(No Model.)

2 Sheets—Sheet 1.

P. HANSON.

AUTOMATIC CAR BRAKE.

No. 324,375. Patented Aug. 18, 1885.

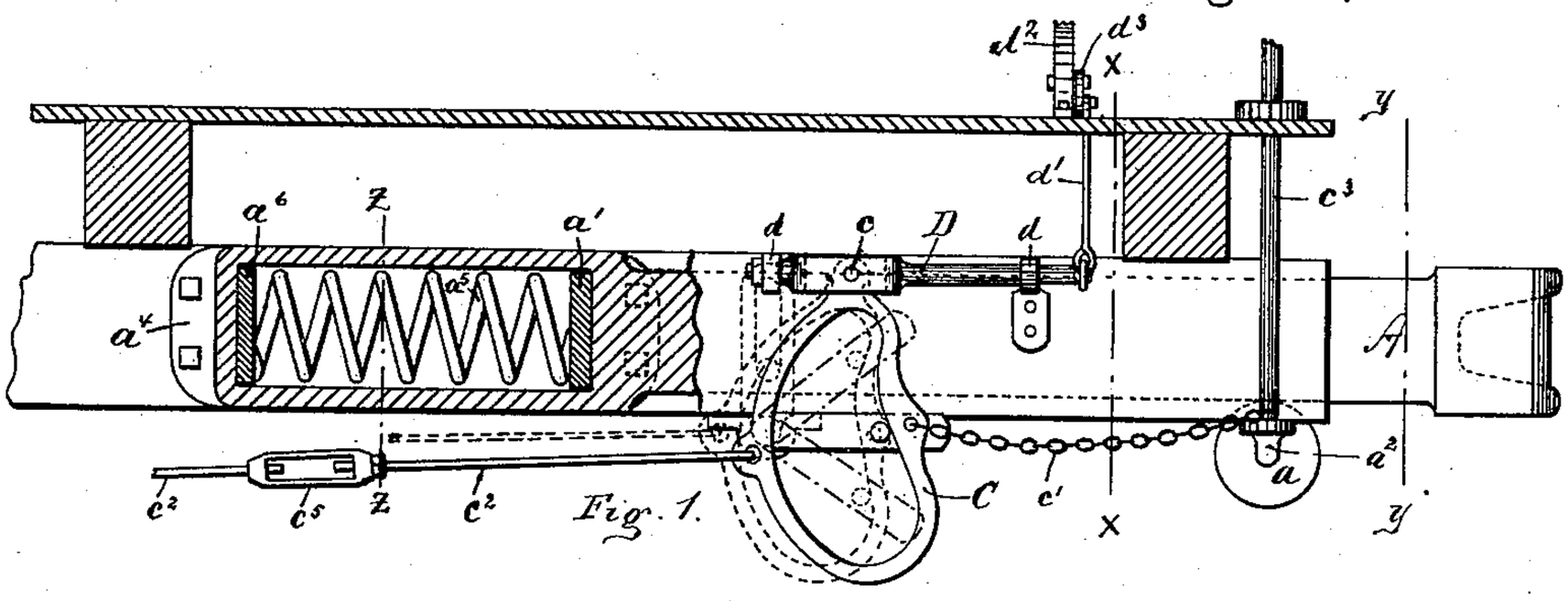

Fig. 1.

