

No. 640,921.

Patented Jan. 9, 1900.

C. A. KRUSE.

CAR BRAKE.

Application filed Nov. 6, 1899.)

(No Model.)

2 Sheets—Sheet 1.

Fig: 1.

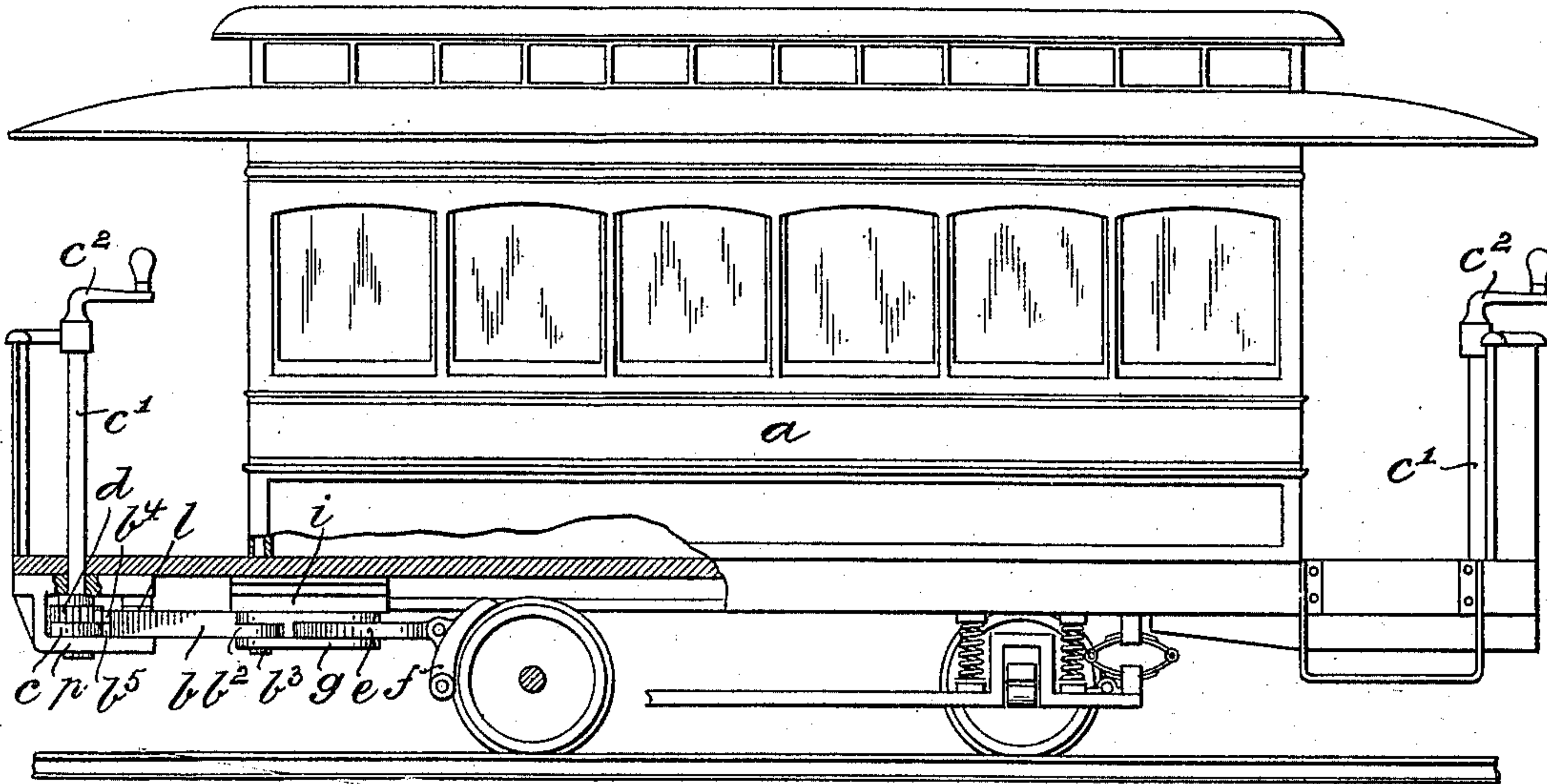
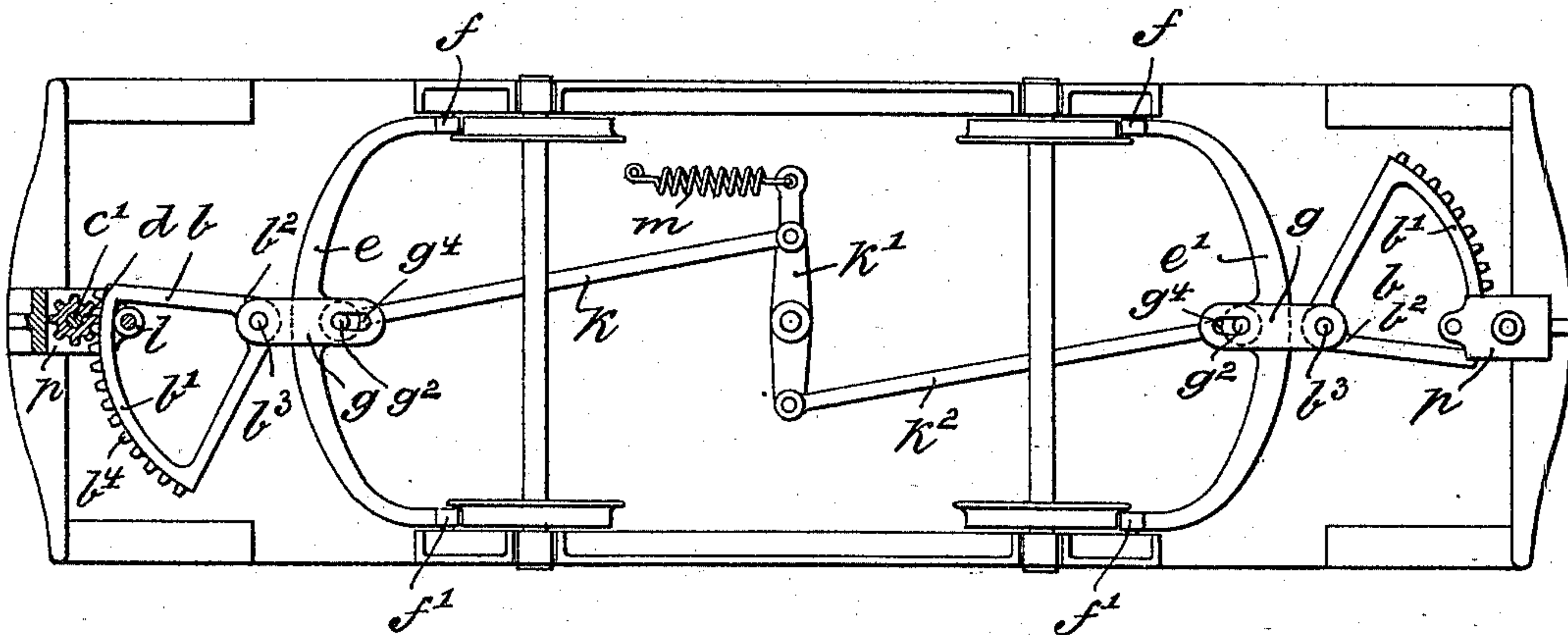


