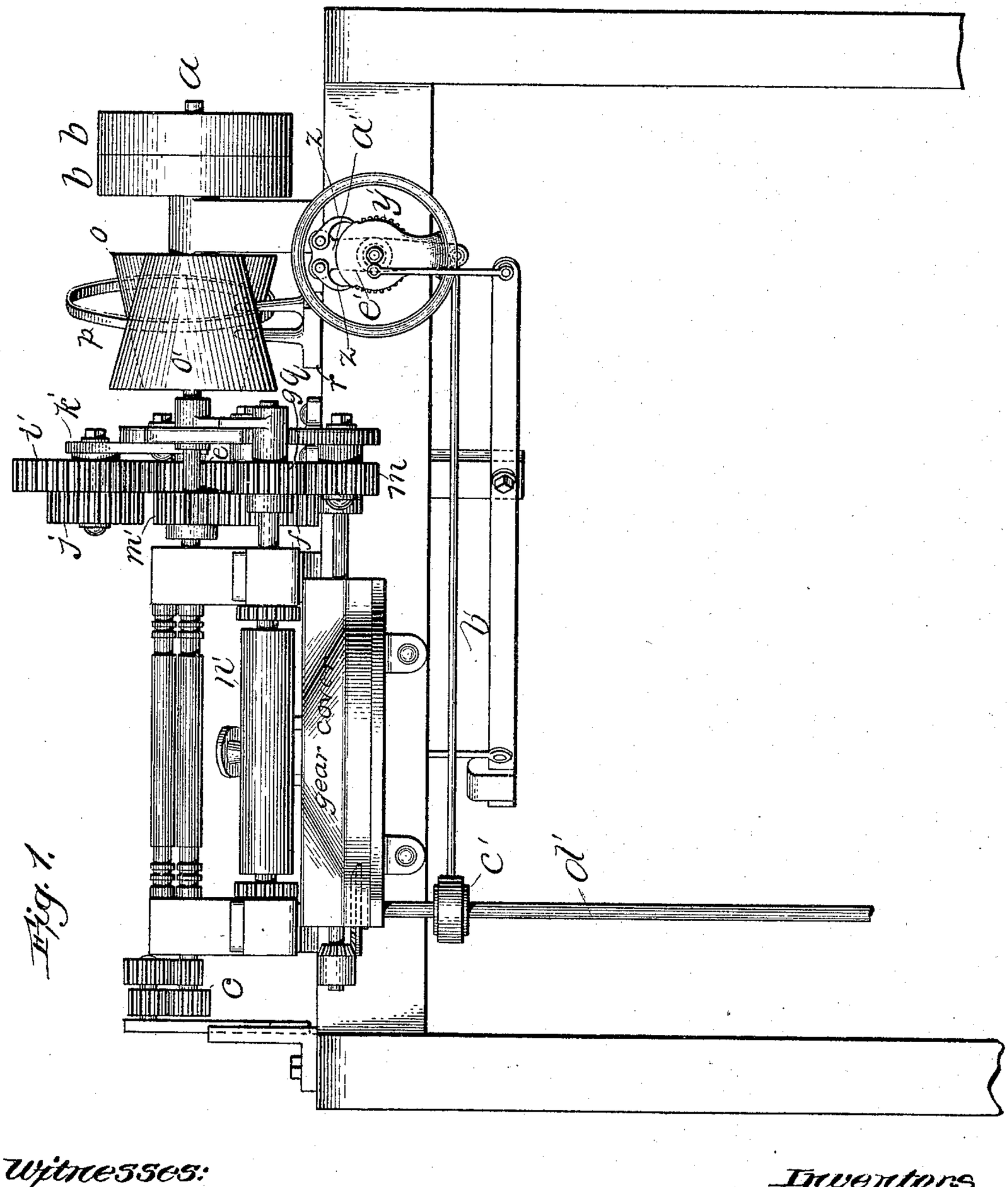


Fig. 1.

Witnesses:
Arthur J. Kendall
Annie J. Dailey.

Inventors.
Chas. Mills
Loren W. Penney
By
Crossley and Goddard
Their Attys.