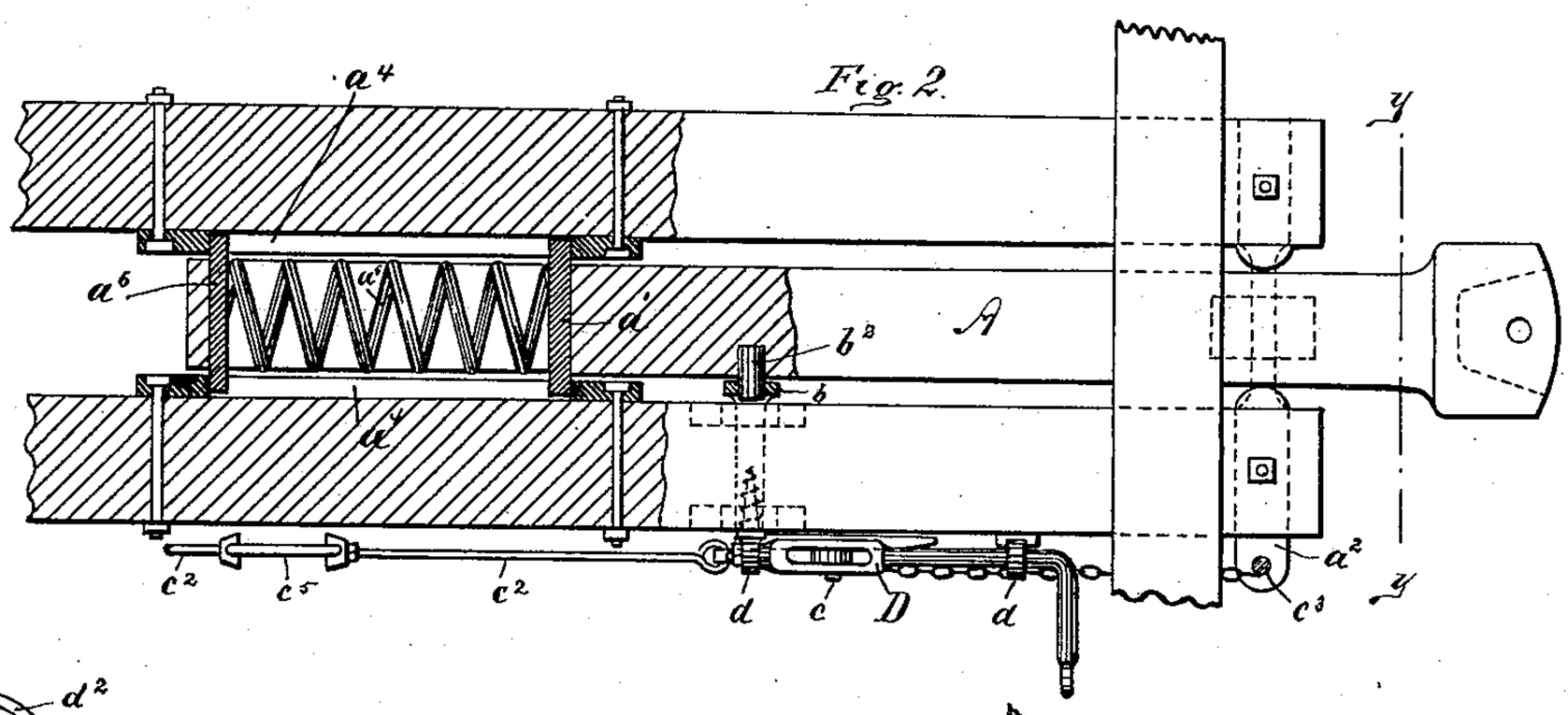

Fig. 2.

