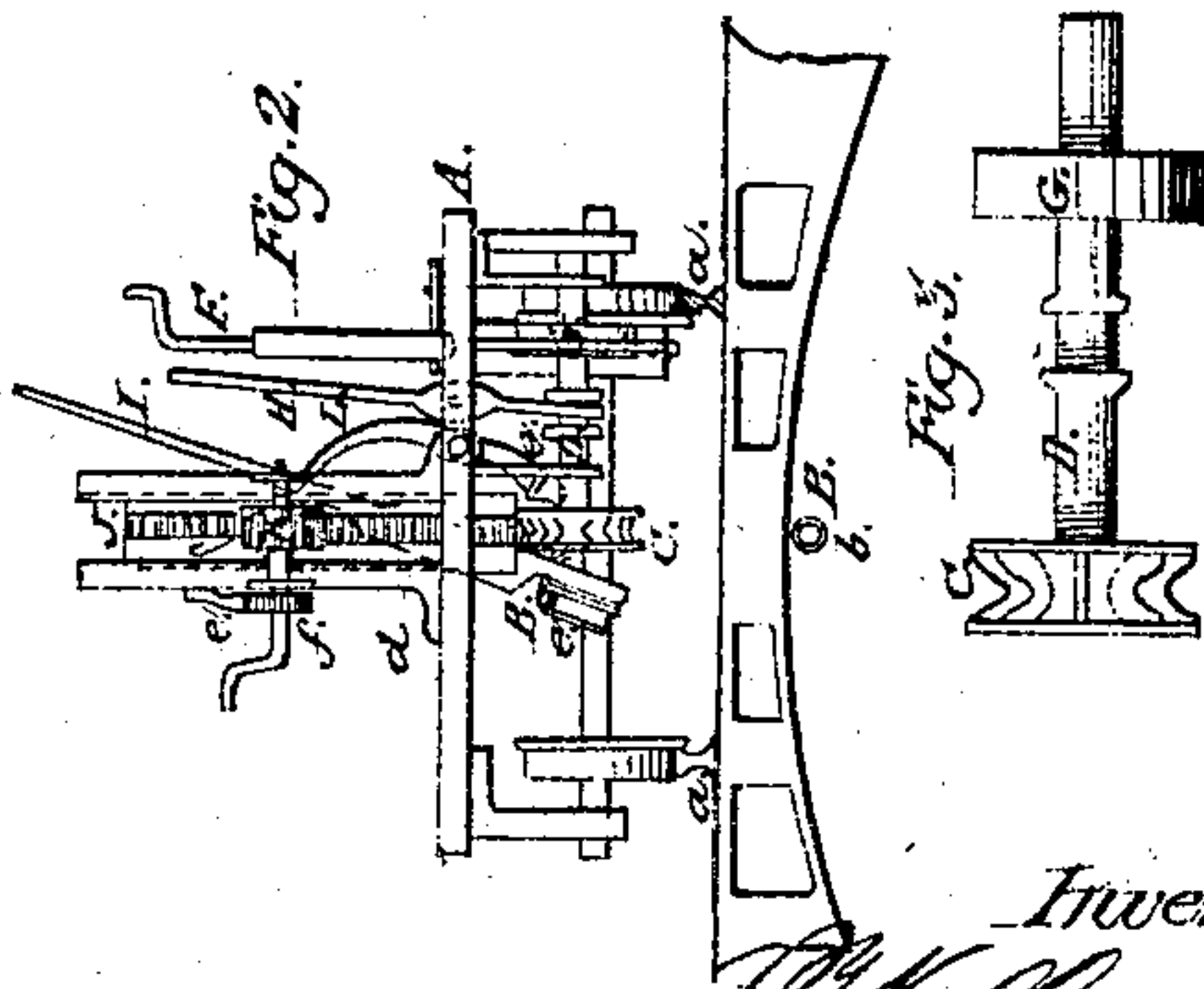
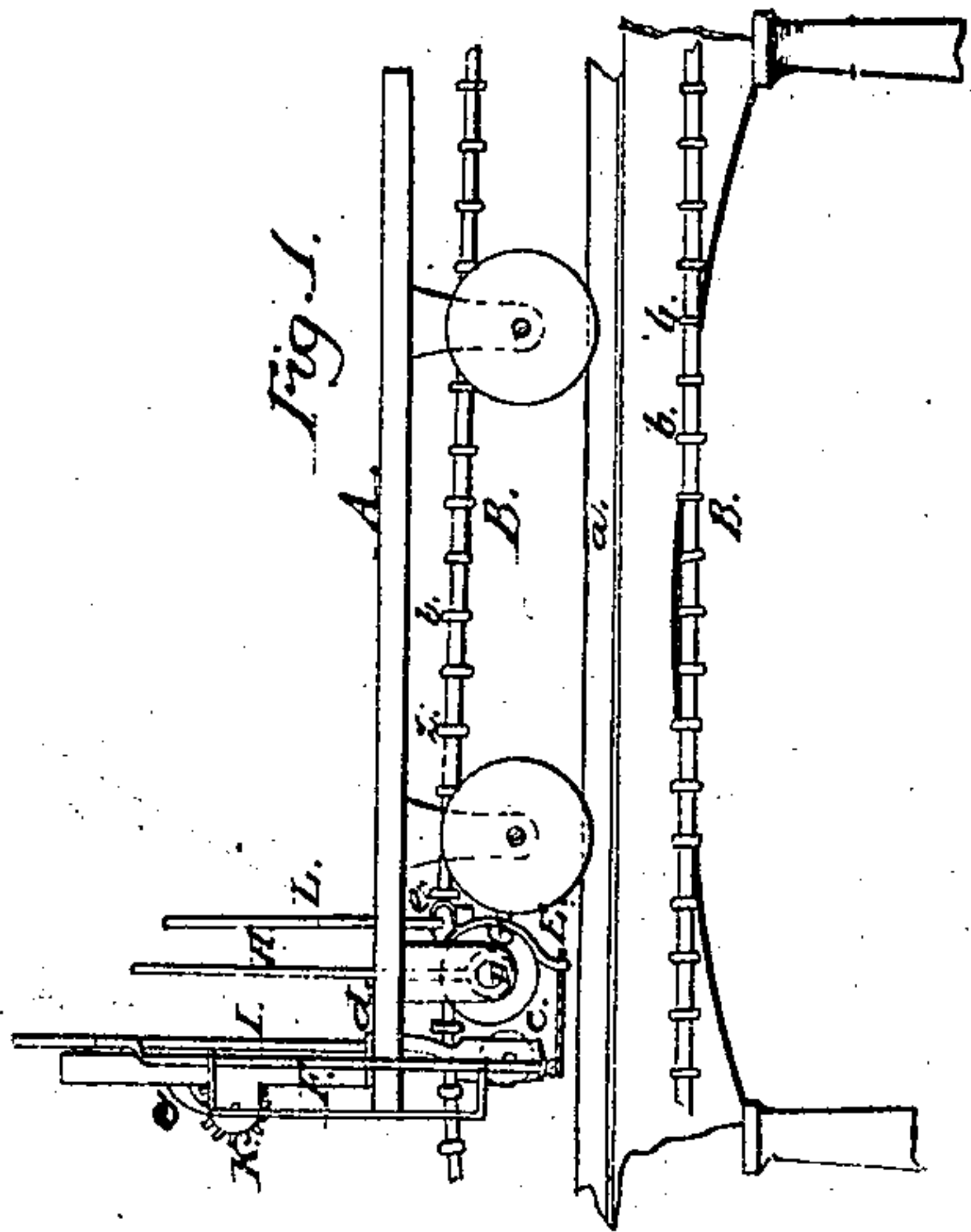