No. 638,976. Patented Dec. 12, 1899.

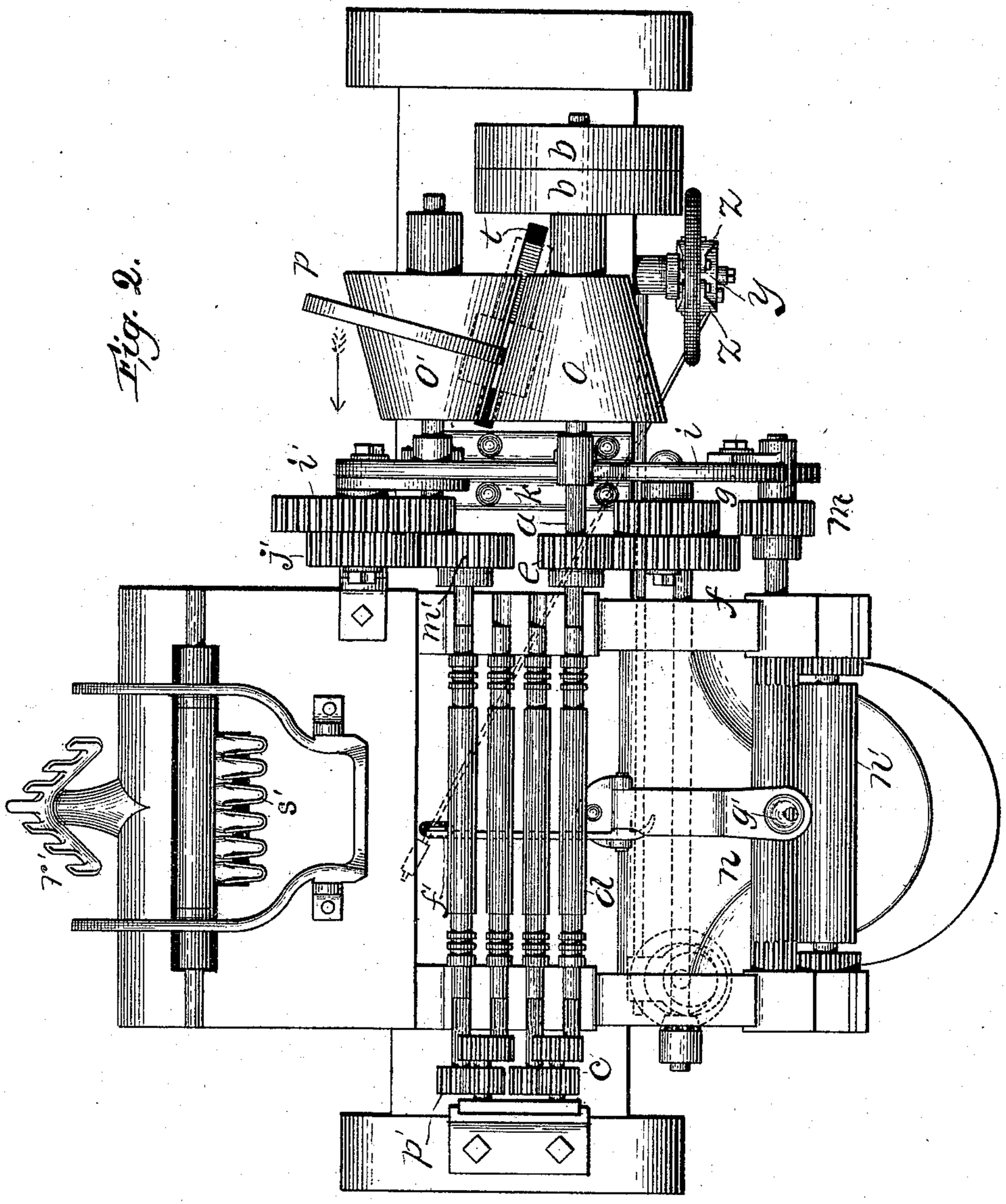
C. MILLS & L. W. PENNEY.

RAILWAY HEAD.

(Application filed Sept. 30, 1898.)

(No Model.) 5 Sheets—Sheet 2.

Fig. 2.