Fig: 2.



Witnesses:
Thomas M. Smith.
Richard C. Mapell

Inventor:
Charles A. Kruse,
by J. Walter Dugan
Attorney.

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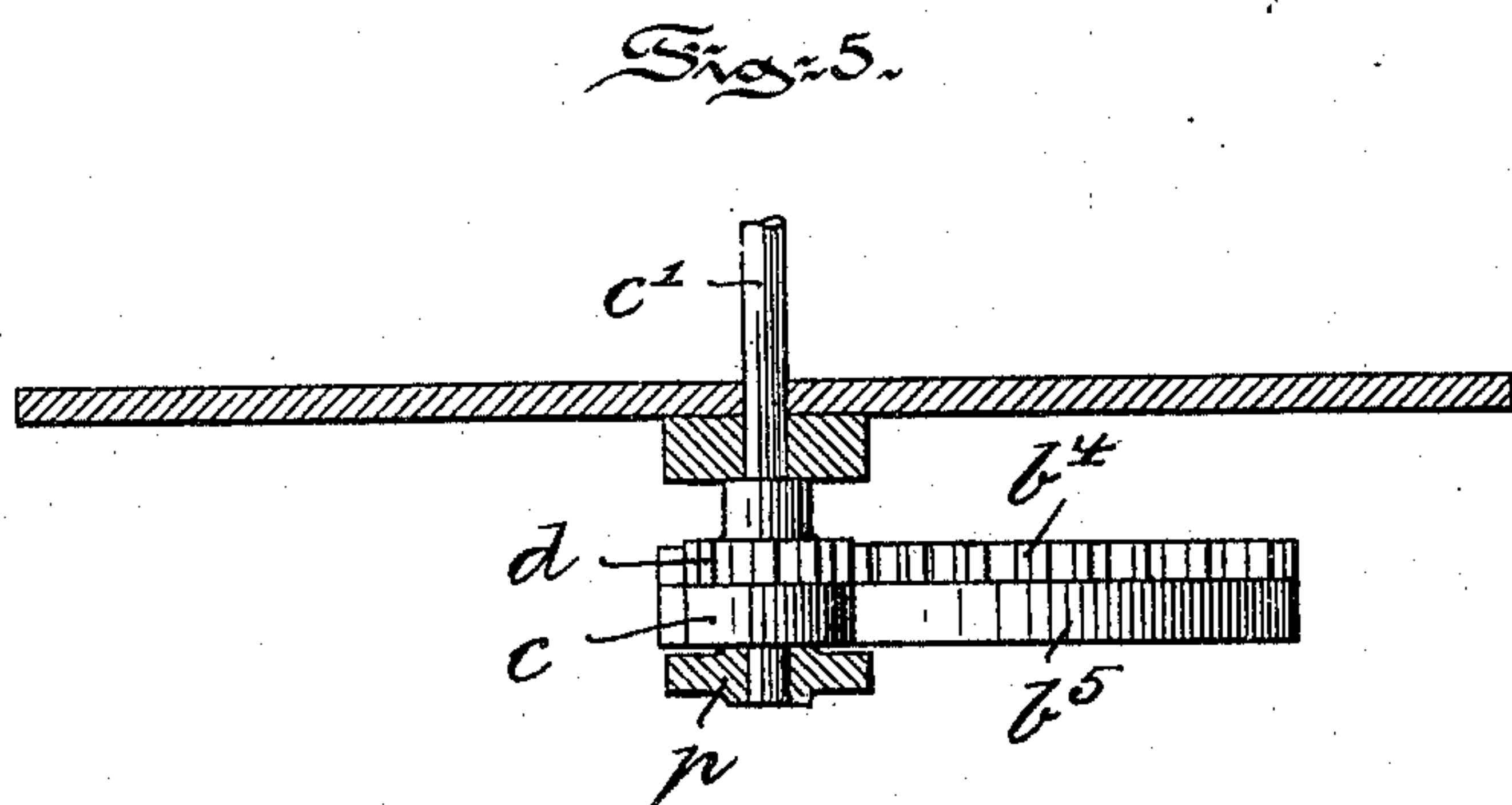
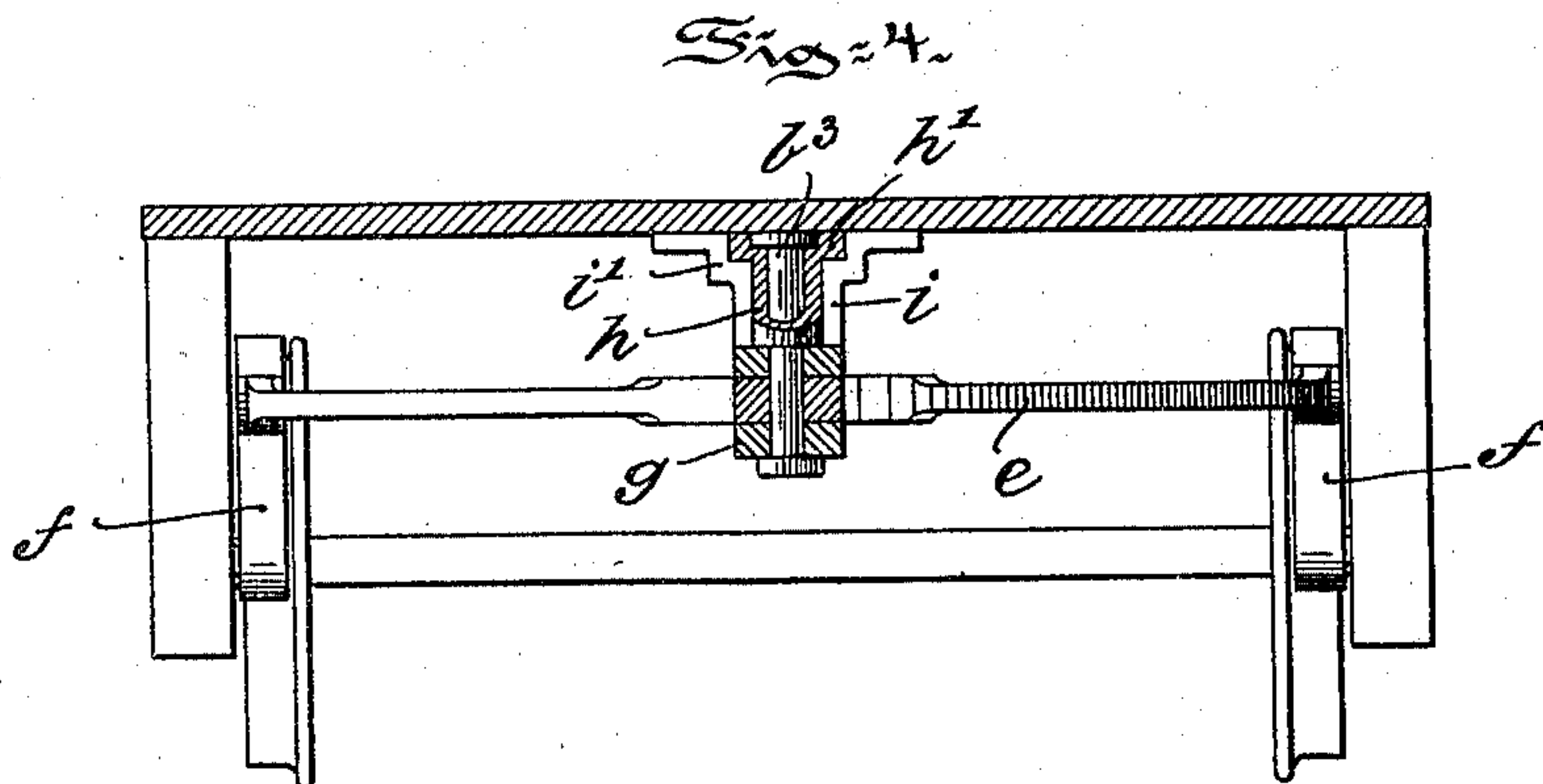