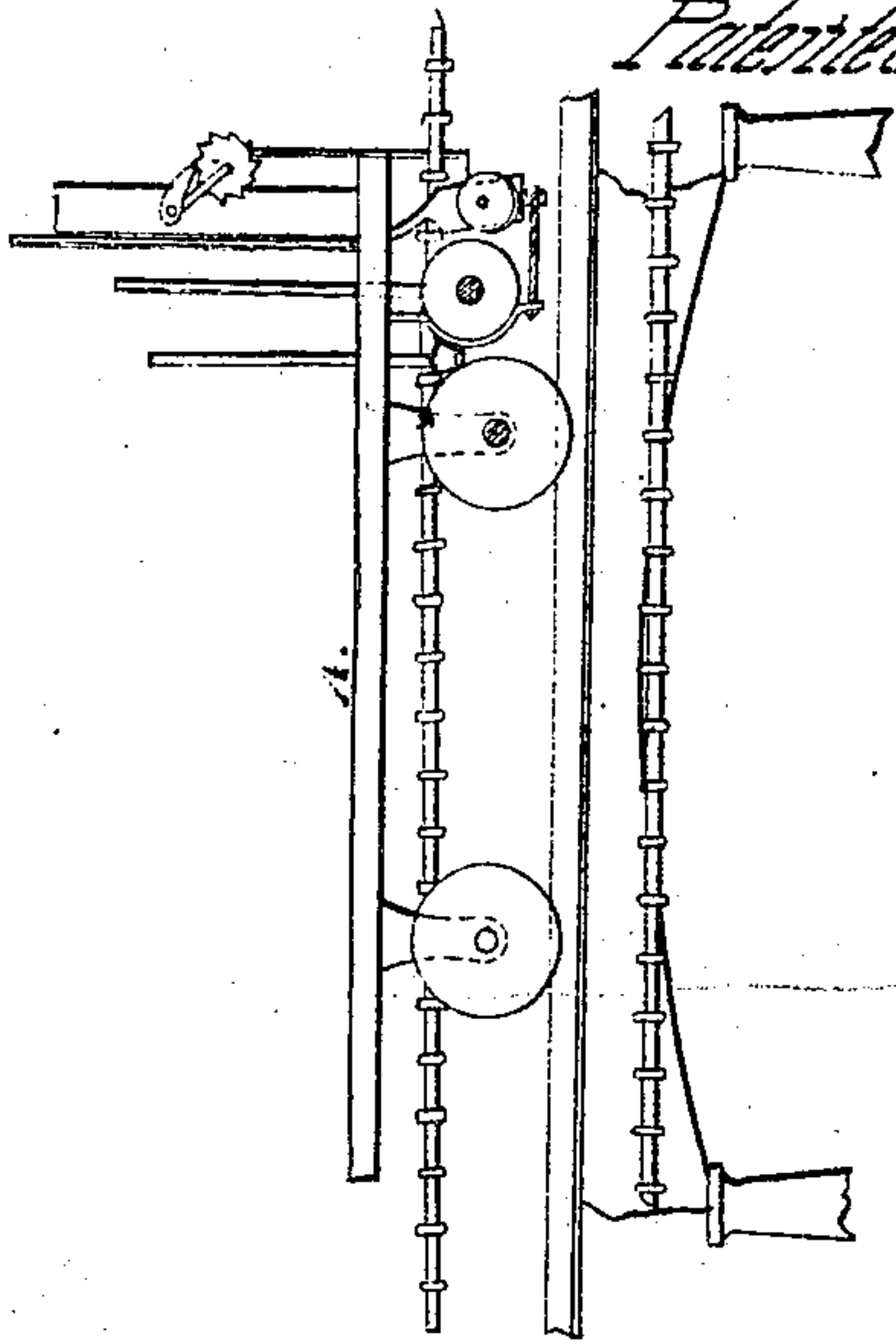


