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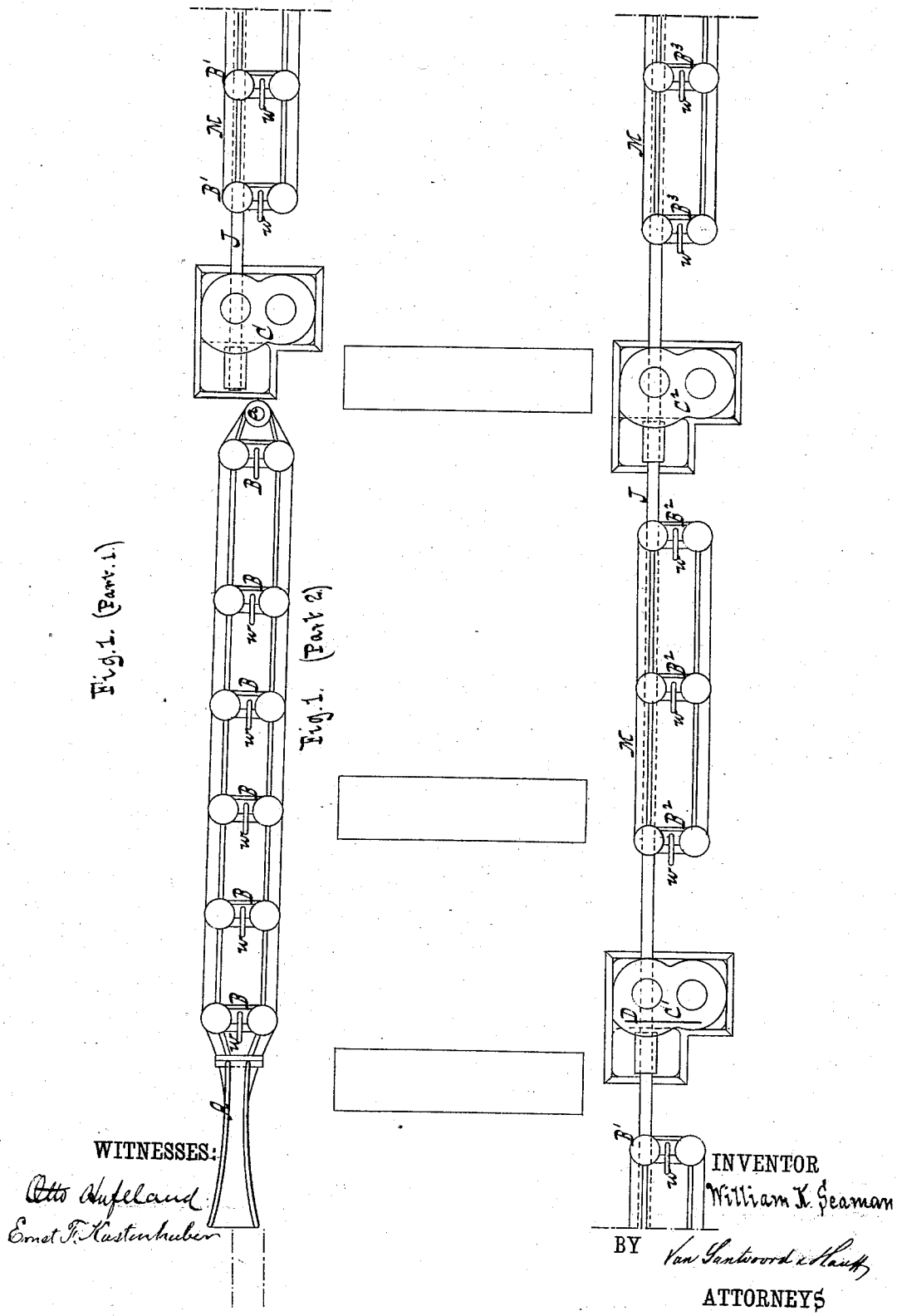
W. K. SEAMAN.

MACHINERY FOR CARRYING, CUTTING, AND CAMBERING RAILROAD RAILS

No. 261,769. Patented July 25, 1882.