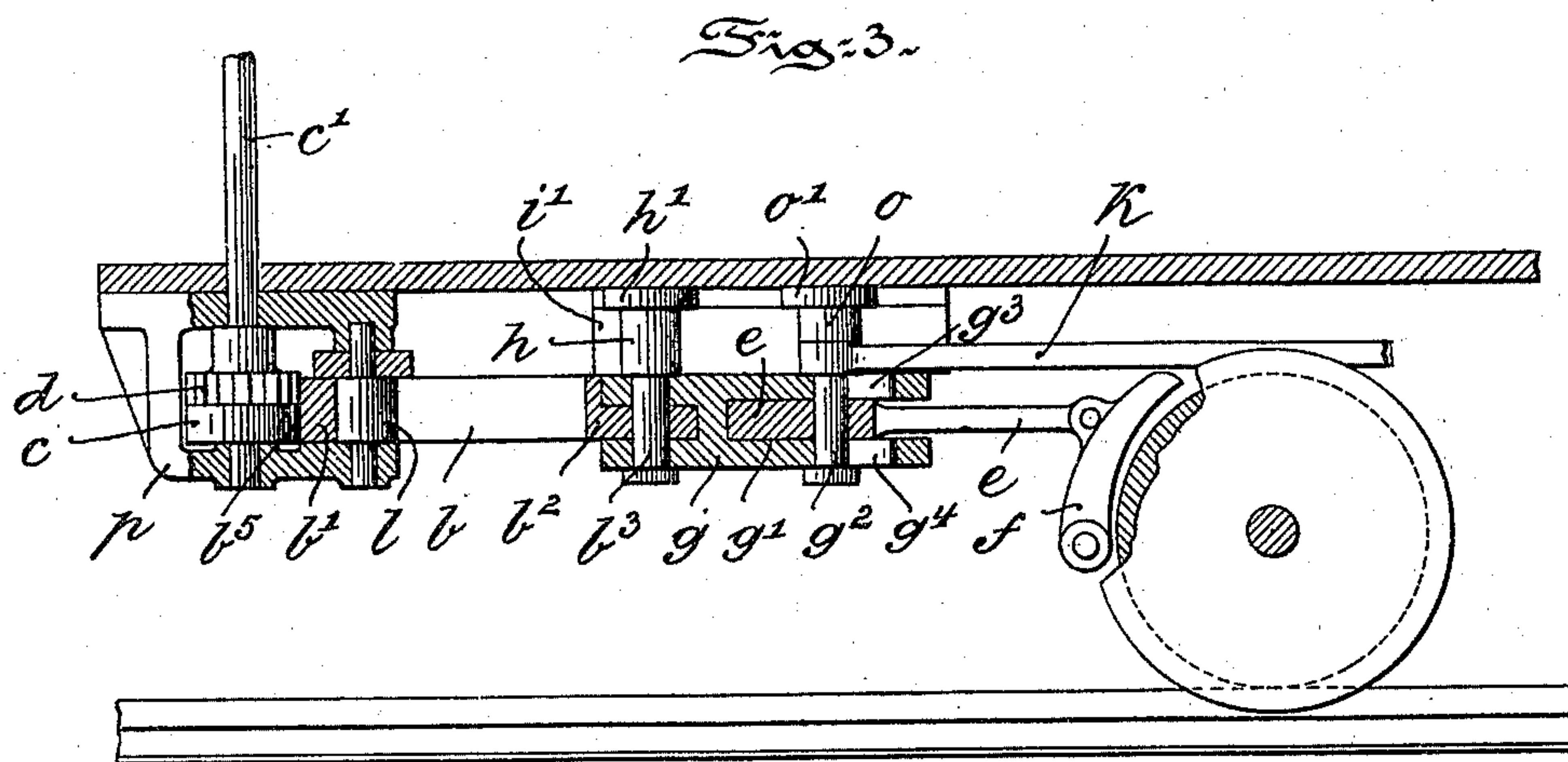
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2 Sheets—Sheet 2.