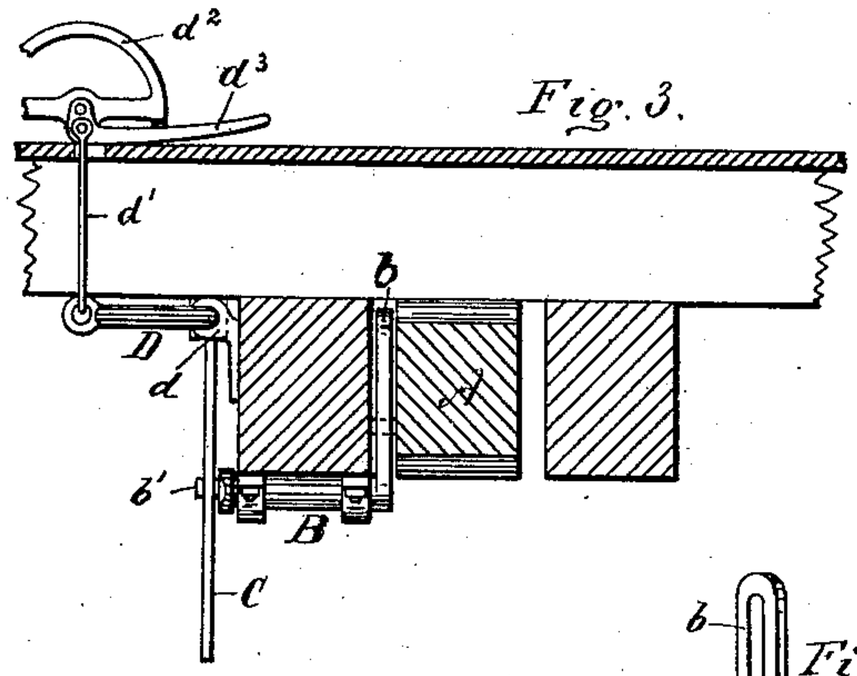

Fig. 3.

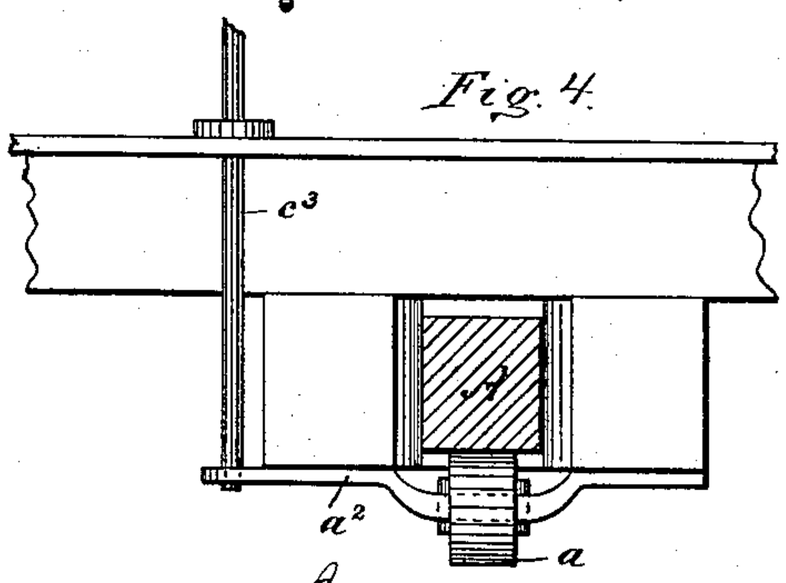

Fig. 4.

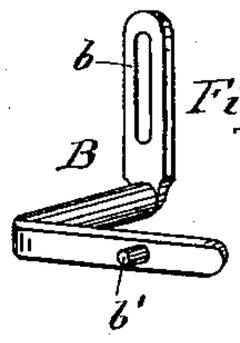

Fig. 6.

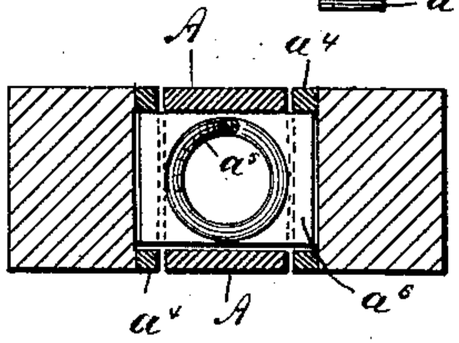

Fig. 5

Witnesses:
L. Holmboe
W. M. Sherwood

Inventor.
Paul Hanson
by Burton Fisher
Attorneys.

(No Model.) 2 Sheets—Sheet 2.

P. HANSON.

AUTOMATIC CAR BRAKE.

No. 324,375. Patented Aug. 18, 1885.