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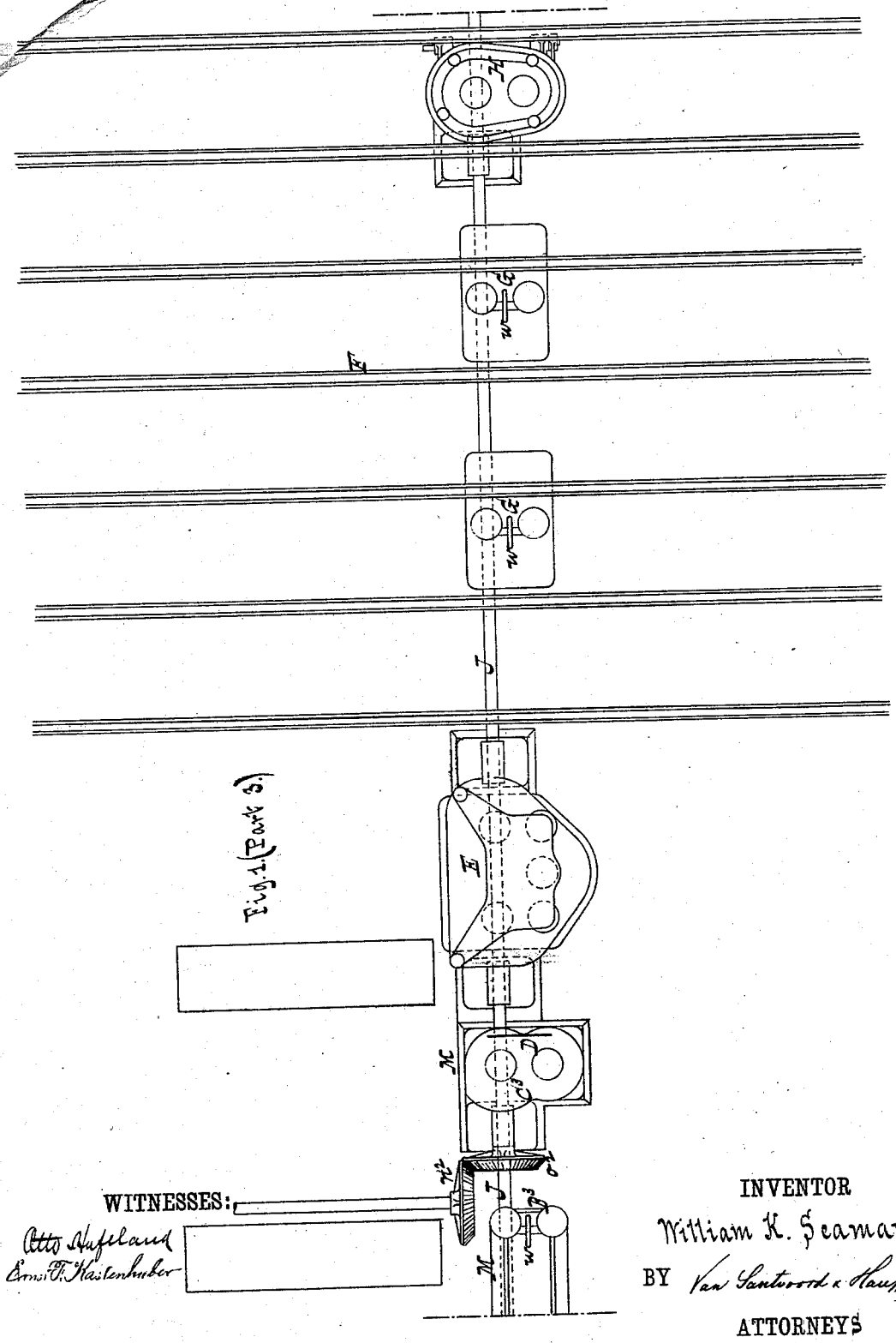

Fig. 1. (Part 3.)

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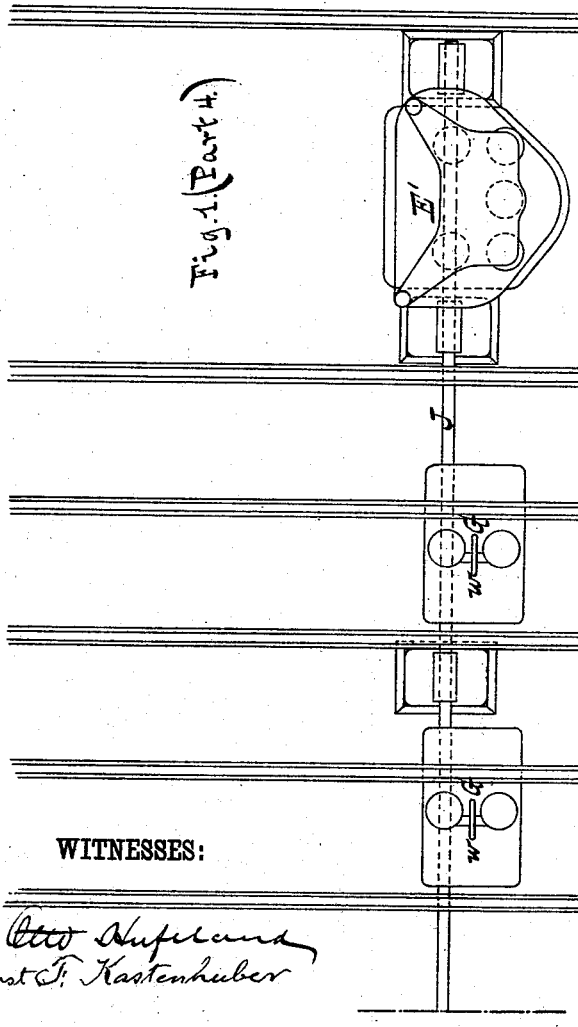

Fig. 1. Part 4.