Witnesses:
Thomas M. Smith.
Richard C. Mayhew.

Inventor:
Charles A. Kruse,
By J. Walter Dugan
Attorney.

UNITED STATES PATENT OFFICE.

CHARLES A. KRUSE, OF PHILADELPHIA, PENNSYLVANIA.

CAR-BRAKE.

SPECIFICATION forming part of Letters Patent No. 640,921, dated January 9, 1900.

Application filed November 6, 1899. Serial No. 735,964. (No model.)

To all whom it may concern:

Be it known that I, CHARLES A. KRUSE, a citizen of the United States, residing in West Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Car-Brakes, of which the following is a specification.

My invention has relation to a quick-acting and positive brake for trolley or other motor-cars, and in such connection it relates particularly to the construction and arrangement thereof.

The principal object of my invention is to provide a car-brake in which by a small expenditure of energy an appreciable force is produced and adapted to be transmitted to the brake-shoes of a car to hold the same under reliable control. The principal means for operating the brake-shoes are based upon the principle of a wedge which requires a slight forward movement, which is transmitted to the same by comparatively little energy or force exerted to produce an appreciable side pressure which when utilized is adapted to readily or quickly apply the brake-shoes to the wheels of the car and in such manner as to bring the car to a standstill without jar or undue forward thrust. This wedge action in the present invention is obtained by a sector, the curved surface of which is eccentric to the fulcrumal point of the frame. The curved inclined portion of the sector positively guided is oscillated about a fixed point to produce a back-and-forth movement to its fulcrumed end. This forward movement is transmitted to the brake-shoes of the car and through the same to the car-wheels and which movement necessary to apply the brake to the car-wheels is a slight one, consequent upon the distance which the inclined surface of the sector has to travel to produce this movement, so that the brake can be applied by a few revolutions of the handle of the brake-operating rod, thereby insuring a powerful braking action. The means for transmitting the movement of the sector in the present invention preferably consists of a bail-shape yoke, which is in pivotal connection with the brake-shoes of the car.

My invention, stated in general terms, consists of a car-brake when constructed and ar-

ranged in substantially the manner hereinafter described and claimed.

The nature and characteristic features of my invention will be more fully understood from the following description, taken in connection with the accompanying drawings, forming part hereof, in which—

Figure 1 is a longitudinal elevation, partly in section, of a brake mechanism at each extremity of a motor-car embodying the main features of my invention. Fig. 2 is an underneath view, partly in elevation and partly in section, of said brake mechanism, showing the detailed construction and arrangement of the same. Fig. 3 is an enlarged sectional view of one end of the car with said brake mechanism applied thereto. Fig. 4 is a cross-sectional view of the yoke of said brake mechanism and also the means for guiding said yoke under the action of the sector device of Fig. 2; and Fig. 5 is an enlarged sectional view of the front end of the sector device, with its teeth and the pinion carried by the brake-operating rod for controlling the movement of said sector device in connection with said pinion.

Referring to the drawings, *a* is a car or vehicle of any suitable construction, preferably to the bottom of which and at either end thereof is arranged a sector *b*. The curved portion *b'* of the sector *b* is eccentrically arranged to the other end *b²*, engaged by a bolt *b³* and forming an incline or cam portion. The face of the cam portion *b'* of the sector *b* is provided with teeth *b⁴* and with a smooth portion *b⁵*, opposite which a roller *c* of a rod *c'* is arranged, the upper free end of which carries a handle *c²*. Above the roller engaging the smooth portion *b⁵* of the face of the sector and rigidly secured to the rod *c'* is located a pinion *d*, engaging the teeth *b'* of the sector *b*. By turning the rod *c'* by means of the handle *c²* the point *d* engaging the teeth *b'* imparts to the inclined curved sector end an oscillating movement, as will be readily understood in connection with Figs. 1 and 2 of the drawings, during which movement the smooth portion *b⁵* moves along the roller *c*, thereby revolving the said roller *c*. Swinging the inclined portion of the sector from the position illustrated in full lines in Fig. 2 to an opposite position the inclined curved por-