Witnesses:
Arthur F. Randall.
Annie J. Dailey.

Inventors.
Chas. Mills
Loren W. Penney
By
Crosby & Goddard
Attys.

No. 638,976. Patented Dec. 12, 1899.

C. MILLS & L. W. PENNEY.

RAILWAY HEAD.

(Application filed Sept. 30, 1898.)

(No Model.) 5 Sheets—Sheet 3.

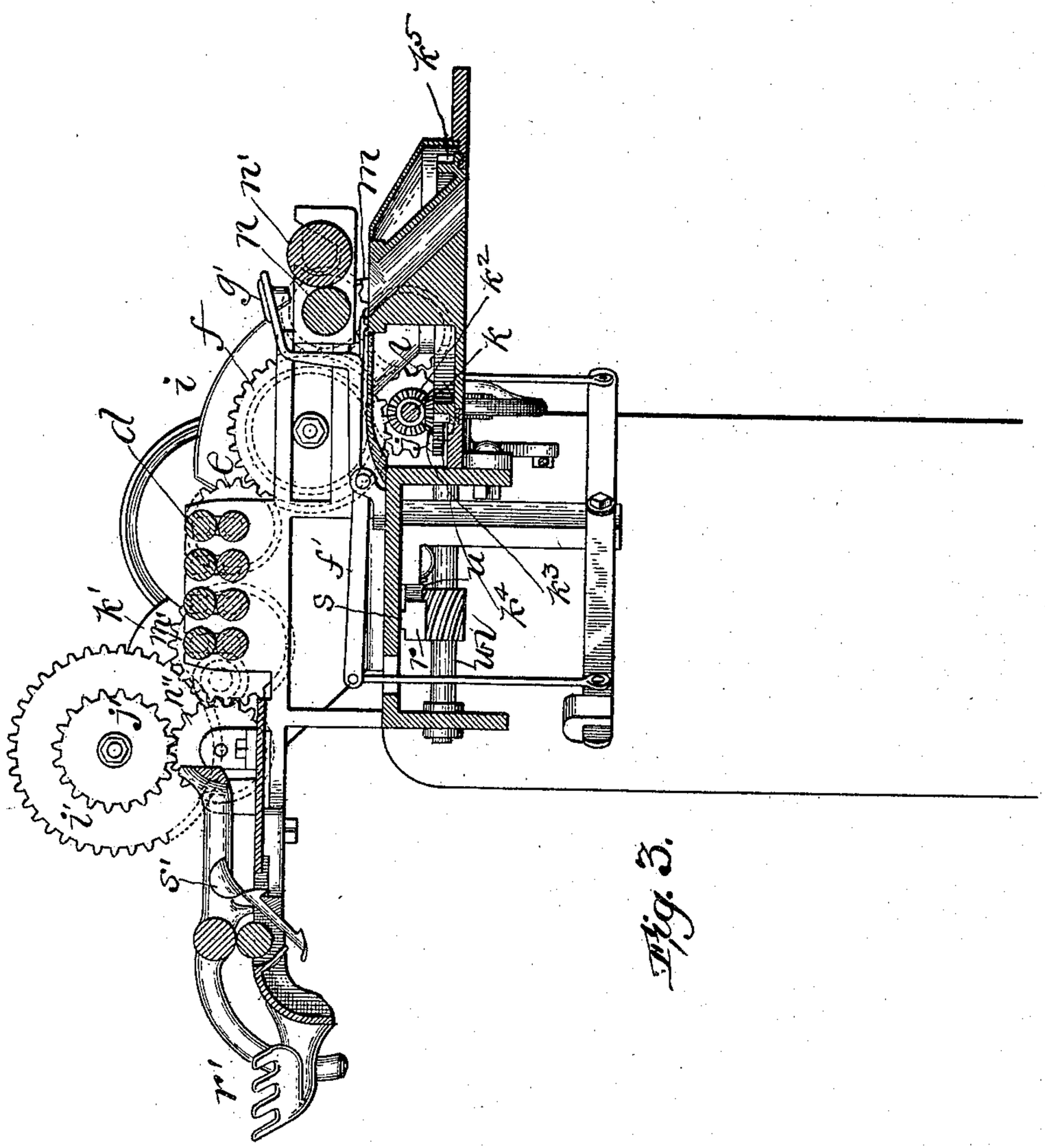


Fig. 3.