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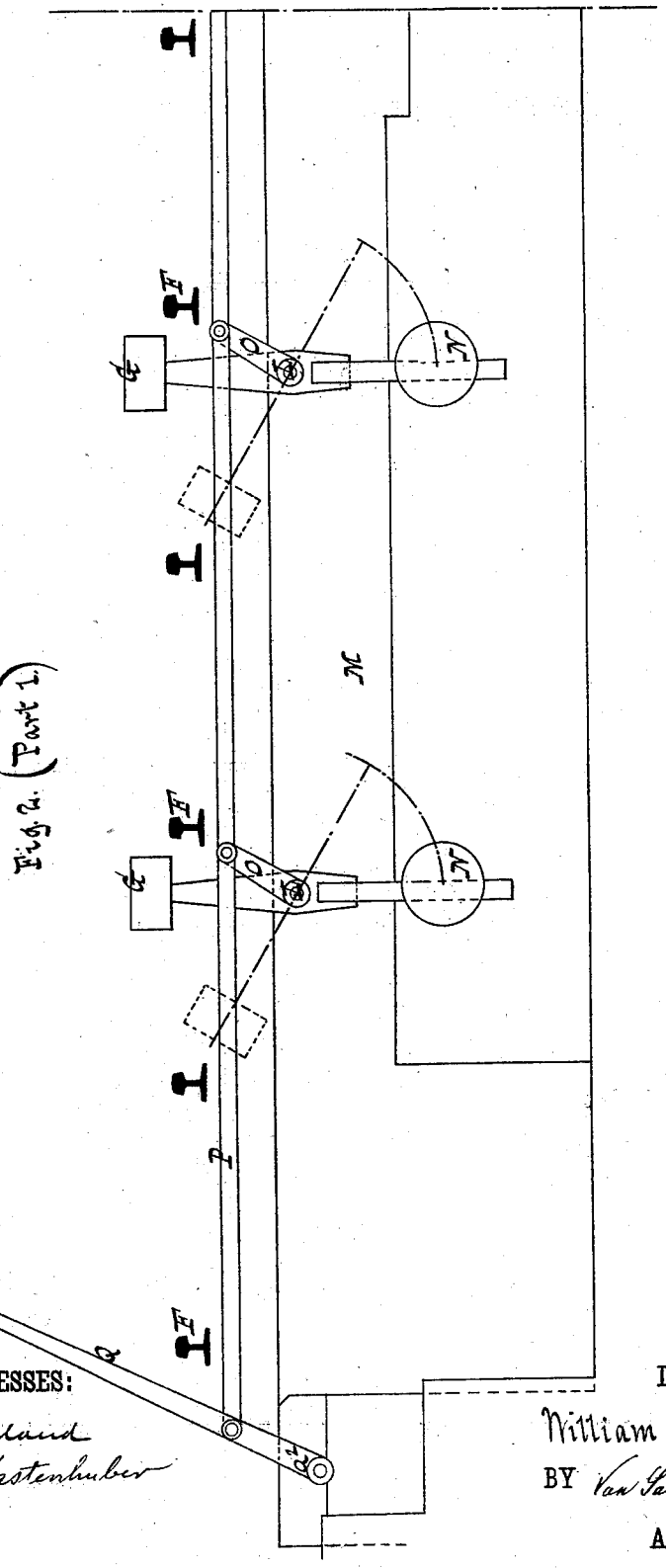

Fig. 2. (Part 1.)

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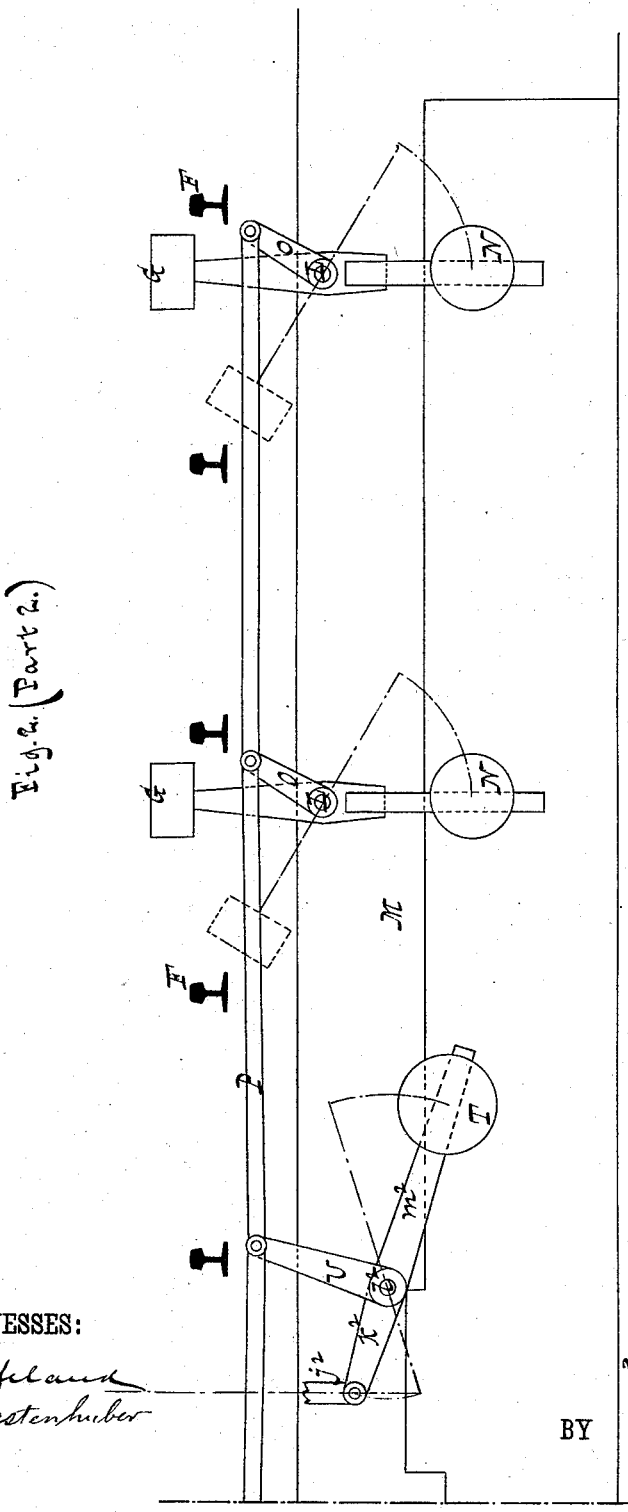

Fig. 2. (Part 2.)

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Fig. 3.