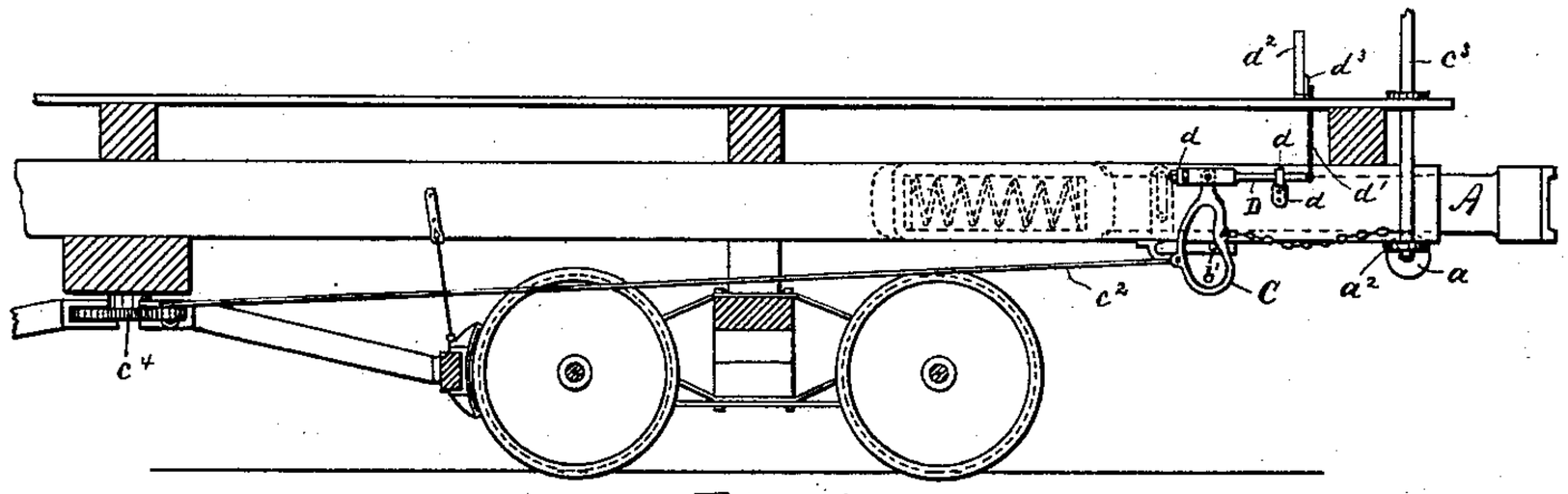

Fig. 7.