Witnesses:
Arthur D. Rundall
Annie J. Dailey.

Inventors.
Chas. Mills
Loren W. Penney
By
Crossley & Goddard.
Attys.

No. 638,976. Patented Dec. 12, 1899.

C. MILLS & L. W. PENNEY.

RAILWAY HEAD.

(Application filed Sept. 30, 1898.)

(No Model.) 5 Sheets—Sheet 4.

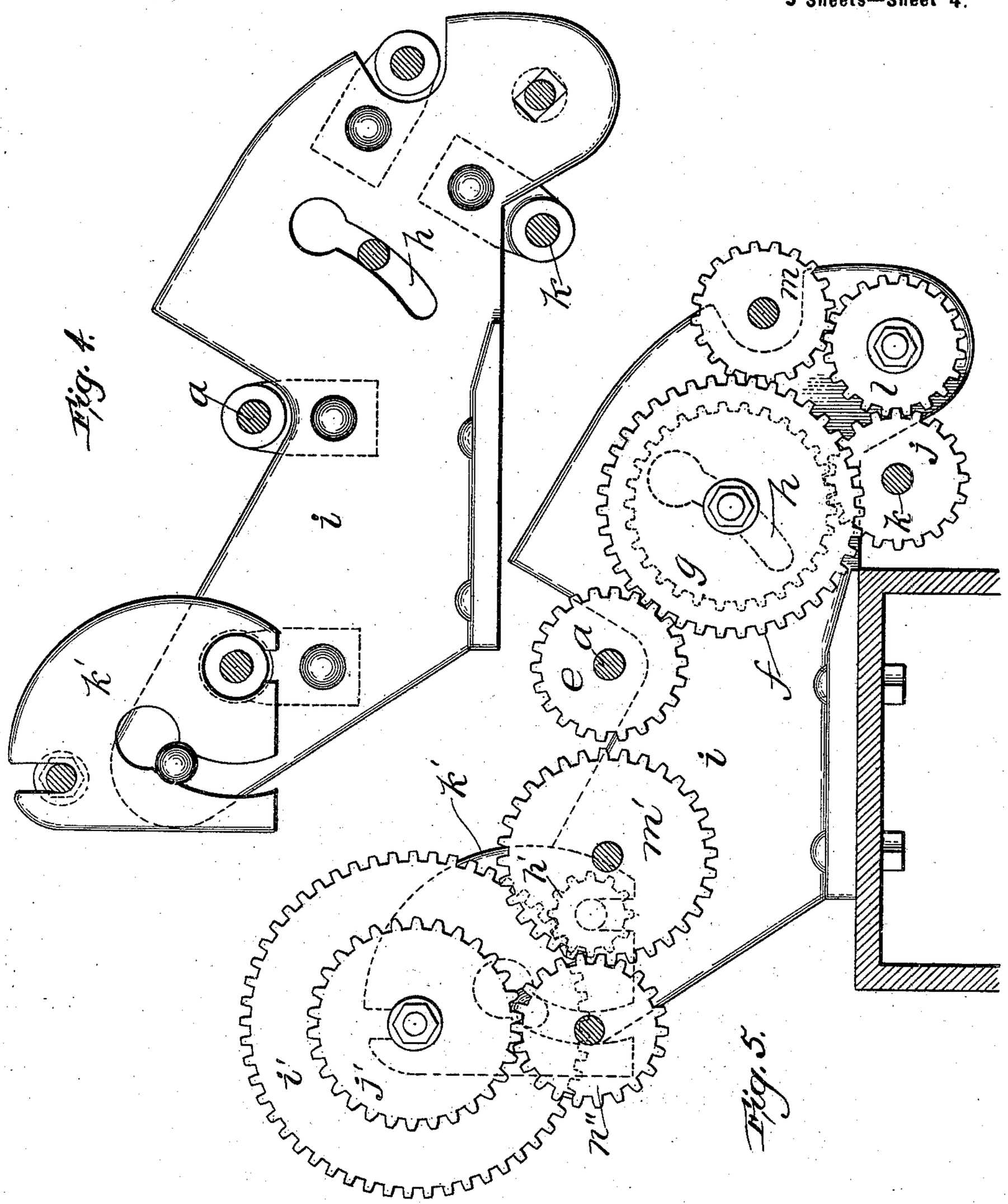


Fig. 4.