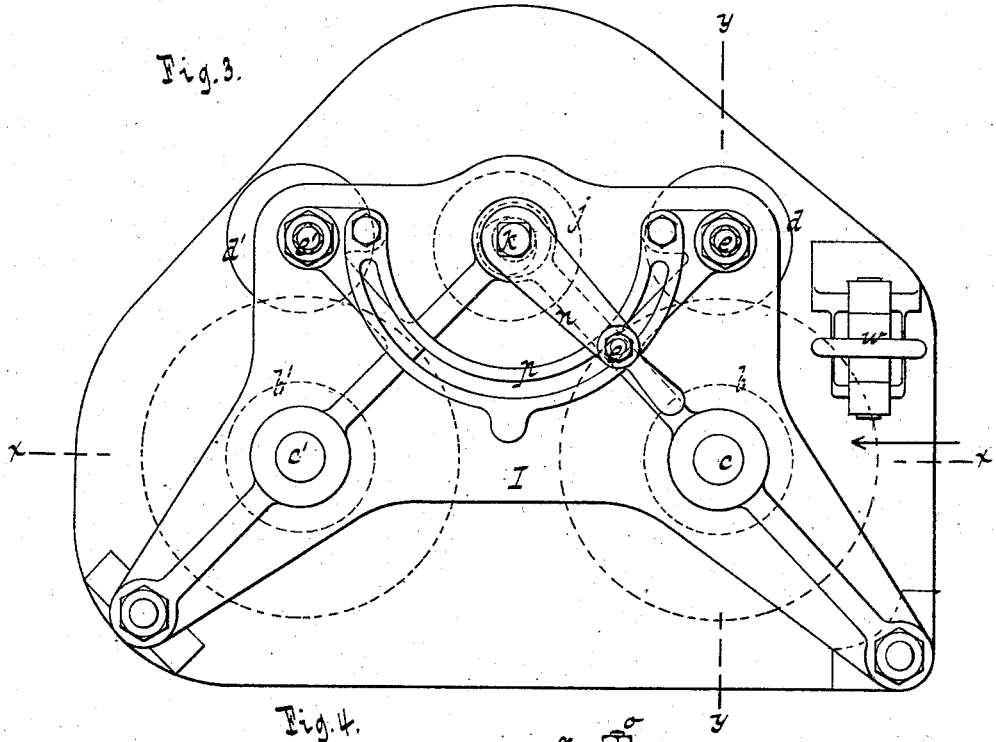

Fig. 4.

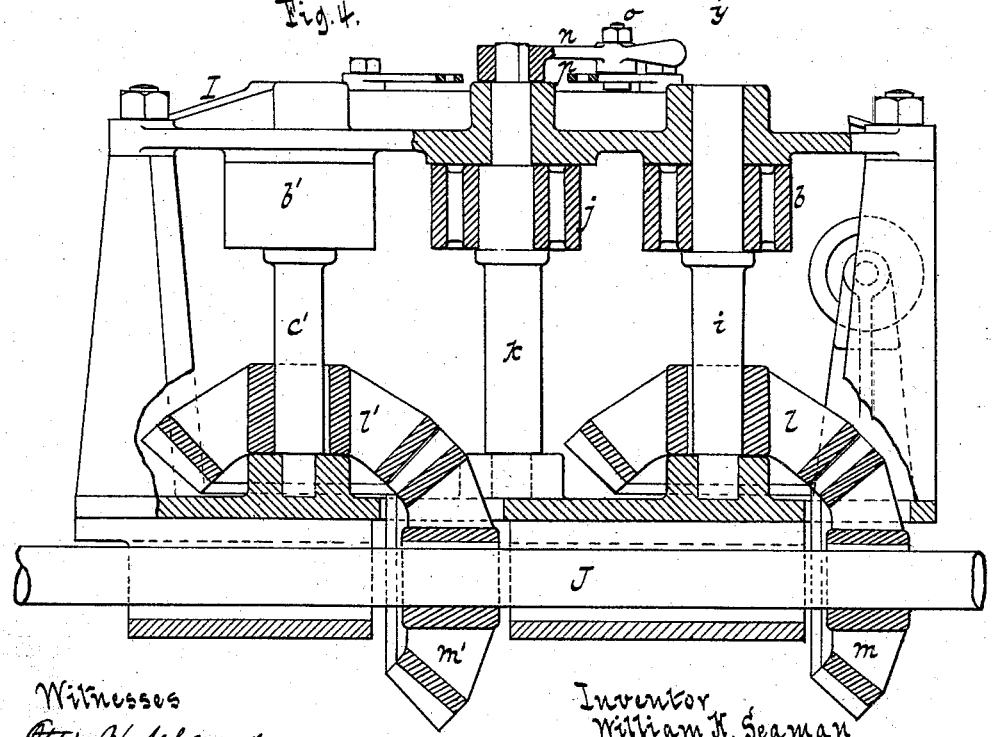

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Fig. 5.

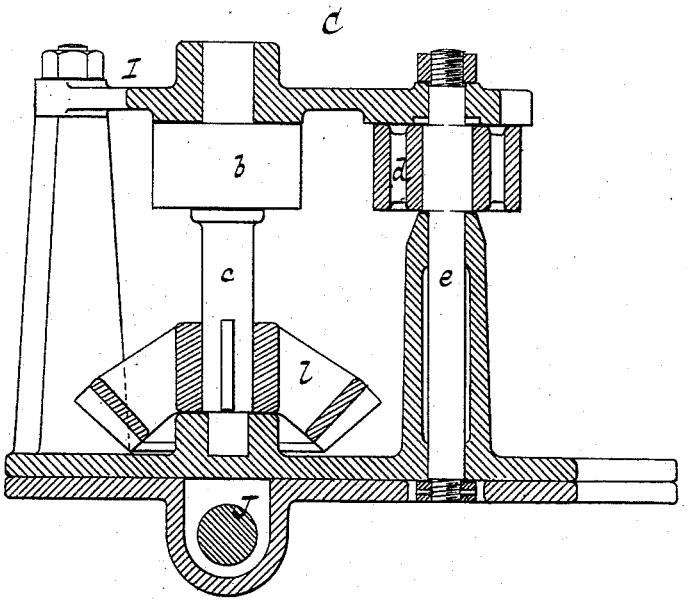

Fig. 6.