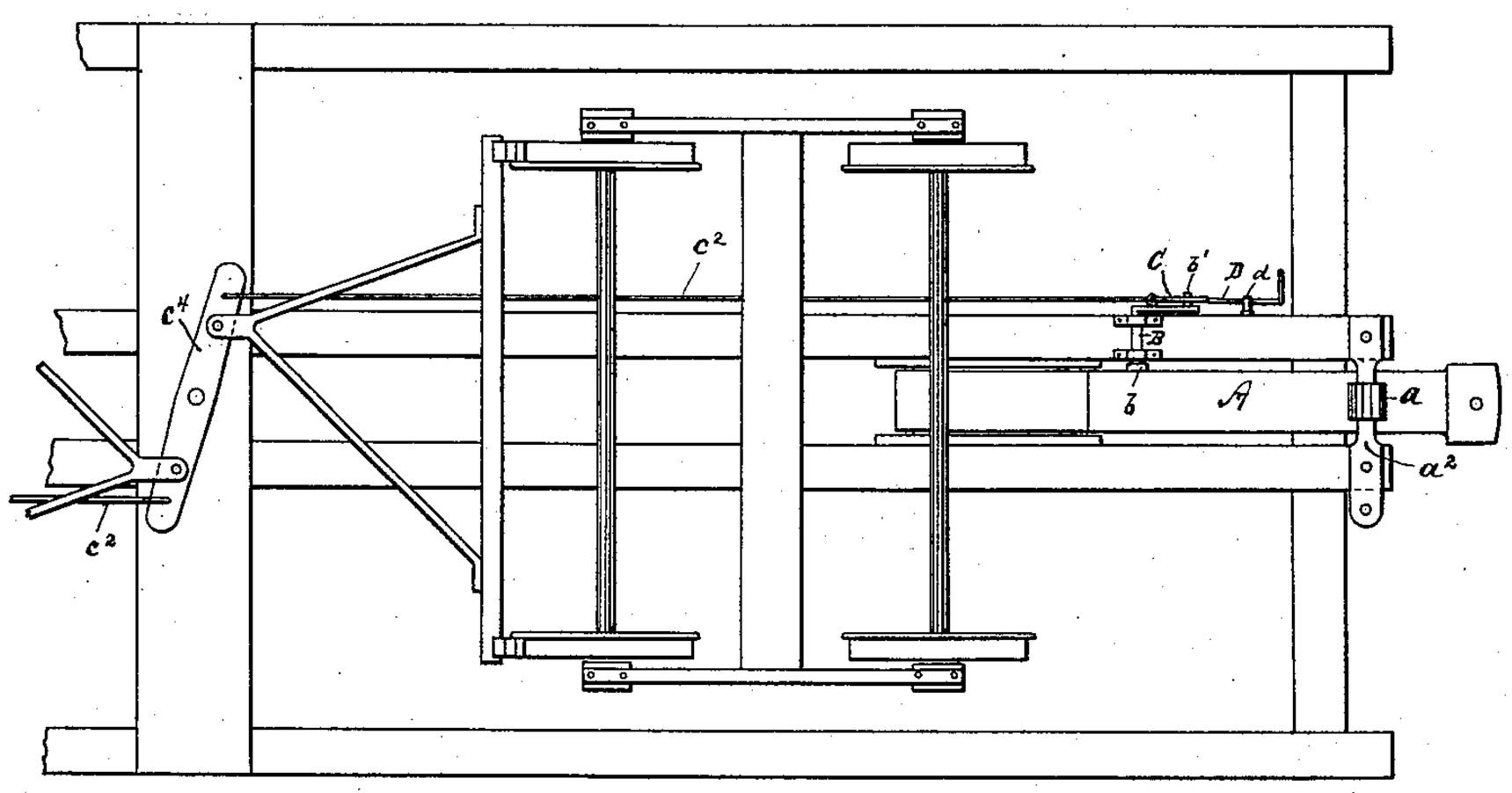

Fig. 8.

Witnesses:
L. Holmboe.
W. M. Sherwood

Inventor
Paul Hanson

by Peirce & Fisher
Attorneys.

UNITED STATES PATENT OFFICE.

PAUL HANSON, OF ST. PAUL, MINNESOTA.

AUTOMATIC CAR-BRAKE.

SPECIFICATION forming part of Letters Patent No. 324,375, dated August 18, 1885.

Application filed January 8, 1885. (No model.)

To all whom it may concern:

Be it known that I, PAUL HANSON, a resident of St. Paul, county of Ramsey, State of Minnesota, have invented certain new and useful Improvements in Automatic Car-Brakes; and I do hereby declare the following to be a full, clear, and exact description of my invention, sufficient to enable others skilled in the art to make and use the same.

My invention relates to car-brakes which are automatically set or put in operation as the rate of motion of the train is slackened.

The invention consists, generally, in connecting the sliding draw-bar of the car with the brake-rod, or like device, for operating the usual brake mechanism, by means of an oscillating crank-arm and a cam-lever located between said draw-bar and brake-rod, respectively, and coacting therewith to effect the setting of the brakes by the movement of the draw-bar.

The invention also provides for disconnecting the parts in such wise that the motion of the draw-bar is no longer transmitted to the brake mechanism proper, by which expedient the brakes cease to be set automatically, although still under control through the usual winding-post and chains.

The invention further consists in certain improvements in details of structure, the nature of all of which will be fully set forth in description and be thereafter distinctly pointed out in the claims following.

In the accompanying drawings, forming part of this specification, like letters of reference denote like parts throughout.

Figure 1 is a side elevation (the bottom of the car in section) showing the draw-bar, crank-arm, cam-lever, brake-rod, and adjuncts in set position. Fig. 2 is a plan view (partly in section) with the bottom of the car removed, exhibiting the draw-bar, &c., in relation as in Fig. 1. Figs. 3, 4, and 5 are transverse sections on lines *x x*, *y y*, and *z z*, Figs. 1 and 2, respectively. Fig. 6 is a perspective view of the crank-arm detached; Fig. 7, a general view in side elevation (partly in section) of the car having the brake mechanism attached thereto; Fig. 8, a reverse plan view of the car, Fig. 7.

