(No Model.)

J. & H. R. HOWARD.

CAR BRAKE.

No. 485,385. Patented Nov. 1, 1892.

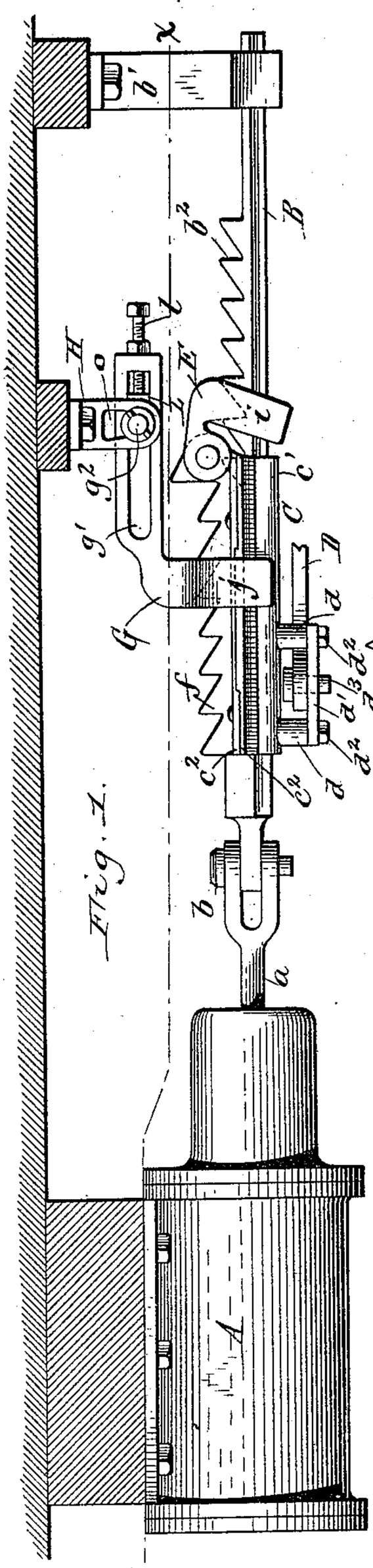

Fig. 1.

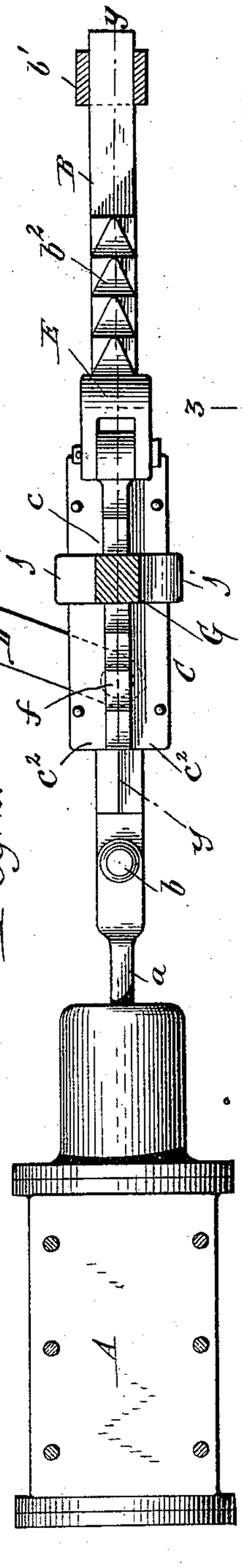

Fig. 2.