Fig. 7.

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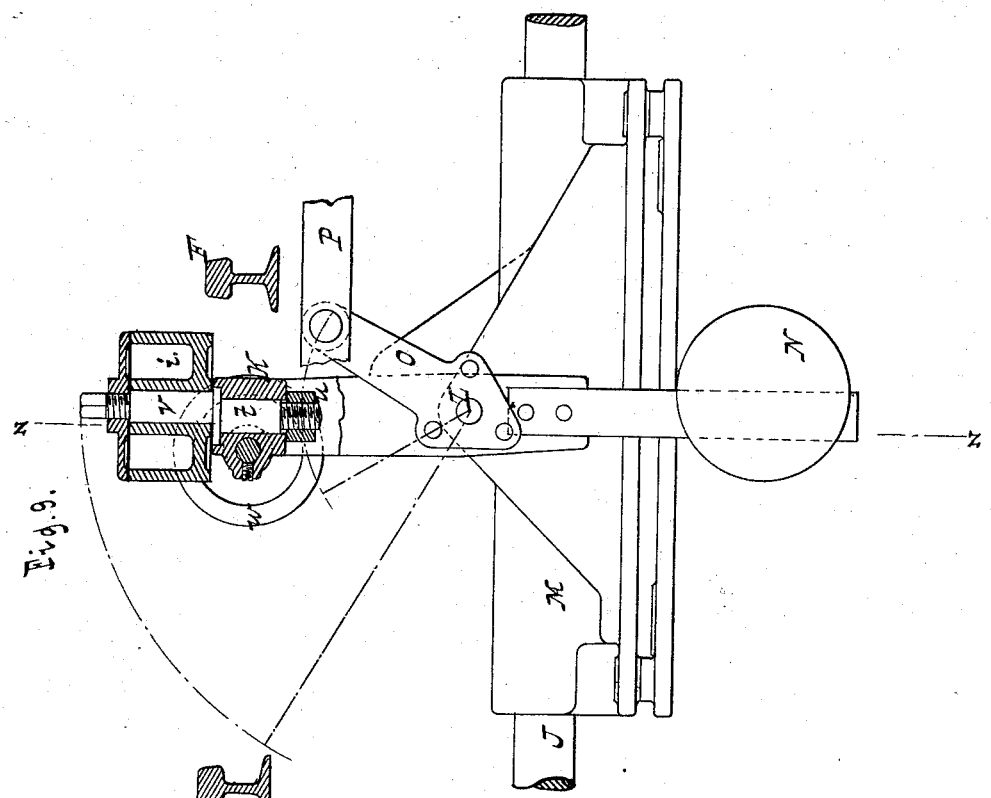

Fig. 9.

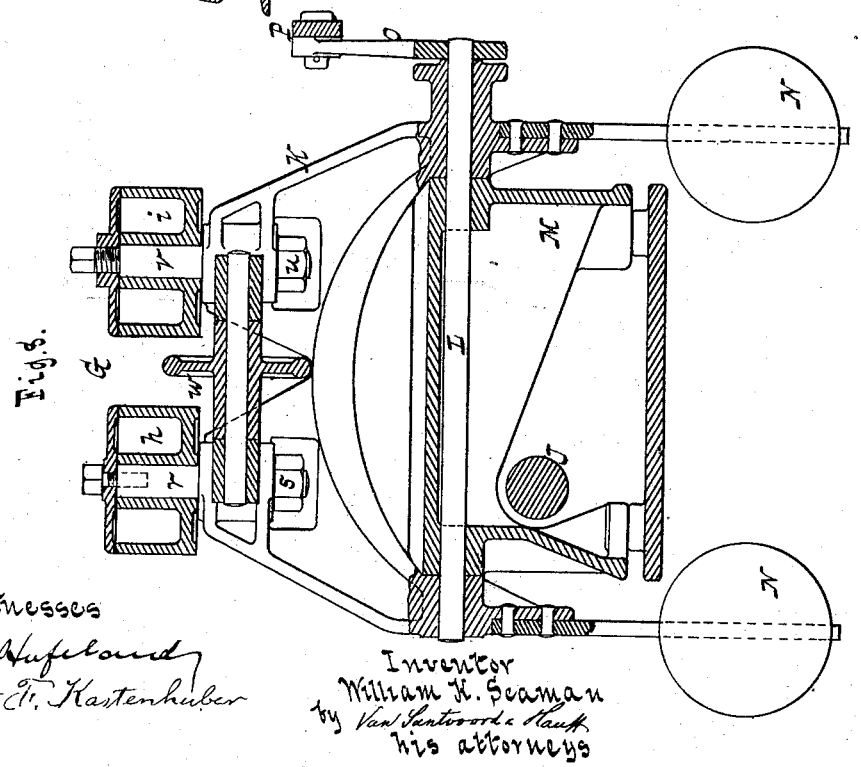

Fig. 8.

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Fig. 10.