Fig. 5.

Witnesses:
Arthur O. Sandall.
Annie J. Dailey.

Inventors.
Chas Mills
Louis W. Penney.
By Crossley & Goddard.
Attys.

No. 638,976. Patented Dec. 12, 1899.

C. MILLS & L. W. PENNEY.

RAILWAY HEAD.

(Application filed Sept. 30, 1898.)

(No Model.) 5 Sheets—Sheet 5.

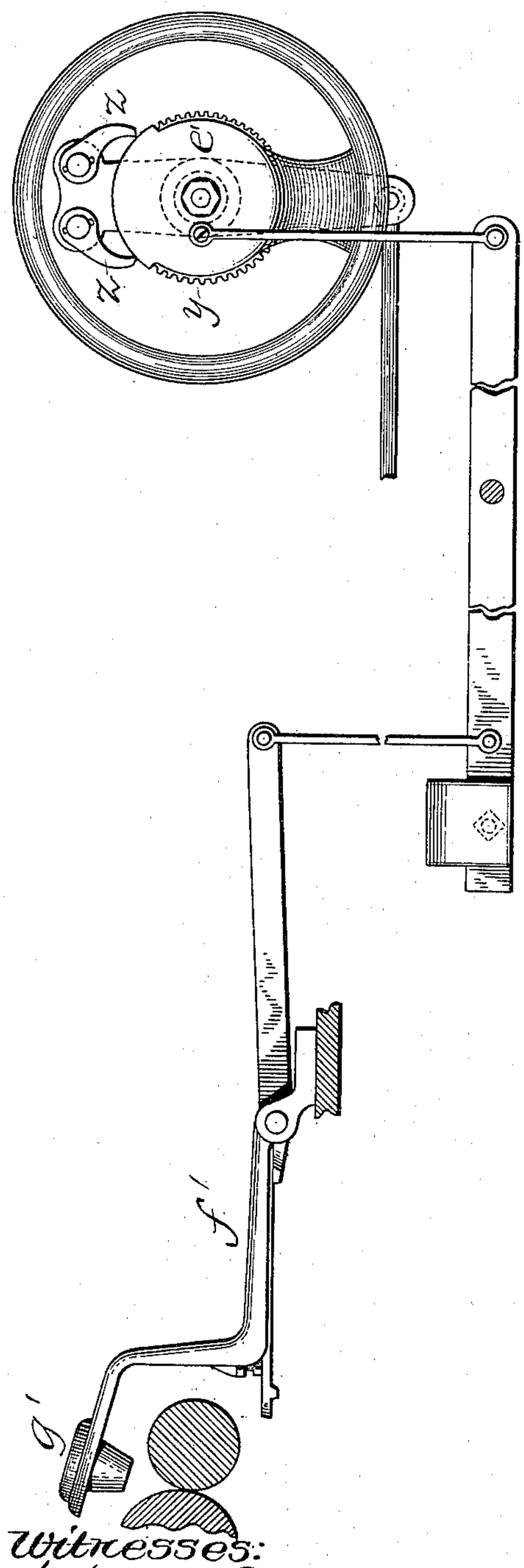


Fig. 6

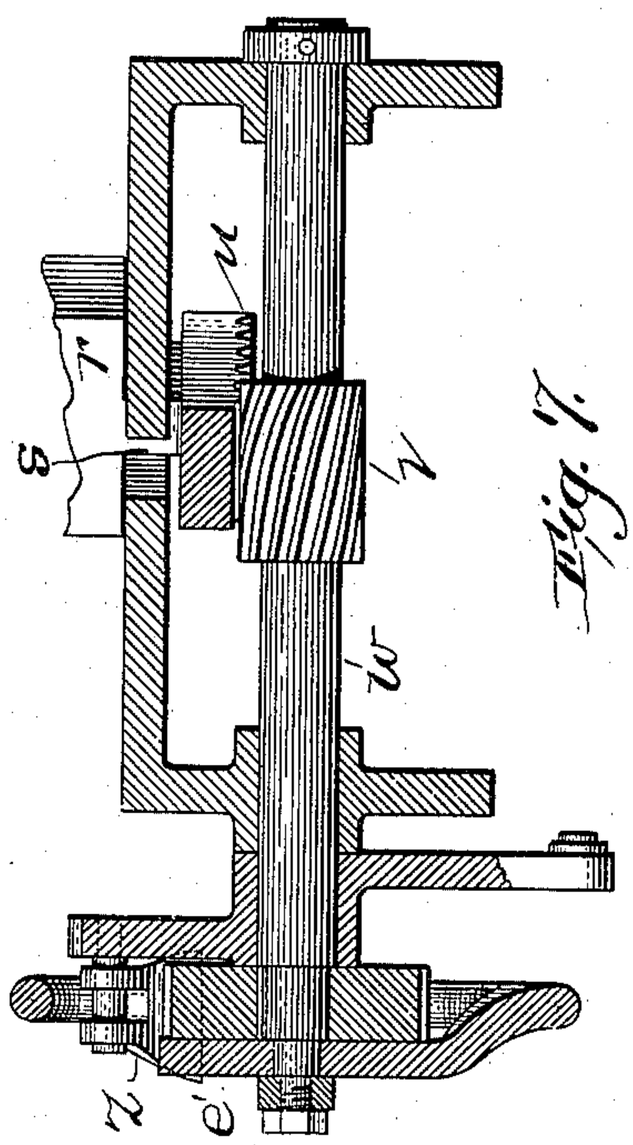


Fig. 7.

Witnesses:
Arthur D. Randall,
Annie J. Dailey

Inventors,
Chas Mills
Loren W. Penney
By Cossley & Goddard
Attys.

UNITED STATES PATENT OFFICE.

CHARLES MILLS AND LOREN W. PENNEY, OF NEWTON, MASSACHUSETTS, ASSIGNORS TO THE SACO & PETTEE MACHINE SHOPS, OF SAME PLACE.

RAILWAY-HEAD.

SPECIFICATION forming part of Letters Patent No. 638,976, dated December 12, 1899.

Application filed September 30, 1898. Serial No. 692,331. (No model.)

To all whom it may concern:

Be it known that we, CHARLES MILLS, of Newton Upper Falls, and LOREN W. PENNEY, of Newton Highlands, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Railway-Heads, of which the following is a description sufficiently full, clear, and exact to enable those skilled in the art to which it appertains or with which it is most nearly connected to make and use the same.

This invention has relation to that kind of drawing-machines in which several slivers are passed through the same set of rollers and are combined into a single sliver and delivered at the front of the machine, the operation being performed for the purpose of diminishing and correcting the irregularities as to thickness or thinness or weight of the slivers.

Because of the manner in which slivers were commonly obtained from the carding-engine for treatment in drawing-machines having the capability mentioned the said machines received and still retain the name of "railway-heads."

In correcting the irregularities mentioned several slivers are not only combined and redrawn as one, so that a very perceptible defect in one of the slivers of the combination will not only be greatly reduced or nearly lost in the newly-produced sliver, but the speed of certain of the drawing-rollers with relation to other drawing-rollers will be accelerated or retarded, as the case may be, when a thin or thick place in the slivers may be passing, so that the unevenness will be as nearly corrected as is possible.

It is the purpose of the invention to greatly simplify the speed-governing means, enhance their efficiency, and bring them up into substantially the same horizontal plane as the drawing-rollers themselves, so that their operation may be the more readily observed or watched and so that they may be corrected when anything happens, if it should, to go amiss or so that they may be manipulated when for other reasons it becomes necessary.

It is also the object of the invention to provide other improvements incidental to the foregoing, all to the ends of bettering the construction and functions of the machine and the ease and readiness with which it may be controlled and handled.