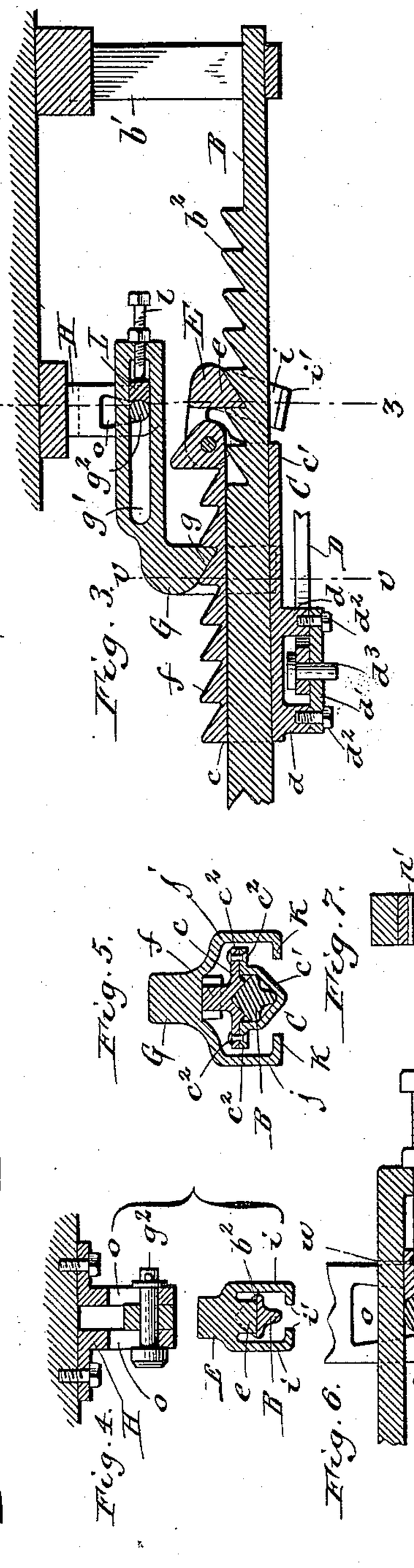

Fig. 3.

Fig. 5.

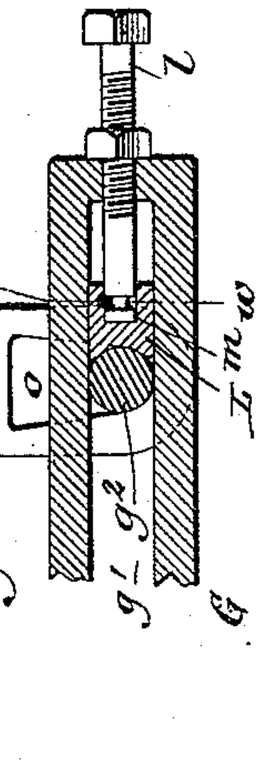

Fig. 7.

Fig. 4.

Fig. 6.

Witnesses:
Emil Neuhart.
Theo. L. Popp.

James Howard
Herbert R. Howard } Inventors.
By Wilhelm & Bonner. Attorneys.

UNITED STATES PATENT OFFICE.

JAMES HOWARD AND HERBERT RUSSELL HOWARD, OF NEW YORK, N. Y.

CAR-BRAKE.

SPECIFICATION forming part of Letters Patent No. 485,385, dated November 1, 1892.

Application filed June 13, 1892. Serial No. 436,458. (No model.)

To all whom it may concern:

Be it known that we, JAMES HOWARD and HERBERT RUSSELL HOWARD, citizens of the United States, residing at New York, in the county and State of New York, have invented new and useful Improvements in Power-Brakes for Railway-Cars, of which the following is a specification.

This invention relates to power-brakes for railway-cars which automatically take up any slack or wear in the brake-gearing, and more particularly to the brake take-up mechanism which forms the subject of Letters Patent of the United States No. 458,807, granted to us September 1, 1891.

The object of our invention is to improve the construction and operation of this take-up mechanism in various respects.

In the accompanying drawings, Figure 1 is a side elevation of a brake-gearing provided with our improvements. Fig. 2 is a top plan view of the same, partly in section, taken in line *x x*, Fig. 1. Fig. 3 is a vertical longitudinal section of the take-up mechanism in line *y y*, Fig. 2. Figs. 4 and 5 are vertical transverse sections in lines *z z* and *v v*, Fig. 3. Fig. 6 is a fragmentary longitudinal section of the rear portion of the detent-pawl and connecting parts, on an enlarged scale. Fig. 7 is a vertical transverse section in line *w w*, Fig. 6.

Like letters of reference refer to like parts in the several figures.