Sutton & Crowell

Elevated Railway.

N^o 87,077.

Patented Feb. 16, 1869.



Witnesses:

J. D. Coombs
A. Kummer.

Inventors:

William A. Sutton
Eugene Crowell

United States Patent Office.

WILLIAM A. SUTTON, OF NEW YORK, N. Y., AND EUGENE CROWELL,
OF SAN FRANCISCO, CALIFORNIA.

Letters Patent No. 87,077, dated February 16, 1869.

IMPROVEMENT IN ELEVATED RAILWAYS.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that we, WILLIAM A. SUTTON, of the city, county, and State of New York, and EUGENE CROWELL, of the city of San Francisco, in the county of San Francisco, and State of California, have invented a new and useful Improvement in Elevated Railways, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing, which forms part of this specification, and in which—

Figure 1 represents a side elevation of a section of an elevated railway, with our improvement or improvements applied thereto;

Figure 2, an end elevation of the same; and

Figure 3, a view of a sprocket and friction or brake-wheel used in establishing connection with the rope by which the traction is effected.

Similar letters of reference indicate corresponding parts.

This improvement relates to elevated and other railways on which the cars are drawn by an endless rope set in motion by stationary power.

First, the invention consists in a combination of a brake and brake and sprocket-wheels, carried by the car, so arranged and operating as that, while the sprocket-wheel is free to rotate, when the brake is off, or during the early application of it, and until the extreme or gripping-pressure is applied, by the run of the endless rope over and in gear with it, a positive as contradistinguished from a frictional hold of such wheel on the rope is established, to effect the traction by or through the operation of the brake.

Secondly, the invention consists in a rope-lifter, which, in addition to its having a rising and falling motion, is so hung as to be capable of an independent lateral movement, to facilitate the picking up and placing of the rope on or over the sprocket-wheel.

Thirdly, the invention embraces, in combination with such a rope-lifter, a sliding or lateral-adjusting arrangement of the sprocket or rope-gearing wheel.

Fourthly, the invention includes a combination of a rope take-off or shifter with a sliding or laterally-adjustable sprocket or rope-gearing wheel.

Referring to the accompanying drawing—

a a represent the rails of an elevated or overhead street-railway, on which cars *A A* are arranged to run, through traction of an endless rope, *B*, passing over drums at the ends of a section, and set in motion by any suitable stationary driving-power.

This endless rope *B* is formed or provided, throughout its length, with knots, protuberances, or bosses, *b*, of the same as or any different material to the rope, which is of a universally-flexible character, as contradistinguished from a chain, said knots or protuberances being arranged at short, regular distances apart.