Reference is to be had to the annexed drawings and to the letters of reference marked thereon, the same letters designating the same parts or features, as the case may be, wherever they occur.

Of the drawings, Figure 1 is a front elevation of the improved railway-head complete. Fig. 2 is a plan view of the same. Fig. 3 is a vertical longitudinal sectional view from front to rear of the same. Fig. 4 is a side elevation of the main-gear stand with the gears removed. Fig. 5 is a view similar to Fig. 4, showing the main-gear stand as equipped with gears and as in place on the roller-beam, the latter being represented in section. Fig. 6 is a side view, partially in section, of a part of the speed-governing means. Fig. 7 is a partially-sectional detail view of the means for shifting the friction-ring between the two cones for controlling the speed of the back rollers.

In the drawings, *a* designates the front roller or driving-shaft, on which are the fast and loose pulleys *b b* to receive the driving-belt. (Not shown.) The said driving-shaft is compounded or integral with the foremost lower drawing-roller and is provided on its end opposite to that at which the driving-pulleys are carried with one of a train of gearing *c*, properly cut, arranged, and timed to operate or drive the lower drawing-roller immediately in rear of the first-named roller. Thus the front two sets of drawing-rollers will be driven uniformly by direct connection with the driving-shaft. On the driving-shaft *a*, between the foremost lower drawing-roller and the pulleys, is, furthermore, affixed a gear *e*, which engages a gear *f*, secured upon the hub of a gear *g*, the said hub of the latter gear being adjustable in a slot *h* of the main-gear stand *i*, said slot being formed on a curve concentric with the axis of the main shaft. The gear *g* is a change-gear for effecting change of speed and the adjustment provided for through the medium of the slot *h* is to keep the gears *f* and *g*, influenced by adjustment in said slot, in proper mesh with the gears which they engage. The gear *g* engages and drives the gear *j* on the coiler-gear shaft *k*, and the latter gear

through the medium of an idler l drives the gear m, which operates the calendering-rollers n n', which are suitably geared together.

o o', in connection with the friction-ring p, operatively connecting them, constitute what are commonly known as "friction-cones," the cone o on the driving-shaft being the driving-cone and the cone o' the driven cone.

The friction-ring p, by which the cone o' is driven from the cone o, is engaged by the fork q of a carriage r, having a web s, which extends through a diagonal slot t in the bed of the machine, the said carriage being provided with a rack u on its under side. The rack u is engaged by a spiral gear secured on the ratchet-shaft w, extending from front to rear below the bed. The said shaft w is provided on its front end with a ratchet-wheel y, which is adapted to be engaged by one or the other of two oppositely-arranged pawls z on the upper end of a vibratory pawl-carrier a', loose on the shaft and actuated through the means of a reciprocatory rod b', operated by an eccentric c' on the vertical shaft d', which turns the table on which the coiler-can (not shown) rests.

The ratchet-wheel y has a segment of its teeth (extending a little more than the distance between the free ends of the pawls z) covered by a movable tooth shield or coverer e'. This tooth-coverer is loose on the shaft and operatively connected, through the medium of a lever and pitmen, with what is to all intents and purposes the rear end of the trumpet-lever f'. When a sliver of just the right thickness is running through the trumpet g', the gear shield or coverer e' will be held in such position that neither of the pawls z will engage the teeth of the ratchet-wheel y, but when the sliver runs too thick the tooth-coverer will be moved so as to allow one of the pawls to become effective in operating the ratchet-wheel, while the other pawl is prevented by the tooth-coverer from engaging the ratchet-teeth of the wheel y, and when a thin place occurs in the sliver the trumpet will be allowed to rise and the tooth shield or coverer e' will be moved so as to permit the other pawl to become efficient and move the ratchet-wheel in the opposite direction.