A represents the brake-cylinder, which is secured in a horizontal position to the under side of the car and provided with a piston having a piston-rod *a* passing through one end of the cylinder.

B represents the horizontal ratchet-bar, which is secured at its front end to the piston-rod by a pin *b* and supported at its rear end in a loop *b'*, secured to the under side of the car. The upper side of the ratchet-bar is provided near its rear end with a row of ratchet-teeth b^2, having inclined front sides and abrupt rear sides.

C represents the sliding block, which is mounted on the ratchet-bar and surrounds the same. This block is preferably composed of an upper section *c* and a lower section *c'*, both provided on opposite sides with longitudinal flanges c^2, which are secured together by rivets.

D represents the main brake-lever, which is connected at one end with the sliding block and at the other with the brake-shoes by intermediate mechanism of any suitable and well-known construction. The actuated end of the brake-lever is arranged between two lugs *d*, depending from the sliding block, and rests upon a supporting-plate *d'*, which is secured to the under side of the lugs *d d* by bolts d^2. The brake-lever is connected with the supporting-plate by a pin d^3, resting with its head upon the brake-lever and having its head arranged so closely to the under side of the sliding block that the pin is prevented from being raised and disengaged from the brake-lever and supporting-plate by the jarring of the car. The pin is inserted into the brake-lever and supporting-plate before the latter is secured to the lugs of the sliding block. As the pin is arranged in the central vertical plane of the sliding block and ratchet-bar, the strain is applied centrally to the sliding block and ratchet-bar.

E represents the connecting-pawl, whereby the sliding block is connected with or held in position upon the ratchet-bar. This pawl is pivoted with its front end upon the rear end of the sliding block and is provided at its rear end with a hook *e*, which engages with the teeth of the ratchet-bar. The upper side of the sliding block is provided with a row of teeth *f*, having abrupt front sides and inclined rear sides.

G represents the detent-pawl, whereby the slack in the brake-gearing is taken up which may arise from the wear of the brake-shoes or other causes. This detent-pawl is provided at its depending front end with a hook *g*, which engages with one of the teeth *f* on the sliding block and in its elevated rear portion with a longitudinal slot *g'*. The latter receives a transverse pin g^2, which is supported in hangers H, secured to the under side of the car.

During the outward and return movements of the piston in the brake-cylinder the brake-lever is correspondingly moved through the medium of the sliding block and the connecting-pawl connecting the sliding block

with the ratchet-bar, thereby applying the brake-shoes to the wheels and releasing the same therefrom. When the brake-shoes are in a normal condition, the connecting-pawl remains immovably in engagement with the ratchet-bar, the hook of the detent-pawl remains in engagement with the sliding block, and the detent-pawl slides by means of the slot on its supporting-pin without touching the latter with the ends of the slot. When slack has been formed in the brake mechanism by wear of the brake-shoes or otherwise, the front end of the slot in the detent-pawl strikes the supporting-pin during the last portion of the outward movement of the piston, whereby the sliding movement of the detent-pawl is arrested, while the sliding block, continues to move with the piston, thereby causing the detent-pawl to ride over one of the teeth in the sliding block and engage with the next tooth in front of the same. During the return movement of the piston the sliding block and detent-pawl are carried along with the piston until the rear end of the slot in the detent-pawl strikes the supporting-pin g^2. This arrests the backward movement of the detent-pawl and of the sliding block connected therewith, which causes the connecting-pawl to ride over the next rearward tooth on the ratchet-bar during the continued return movement of the latter with the piston, thereby taking up the slack in the brake-gearing.