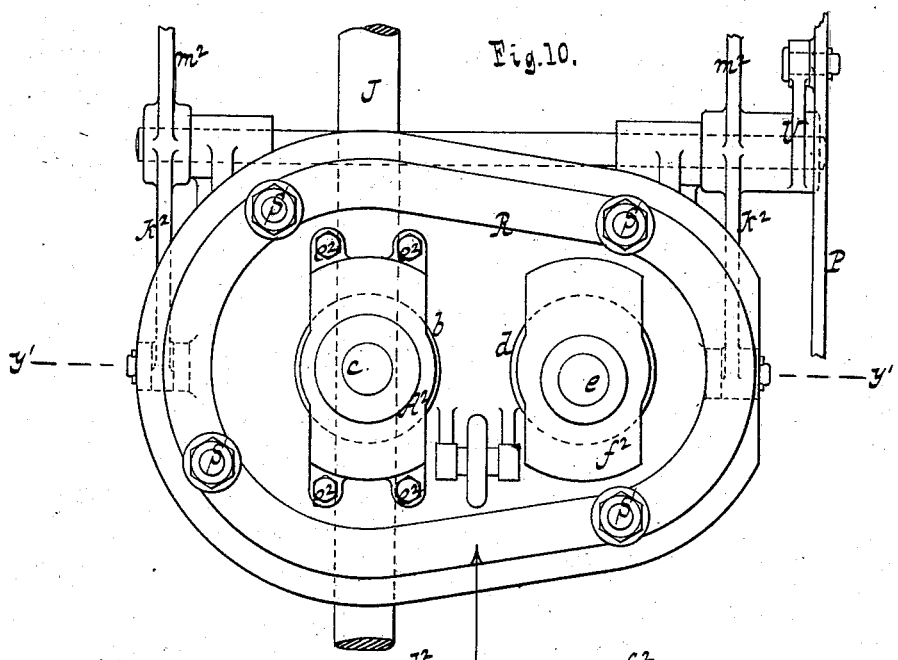
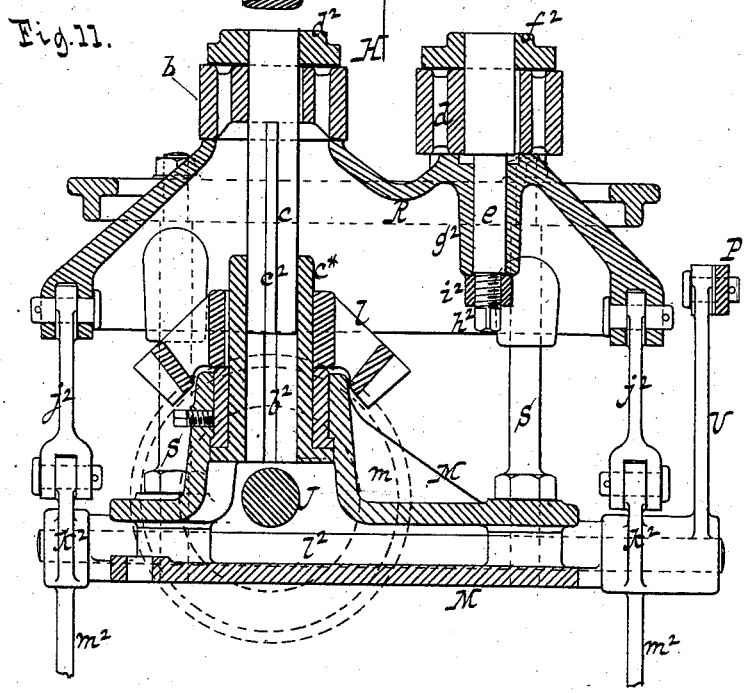


Fig. 11.



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MACHINERY FOR CARRYING, CUTTING, AND CAMBERING RAILROAD RAILS.

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Fig. 13.

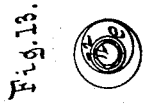

Fig. 14.

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UNITED STATES PATENT OFFICE.

WILLIAM K. SEAMAN, OF SCRANTON, PENNSYLVANIA.

MACHINERY FOR CARRYING, CUTTING, AND CAMBERING RAILROAD-RAILS.

SPECIFICATION forming part of Letters Patent No. 261,769, dated July 25, 1882.

Application filed March 21, 1882. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM K. SEAMAN, a citizen of the United States, residing at Scranton, in the county of Lackawanna and State of Pennsylvania, have invented new and useful Improvements in Machinery for Handling Railroad-Rails, of which the following is a specification.

This invention relates to certain improvements in the machinery used for carrying railroad-rails from the rolling-mill to the saws which cut off the ends, and thence through the cambering-machine to the hot-bed.

The various features which form the subject-matter of my invention are pointed out in the following specification.

In the accompanying drawings, Figure 1 represents a plan or top view of the entire apparatus, said figure being divided into Parts 1, 2, 3, and 4, and spread over three sheets. Fig. 2 is a side elevation of the primary hot-bed, with the tilting guide-rollers and the rising and falling grip-rollers, said figure being divided into Parts 1 and 2, and spread over two sheets. Fig. 3 is a plan or top view of the cambering-machine. Fig. 4 is a longitudinal vertical section of the same in the plane *x x*, Fig. 3. Fig. 5 is a transverse vertical section of the same in the plane *y y*, Fig. 3. Fig. 6 is an end view of the axle of the cambering-roller. Fig. 7 is an end view of the axle of one of the guide-rollers. Fig. 8 is a vertical section of the tilting guide-rollers in the plane *z z*, Fig. 9. Fig. 9 is an end view of the same, partly in section. Fig. 10 is a plan or top view of the rising and falling grip-rollers. Fig. 11 is a vertical section of the same in the plane *y' y'*, Fig. 10. Fig. 12 is an end view of the same, partly in section. Fig. 13 is an end view of the eccentric axle of one of the grip-rollers.

Similar letters indicate corresponding parts.