The draw-bar A, of usual construction for linking adjacent cars together, is mounted centrally beneath the main frame-work of the car, and is supported near its front end upon the roller *a*, while near its back end, which is recessed, said bar encompasses and is supported upon the sliding plates a' a^6. The roller *a* journals upon the strap-iron a^2, secured, as shown, to the longitudinal beams, and serves to reduce the frictional contact of the heavy draw-bar, so that said bar may move back and forth with greater facility. The sliding plates a' a^6 are sustained by and move in ways formed in the parallel guides a^4, attached to the car-beams. A heavy coil-spring, a^5, mounted within the recess of the draw-bar A, and bearing against the slide-plates a' a^6, serves normally to keep said plates apart at the extreme ends of the ways, in which position the draw-bar will stand at rest. If, however, the draw-bar be either pulled outward or thrust inward, the plate a' or a^6, as the case may be, next against the abutting face of the recess in the bar, will be advanced in the ways, compressing the spring a^5, which latter will return said plate, together with the bar, to position, when the pull or thrust (sufficient to overcome the spring tension) is no longer exerted.

Journaled, as shown, to one of the longitudinal car-beams is the oscillating crank-arm B, having the slotted end *b*, adapted to engage with a pin, b^2, or the like, projecting from the draw-bar A. The opposite end of the crank-arm B conveniently, by the stud b', engages the cam-like face of a bifurcated pendent lever, C, which lever is pivotally sustained, as at *c*, from the radius-bar D. Said radius-bar is preferably recessed, as shown, to securely receive the pivot end of lever C, and is mounted in journal-bearings, as at *d*, which bearings are fastened to the adjacent car-beam or like convenient support.

At opposite sides of the cam-lever C the brake-chain c' and brake-rod c^2 are attached, leading thence, respectively, to the usual winding-post, c^3, and to the brake-beam c^4, or other ordinary form of brake mechanism. It thus appears that the pendent cam-lever is practically an additional element of structure interposed between the usual brake-chain and brake-rod, and serving (among other purposes) as a link or connection to join them together.

The winding-post c^3 may be stepped, if de-

sired, in the strap-iron a^2, as shown, while the turn-buckle c^5, having suitable jam-nut, is designed to adjust the length of the divided brake-rod c^2 in operative relation to the cam-lever C and to the brake mechanism. The crank end of radius-bar D is connected by link d' with the eccentric hand-lever d^3, which locks at will into the arc-rack d^2, mounted upon the car platform or roof, or other convenient place. When the car is at rest, no pull or thrust being exerted on the draw-bar A, the parts stand in normal position, as indicated by full lines, Figs. 1 and 2. At this juncture the tension of draw-bar spring a^5 is exerted, through stud b^2 of the draw-bar, the crank-arm B, cam-lever C, and brake-rod c^2, to slightly set the brakes, the turn-buckle c^5 being capable of adjustment to effect such result. If the train starts ahead, the draw-bar A is pulled out, oscillating the crank-arm B, so that the stud b' thereof is turned downward and away from the cam-face of lever C, thus slackening the strain on the brake-rod c^2 and releasing the brakes.

It is obvious that the power necessary to relieve the brakes is merely that which will overcome the tension of spring a^5 in pulling upon the draw-bar A. On suddenly arresting the speed of the train, the draw-bar A first returns to normal position, allowing the spring a^5 to act again in setting the brakes by contact of stud b' with cam-lever C. If the check to the movement of the train still continues, the draw-bar is forced inward beyond the normal, causing the stud b' to ride farther up the incline of cam-lever C, and thus setting the brakes tighter and tighter. Should a retrograde movement of the train be finally established, the draw-bar A will be at the extreme of its inward thrust, so far oscillating the crank-arm B that the stud b' will rise away from cam-lever C, and the brakes be released precisely as when the train was advancing. On slowing up the backward movement, the spring a^5 thrusts the draw-bar forward toward the normal, reversely oscillating the crank-arm B, and forcing the stud b' thereof to ride down against the cam-face of lever C, setting the brakes as before, and finally bringing the train at rest. Whether the train proceeds backward or forward, it thus appears that whenever the rate of motion is slackened the tension of draw-bar spring a^5 comes into play to effect the setting of the brakes, while in checking the advance movement (which is most frequent) the action of the spring is further supplemented by the incline given to the cam-face of lever C.