The return movement of the sliding block, with the piston, when the parts are in their normal condition is dependent solely upon the weight of the connecting-pawl, which holds the latter in engagement with the teeth of the ratchet-bar. In order to hold this pawl firmly in engagement with the teeth of the ratchet-bar when the brake-gearing is in its normal condition, the pawl is provided on opposite sides of its free end with depending wings or weights i, which straddle the ratchet-bar and extend downwardly below the same, thereby increasing the weight of the pawl. The lower ends of the wings of this pawl are provided with stops i', which project inwardly underneath the ratchet-bar and are adapted to strike against the under side of the ratchet-bar to limit the upward movement of the detent-pawl, thereby preventing the pawl from being lifted so high by the shocks which the car may receive as to become disengaged from the teeth of the ratchet-bar. The hook of the upper or detent pawl is likewise provided on opposite sides with depending wings or weights j, which extend downwardly below the flanges of the sliding block and are provided with inwardly-projecting stops $k\,k$, which are adapted to strike the under side of the flanges on the sliding block, and so limit the upward movement of the trip-pawl hook and prevent the pawl from being raised out of engagement with the teeth of the block.

In order to permit the point to be adjusted at which the return movement of the detent-pawl is arrested to take up the slack or wear of the brake-shoes, an adjustable bearing-piece L is arranged in the slot of the detent-pawl in rear of the supporting-pin g^2. This bearing-piece is adjusted by a screw l, arranged in the rear end of the detent-pawl and having its front end connected with the bearing-piece by a swiveling connection composed of a socket m, groove n, and pin n' or of other suitable construction, which permits the screw to turn and compels the bearing-piece to move lengthwise with the screw.

When the detent-pawl is arranged closely to the underside of the car, it is liable to bind on its supporting-pin when its hook is raised. In order to prevent the detent-pawl from binding, the hangers H are preferably provided with vertical slots o, which receive the end portions of the supporting-pin g^2. These slots are preferably flared upwardly and permit the supporting-pin to rise vertically with the detent-pawl and avoid any cramping action.

We claim as our invention—

1. The combination, with the ratchet-bar, the sliding block, and the brake-lever connected with the sliding block, of a pawl connecting the sliding block with the ratchet-bar and provided with a bifurcated or divided weight or wing which straddles the ratchet-bar, substantially as set forth.

2. The combination, with the ratchet-bar, the sliding block, and the brake-lever connected with the sliding block, of a pawl pivoted to the sliding block and engaging with the ratchet-bar and having a depending wing formed with a stop, which extends underneath the ratchet-bar, substantially as set forth.

3. The combination, with the ratchet-bar, the sliding block provided with a flange and a row of teeth, the pawl connecting the sliding block with the ratchet-bar, and the brake-lever connected with the sliding block, of a detent-pawl engaging with the teeth of the sliding block and formed with a depending wing having a stop, which extends underneath said flange, substantially as set forth.

4. The combination, with the ratchet-bar, the sliding block, the pawl connecting the sliding block with the ratchet-bar, and the brake-lever, of a detent-pawl engaging with the sliding block and having a longitudinal slot and an adjustable bearing-piece, whereby the effective length of the slot can be regulated, and a supporting-pin passing through said slot, substantially as set forth.

5. The combination, with the ratchet-bar, the sliding block, the pawl connecting the sliding block with the ratchet-bar, and the brake-lever, of a detent-pawl engaging with the sliding block and having a longitudinal slot, an adjustable bearing-piece arranged in said slot, an adjusting-screw arranged in the detent-pawl and connected with the bearing-piece, and a supporting-pin passing through said slot, substantially as set forth.

6. The combination, with the ratchet-bar, the sliding block, the pawl connecting the sliding block with the ratchet-bar, and the brake-lever, of a detent-pawl engaging with the sliding block and having a slot on its rear end, a transverse supporting-pin arranged in said slot, and hangers provided with vertical slots which receive the ends of said pin, substantially as set forth.

7. The combination, with the ratchet-bar and the brake-lever, of a sliding block connected with the ratchet-bar and provided on its under side with depending lugs, between which the brake-lever is arranged, and a plate secured to said lugs and supporting the brake-lever, and a pin connecting the brake-lever with said plate, substantially as set forth.

Witness our hands this 7th day of June, 1892.

JAMES HOWARD.
HERBERT RUSSELL HOWARD.

Witnesses to the signature of James Howard:

JNO. J. BONNER,
FRED. C. GEYER.

Witnesses to the signature of Herbert Russell Howard:

J. H. WARD,
E. JACOBEITZ.