In the drawings, the letter A, Fig. 1, Part 1, designates the mouth of the switch which receives the rails from the finishing-roll, said switch being made to swing on the pivot *a*, so that its mouth can be adjusted to receive the rails from both finishing-passes of the roll. On the switch are secured a series of guide-rollers, B, which carry the rail to the first pair of grip-rollers, C, thence through the guide-rollers B' to the second pair of grip-rollers, C', thence through the guide-rollers B^2 to the third pair of grip-rollers, C^2, Fig. 1, Part 2, thence through the guide-rollers B^3 to the fourth pair of grip-rollers, C^3, Fig. 1, Part 3. While the rail is firmly retained by the grip-rollers C' C^2 C^3 its ends are cut off by the saws D, and when this has been accomplished the rail is passed on through the cambering-machine E to the first hot-bed, F.

By referring to Fig. 1, Part 4, it will be seen that in my apparatus a second hot-bed, F', is provided, and between the rails of the first hot-bed are placed the tilting guide-rollers G and the rising and falling grip-rollers H, (see Fig. 1, Parts 3 and 4, also Fig. 2, Parts 1 and 2,) while between the two hot-beds F and F' is placed a second cambering-machine, E'. This arrangement is desirable, because the rails can be finished by the rolls so rapidly that the hot-bed becomes full before the rails have time to cool, and if only one hot bed is provided, as in the apparatuses now in use, the rolling-mill cannot be worked to its full capacity. By providing two hot-beds, one in advance of the other, I am enabled to work the rolling-mill to its full capacity, and if the first hot-bed has become filled with rails I bring the tilting guide-rollers G and the rising and falling grip-rollers H into their working position, and the rails are carried on to the second hot-bed, thus giving time to cool to the rails on the first hot-bed.

Each pair of guide-rollers B consists of two rollers which turn loosely on their axles, and each pair of grip or forwarding rollers C consists of a roller which is fixed to its axis and a second roller which turns loosely on its axis.

In Fig. 8 I have shown a pair of guide-rollers. The roller *h* revolves freely on its axis *r*, which is fixed in its support by a nut, *s*, while the roller *i* revolves loosely on its axis *t*, which is secured in its support by a nut, *u*, and the portion *v* of this axis, which forms the bearing for the roller *i*, is eccentric, (see Fig. 9,) so that by turning the axle in its bearing said roller can be adjusted closer to or farther from the main roller *h*. By these means I am enabled to adjust the guide-rollers with the greatest nicety to correspond to the height of the rails passing through them, and at the same time the axles of said rollers remain parallel under all circumstances. Rollers *w* support the rails

as the same pass through between the guide-rollers.

Each pair of grip-rollers C consists of two rollers, *b d*, (see Figs. 3, 4, 5, 10, 11, and 12,) the roller *b* being mounted firmly on its axis, while the roller *d* turns loosely on an eccentric portion of its axis, so that by turning this axis in its bearings the distance between the rollers *b d* can be increased or diminished, while the two axles remain parallel. The bending-roll *j*, Figs. 3 and 4, is also mounted loosely on an eccentric portion of its axis *k*, so that it can be adjusted by turning said axis in its bearings. This bending-roll is combined with two pairs of grip-rolls, *b d*, *b′ d′*, (see Figs. 3 and 4,) and it is situated between the loose rollers *d d′*, Fig. 3. The axles *c c′*, *d d′*, and *k* of all these rollers have their bearings in a common frame, I, and on the axles *c c′*, which revolve in their bearings, are firmly mounted bevel-wheels *l l′*, which gear into corresponding bevel-wheels, *m m′*, mounted on the driving-shaft J. The rollers *d d′* turn loosely on eccentric portions of their axles, as already stated, and said axles are secured in the required position by the nuts *f*. The bending-roller *j*, as already stated, is mounted loosely on an eccentric portion of its axle *k*, (see Figs. 4 and 6,) and this axle is adjusted in the required position by a lever, *n*, and a clamping-screw, *o*, which engages with a slotted segment, *p*. The position of the axle *k* is such that by turning this axle the roller *j* can be thrown in advance of the rollers *d d′*, and the rail in passing through between the rollers *c d c′ d′* is bent or cambered to the required extent. By turning the axle *k* the amount of cambering can be determined with the greatest nicety, and the axles *k e e′* can be adjusted without throwing them out of parallelism with each other and with the axles *c c′* of the rollers *b b′*.

The tilting guide-rollers G, Figs. 1, 2, 8, and 9, are constructed precisely like the fixed guide-rollers C; but the support K of the axles *r t*, Figs. 8 and 9, is mounted on a shaft, L, so that said support, together with the guide-rollers *h i*, can be swung down beneath the surface of the hot-bed F, as indicated by dotted lines in Figs. 9 and 12. The shaft L has its bearings in the foundation M, which supports the bearings of the driving-shaft J and forms the support for all the working parts of my apparatus. The support K, together with the guide-rollers *h i*, is balanced by counter-weights N, and on the shaft L is mounted a lever, O, which is pivoted to a rod, P. By referring to Fig. 2 it will be seen that the rod P connects with the lever O of all the tilting guide-rollers G, and the end of said rod is pivoted to a lever, Q, Fig. 2, Part 1, which has its fulcrum on a pivot, a^2, secured in the foundation, so that by the action of this lever all the tilting guide-rollers can be swung down or up, as may be required.