In making up trains or in taking a flying switch, and at other times, it becomes desirable to have the cars under control of the brakeman stationed at the ordinary winding-post, so that the brakes for each car may be separately set or released, as desired. Provision for this appears in the construction of the radius-bar D, to which the cam-lever C is pivoted. By throwing the eccentric lever s^3 over from its position shown in Figs. 1, 2, and 3, the link s' thereof raises the crank-arm of the radius-bar, rotating the latter, and thereby lifting the cam-lever C out and away from contact with stud b' of the crank-arm B. The lever C is accordingly disconnected from the automatic action of the draw-bar, and yet, through the winding-post c^3, it controls the brake-rod c^2 to set or release the brakes as usual. It will be noted that the mere setting of the brakes can be effected as well whether the lever C is in or out of engagement with the pin b' of the automatic mechanism, for when thus engaged the shortening of the brake-chain c' about the winding-post c^3 draws the lever C forward and away from the pin b', thus setting the brakes even tighter than the automatic movement of the draw-bar alone would accomplish; but if the purpose is to wholly release the brakes, this cannot be done ordinarily while the lever C is within the path of the pin b', since said pin contacts with and arrests the lever before the release is fully effected; hence it is that the provision for disconnecting the lever C from automatic control is more particularly with a view to entire freedom in releasing the brakes when this becomes desirable.

By the construction of parts detailed it is evident that the brakes of the train are capable of being set automatically either during the forward or backward movement, and that at will any one or more of the cars may be released from the automatic action and be controlled wholly by the brakeman in the ordinary way. If the train should break apart on a downgrade, the draw-bar of the front car in the detached section would be pulled inward by action of its springs, setting the brakes of the car and diminishing its speed. The advance of the remaining cars being thus obstructed, these will run together, releasing the draw-bars from strain, which thereupon move inward, setting the brakes for each car. If a break should occur on an upgrade, the brakeman in the caboose or rear car, either before or after disengaging the lever C from the automatic system, could operate the winding-post and set the brakes as usual. Immediately the other cars would gain in speed as compared with the car under check, and, running together, would throw on the brakes of each car automatically, as explained.

It is manifest that the details of structure hereinbefore set forth may be widely varied without departing from the spirit of my invention.

Having thus described the invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination, with the draw-bar and with the brake mechanism proper, of the crank-arm and the cam-lever co-operating with each other and with said bar and mechanism, respectively, to control automatically the setting of the brakes, substantially as described.

2. The combination, with the spring draw-

bar having roller-bearing, of the cam-lever, the crank-arm intermediate said bar and lever and engaging the same, and the brake-rod and beam, substantially as described.

3. The combination, with the winding-post and chain and with the brake-rod, of a pivoted lever connecting the same, said lever being directly and detachably joined to the automatic mechanism for setting the brakes by movement of the draw-bar, substantially as described.

4. The combination, with the spring draw-bar having pin b^2, of the crank-arm B, having slotted end b to engage said pin, the cam-lever C, bearing against a stud of the crank-arm B, the brake-rod c^2, and brake-beam, substantially as described.

5. The combination, with the pendent lever C, of the radius-bar D and means, substantially as described, to rotate the same in its bearings, substantially as set forth.

6. The combination, with the lever C and with the brake-beam, of the brake-rod adjustably joining the same together, substantially as described.

7. The combination, with the spring draw-bar, the crank-arm, and the cam-lever, of the brake-rod adjustably joining said lever to the brake-beam, substantially as described.

PAUL HANSON.

Witnesses:
GEO. P. FISHER, Jr.,
JAMES H. PEIRCE.