The car or cars *A A* carry a sprocket-wheel, *C*, hung

on a horizontal shaft, *D*, said wheel being pitched to accord or gear with the knots *b* on the rope, so that, when said wheel is allowed to run free or rotate, and the upper line or length of the rope arranged over such wheel, the knots *b* will fall into pitch, or gear with it; but the rotation of said wheel by the rope is not used to produce traction of the car, which remains stationary under a free run of said wheel.

To establish traction, the wheel *C* is locked, or held from rotating, so that the connection of the car with the rope is, by means of the knots *b* and sprocket-character of said wheel, a fixed or positive one, as contradistinguished from a mere or direct frictional hold on the rope, which is apt to chafe and wear the latter.

To prevent severe shock or strain, however, such connection of the car with the rope, while the latter is in rapid motion, should be made and broken in a gradual or easy manner.

This is done by gradually applying or letting off the friction, which serves to hold the wheel stationary, through means of a brake, *E*, operated by a rod, *F*, from the platform of the car, and biting on or against a wheel, *G*, attached to the shaft *D* of the wheel *C*.

It is desirable to give to the sprocket-wheel *C*, a sliding or lateral adjustment, relatively to the rope, to place it in line with or away from the latter, to facilitate the putting on and taking off of the rope, and to keep said wheel out of gear with the rope, when the car is required to remain at rest, so as to avoid objectionable wear of said wheel at its shaft in the bearings.

Thus the shaft *D*, which carries the wheels *C* and *G*, is made capable of a longitudinal-sliding motion, by means of a lever, *H*, operated from the platform.

Said shaft *D* is only arranged to extend half way or partially across the car, so that the one side or face of the wheel *C* is free, and presents no obstruction to the passage of the rope over or across it, in putting the latter on and off.

To put the rope on the wheel *C*, we employ a rope-lifter, made up of a sheave, *c*, attached to a lever, *I*, which is also arranged to be operated from the platform, and is pivoted, as at *d*, to a vertically-sliding rack, *J*, that is raised or lowered by rotating, through a crank or handle, a pinion, *K*, a pawl, *e*, and ratchet-wheel, *f*, serving to hold the rope-lifter at its raised or lowered positions.

Supposing the rope *B* to be off the wheel *C*, and it be required to put it on the same, then, the brake *E* having been slackened, so as to leave the wheel *C* free to rotate, and said wheel preferably drawn to one side, by means of the lever *H*, the pinion *K* is rotated, to lower the rack *J*, till the sheave *c* be sufficiently depressed, so that, by proper manipulation of the lever *I*, it is brought under the upper run or length of the rope, and, on turning the pinion *K* in a reverse direc-

tion, to raise the rack, said sheave made to hold the rope over the plane in which the wheel O stands when the car is in motion, whereby, on adjusting said wheel back to such position, supposing it to have been slid therefrom, and lowering the sheave *c*, through the rack J, the rope is dropped into gear with such wheel, and the sheave *c* released from contact with the rope. Friction, through the brake B, is then gradually applied to wheel G, till the wheel O, which previously rotated with the speed of the rope, is locked, or brought to a state of rest, and the positive connection with the rope thereby established, motion having been gradually communicated to the car during the process of putting on the brake.

To disconnect a car from the continuously-travelling rope, the brake is as gradually slacked off, and a tapering sheave, *e*, operated by a lever, L, made to catch under the rope, and to lift and force it to the off side of the wheel O. This removes the rope from the wheel O, after which a reverse movement is given to the lever L and its sheave, *e*, so as to drop the rope.

From this description, it will be perceived that every facility is afforded for connecting or disconnecting cars at any point on the route, without that frictional wear or chafing of the continuously-travelling rope which

attaches to a direct frictional hold on it, and without a sudden jerk or strain.

Instead of the knotted rope B, a chain may be used.

What is here claimed, and desired to be secured by Letters Patent, is—

1. The combination of the sprocket-wheel C and brake, applied to hold the same, with the endless rope B, having knots, collars, or protuberances, *b*, on it, essentially as herein set forth.

2. The rope-lifter, constructed, substantially as described, of a sheave, *c*, carried by a lever, L, which is pivoted to a rack, J, operated by a pinion, K, essentially as herein set forth.

3. The combination, with a rope-lifter, constructed to operate substantially as described, of the sprocket-wheel C, arranged to have a sliding motion or lateral adjustment relative to the rope, essentially as specified.

4. The rope take-off or shifter *e* L, in combination with the sprocket-wheel C, arranged to have lateral adjustment relatively to the rope, substantially as described.

WILLIAM A. SUTTON.
EUGENE CROWELL.

Witnesses:

FRANCIS L. TIFFT,
HENRY PALMER.