The rising and falling grip-rollers H are shown in Figs. 10, 11, 12, and their position is indicated in Fig. 2, Part 2. The roller *b* is firmly mounted on its axle, which is telescopic, being made of the solid section *c* and the tubular section *c**, Fig. 11. This tubular section has its bearings in the foundation M, and on it is mounted the bevel-wheel *l*, which engages with a bevel-wheel, *m*, mounted on the driving shaft J. In the inner surface of the tubular section *c** is a groove, b^2, which engages with a feather-key, c^2, secured in the solid section *c*, so that this solid section is compelled to revolve with the tubular section, while it can be drawn in and out. The upper end of the solid section *c* has its bearing in a yoke, d^2, which is secured to the support R by screws e^2, Fig. 10, and the form of which is similar to the yoke f^2. (Shown in Fig. 12.) The axle *e* of the roller *d* has its bearing in a socket, g^2, in the support R, and its upper end is guided in the yoke f^2, which is cast solid with the support. (Best seen in Fig. 12.) The lower end of the axle *e* extends through the socket g^2, and is provided with a square, h^2, which serves to turn the axle for the purpose of adjusting the distance between the rollers *b d*. A nut, i^2, serves to fasten said axle in the required position. The support R is guided on posts S, which rise from the foundation M, and it connects by links j^2 with levers k^2, which extend from a rock-shaft, l^2, mounted in the foundation M. From this rock-shaft extend levers m^2, which carry counter-weights T to balance the support R, with its rollers, and on said rock-shaft is also mounted a lever, U, which connects with the rod P, Fig. 2. By moving the lever Q, which actuates the rod P, the support R, with its rollers, is raised or lowered, so that the grip-rollers H can be brought above the surface of the hot-bed F, if the rails are to be carried to the second hot-bed, F′.

By referring to Fig. 1, Parts 1, 2, 3, and 4, it will be seen that the driving-shaft J extends nearly throughout the entire length of my entire apparatus, and that motion is imparted to it by means of a single pair of bevel-wheels, n^2 o^2, Fig. 1, Part 3. From the driving-shaft motion is imparted directly to the axles *c* of all the fixed grip-rollers *b*, and if the axles *c* are accurately aligned when the machinery is erected, they, being supported in fixed bearings, necessarily remain in alignment, thereby forming a rigidly-straight guide for the moving rails. Furthermore, by driving the axles *c* directly from the shaft J each by a single pair of bevel-gears much of the line and transverse shafting made necessary by existing arrangments of the driving-engine and attendant mechanism is done away with, the cost of the apparatus is materially reduced, and its operation simplified. A large portion of this simplification is due to the fact that in my apparatus the adjustable rollers *d* run loosely on their axles and require no driving mechanism. By providing a second hot-bed, F′, the rolling-mill can be run to its full capacity, and ample time is given to the rails to cool.

Of course when the second hot-bed is used

the rollers of the cambering-machine F are so adjusted that they simply act as forwarding-rollers.

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

1. In machinery for handling railroad-rails, the combination of a series of guide-rolls, B B' B^2, a series of grip or forwarding rollers, C C' C^2, a cambering-machine, E, and a driving-shaft which is directly geared together with the axle of the fixed roller of each pair of grip or forwarding rollers, substantially as and for the purpose set forth.

2. The combination, substantially as herein-before described, with a horizontal shaft, J, of a series of vertical axles arranged in pairs, one axle in each pair carrying a fixed roller and being mounted in fixed bearings and geared to the horizontal shaft, while the other axle of each pair has an eccentric portion and can be turned in its bearings, a roller mounted loosely on the eccentric portion of this axle, and a nut or equivalent device for securing the axle in the required position.

3. The combination, substantially as herein-before described, with a horizontal shaft, J, of two pairs of vertical axles arranged in pairs, one axle of each pair carrying a fixed roller, and being mounted in fixed bearings and geared to the horizontal shaft, while the second axle in each pair has an eccentric portion and can be turned in its bearings, a roller mounted loosely on each of these second axles, a nut or equivalent device for securing each of these second axles in the required position, and a bending-roller situated between and slightly in advance of these loose rollers.

4. The combination, substantially as herein-before described, of two pairs of grip-rollers, *b b'* and *d d'*, an axle, *k*, journaled in bearings intermediate said rollers, and provided with an eccentric portion, a bending-roller, *j*, mounted loosely on the eccentric portion, and means for adjusting the axle and its roller in the required position, substantially as described.

5. The combination, substantially as herein-before described, of a series of guide-rollers and grip or forwarding rollers, two hot-beds, F F', one in advance of the other, additional guide-rollers and grip or forwarding rollers situated between the rails of the first hot-bed, F, and means for moving these additional guide-rollers and grip or forwarding rollers above or below the level of said hot-bed.

6. The combination, substantially as here-inbefore described, of a series of guide-rollers and grip or forwarding rollers, two hot-beds, F F', one in advance of the other, additional guide-rollers and grip or forwarding rollers, situated between the rails of the first hot bed, F, and mounted in movable supports, levers O O U, connected to these supports, a rod, P, connected to all these levers, and the lever Q for actuating the rod P.

7. The combination, substantially as herein-before set forth, of the guide-rollers *h i*, the support K, which forms the bearings for the axles of said guide-rollers, the rock-shaft L, on which is mounted the support K, and the lever O for swinging the support, together with the guide-rollers, up or down.

8. The combination, substantially as here-inbefore set forth, of the grip or forwarding rollers *b d*, the telescopic axle of the roller *b*, the axle *e* of the roller *d*, the support R, the posts S, which form guides for the support, and mechanism for raising and lowering said support together with the rollers *b d*.

In testimony whereof I have hereunto set my hand and seal in the presence of two subscribing witnesses.

WM. K. SEAMAN. [L. S.]

Witnesses:
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E. F. KASTENHUBER.