The driven cone o' is the driving means for the back set of drawing-rollers, it being provided with a pinion h', which engages and drives the crown-gear i' and also drives the change-gear j', the latter being secured to the hub of the gear i'. The gears i' j' have their bearings in the bracket k', adapted to be swung on a circle concentric with the shaft l' of the driven cone o'. The change-gear j' engages and drives the idler n'', which in turn engages and drives the back-roll gear m' on the rearmost lower drawing-roller, the latter being connected by gearing p' with the lower roller next forward. By the construction mentioned the change of the gearing can be readily effected and all of the gears kept in proper mesh and relationship. From this it will be seen that when the sliver is running too light and the trumpet rises, causing the friction-ring shipping-carriage to be moved inward, carrying the friction-ring p with it, the speed of the rear set of rollers is accelerated, and when the stock runs too heavy the opposite effect will take place, slowing down the speed of the back rollers and attenuating the sliver.

The slivers may be taken from the guides r and spoons s, through or over which they pass and which may be of the usual construction.

As railway-heads were heretofore constructed the entire mechanism was driven through the medium of the cones arranged under the table.

By the improvements mentioned the speed changing and governing means are greatly simplified in construction and brought above the machine-table, where their operation can be readily watched. The space under the table being formerly occupied by complicated movements, we were compelled to weight the top rolls by a complication of weights and levers. This space is now free to be used for direct and independent weighting of each top roll. The dead-weights hang free under the table exactly as on an ordinary drawing-frame.

The oblique slot in the bed provides a certain means for guiding the fork which engages the speed-changing friction-ring.

The coiler-gear shaft k is provided with a miter-gear k^2, engaging a like miter-gear k^3, compounded with a gear k^4, which engages the teeth of the coiler-gear k^5 through the tube in which the sliver passes as it comes from the calender-rollers and by which coiler-gear the sliver is delivered to the can. (Not shown.)

The machine as a whole is compact and simple in construction, and it is certain in its operation, while having the improved functions hereinbefore recited.

Having now fully set forth the nature and design of the improvements and described a way of constructing and using the same, though without attempting to describe all of the equivalent forms of the said improvements or all of the various methods of their employment, it is declared that what is claimed is—

1. In a railway-head, the combination with the front and rear sets of drawing-rollers; of a driving and a driven friction-cone in substantial horizontality with each other and with the drawing-rollers and geared to the two sets of the latter respectively; together with sliver-controlled means for varying the speed of the driven cone.

2. In a railway-head the combination of front and rear sets of drawing-rollers, a driving-shaft compounded with a roller of one set; a driving friction-cone carried by said shaft; a driven friction-cone in substantial horizontality with the driving-cone, and geared to a

drawing-roller of the other set; together with sliver-controlled means for varying the speed of the driven cone.

3. In a railway-head, the combination of front and rear sets of drawing-rollers; a driving-shaft practically one with a lower roller of one set; gearing connecting said roller with the others of its set; a driving friction-cone carried by said shaft; a driven friction-cone in substantial horizontality with the driving-cone and geared to a lower drawing-roller of the other set; gearing connecting said latter roller with the others of its set; and sliver-controlled means for varying the speed of the driven cone.

4. In a railway-head, the combination, with the bed of the machine provided with an oblique slot and drawing-rollers, of a set of friction-cones above the bed for varying the speed of the drawing-rollers, the friction-ring, a carriage provided with a fork for engaging the said ring, part of said carriage extending through the said slot, and means below the bed for moving the carriage.

5. The combination, with the bed of the machine provided with a slot and the two sets of drawing-rollers, of a pair of friction-cones and their friction-ring above the bed of the machine, means for shifting the friction-ring extending through the said slot, and means below the bed for acting upon the ring-shifting means.

6. In a railway-head, the combination of the supporting beam or bed; the drawing-rollers arranged above the same; friction-cone gearing also above said beam or bed and geared to the drawing-rollers; a shifter associated with said cone-gearing and extending through the bed; a shaft geared to said shifter and carrying a ratchet; pawls for turning the ratchet and its shaft; an oscillating pawl-carrier on the shaft; a vertical coiler-shaft having an eccentric; operative connections between the latter and the pawl-carrier; and a sliver-controlled ratchet-shield normally preventing engagement between the pawls and the ratchet.

In testimony whereof we have signed our names to this specification, in the presence of two subscribing witnesses, this 12th day of August, A. D. 1898.

CHARLES MILLS.
LOREN W. PENNEY.

Witnesses:
WM. L. THOMPSON,
CHAS. R. BROWN.