tion b' will impart to the end b^2 a forward movement toward the center of the car, which movement is transmitted to a preferably bail-shape yoke e , connected with the brake-shoes f of the car. The brake-shoes through this forward movement of the sector will be applied to the wheels of the car and held under control. The sector b , with its fulcrumed end b^2 , is connected to a coupling-piece g , the front end of which carries the bolt b^3 , to which the end b^2 of the sector b is secured. To the upper end of said bolt b^3 is secured a roll h , provided with a flange h' . This flange h' engages two angle-irons i and i' , holding thereby the end b^2 of the sector b in position. The side thrust imparted to the bolt b^3 of the end b^2 of the sector b during the oscillating movement of its inclined curved end b' will be compensated by said roll h and the angle-irons i and i' guiding the same. The bolt b^3 of the end b^2 of the sector will, by said angle-irons i and i' , be always guided in a perfectly central position with respect to the car-bottom.

The coupling-piece g is provided with a slot g' , in which is guided the central portion of the yoke e and held in connection therewith by means of a bolt g^2 passing through said yoke and through the slots g^3 and g^4 , arranged in the free end of the coupling-piece g , for a purpose to be presently fully explained.

To the yoke e and its bolt g^2 is secured the end of a rod k , the opposite end of which is pivoted to a lever-arm k' , preferably pivotally secured to the bottom of the car. To the opposite end of said lever-arm k' is pivoted a rod k^2 , the end of which is pivotally secured to a bail-shape yoke e' , slidable in a coupling-piece g of the same construction and arrangement as hereinbefore described. The forward movement of the end b^2 of the sector b , by means of the bolt b^3 , will be transmitted to the coupling-piece g , and by the same to the yoke e at one end of the car and through the intervention of the rods k and k^2 and lever-arm k' to the yoke e' at the opposite end of the car. It will therefore be understood from the foregoing description that the brake-shoes f and f' will be readily applied to the wheels at each end of the car to bring the latter under control as to the movement thereof.

The inclined curved portion b' of the sector b is engaged by a guide-roll l , which by the return movement of the inclined portion b' of the sector to the position indicated in full lines in Fig. 2 will impart to the end b^2 of the said sector b a backward movement, which will not be transmitted to the respective yokes e and e' . The lever-arm k has attached thereto a spiral spring m , the opposite end of which spring is preferably secured to the car-bottom, as illustrated in Fig. 2 of the drawings. The forward thrust imparted to the yokes e and e' will bring the spiral spring m under tension, which by the return of the sector b to its normal position will shift the respective yokes e and e' back into their

normal position in engagement with the coupling-piece g thereof. The bolt g^2 of the respective yokes e and e' , to which the connecting-rods k and k^2 are pivotally secured, as illustrated in Figs. 2 and 3 of the drawings, is provided with a roll o , having a flange o' , engaging the angle-irons i and i' . This roll o not only supports the yokes e and e' , but also takes up the side thrust imparted to the bolts g^2 by the operation of the connecting-rods k and k^2 . This thrust will be taken up by the angle-irons i and i' in the manner hereinbefore explained in connection with the roll h and bolt b^3 of the end b^2 of the sector b . The pinion d engaging the teeth b^4 of the inclined curved portion b' of the sector b and the roller c engaging the smooth portion b^5 thereof are preferably arranged or located in a bracket p , secured to either end of the car-bottom. The roll l engaging the rear face of the inclined curved portion b' of the sector b is also located in said bracket p . It will thus be understood that all the strain imparted to the wheels of the car through the brake-shoes and by the same to the yokes and sectors will be taken up by said brackets p . Moreover, the inclined curved portion of the sectors b will be positively guided between the pinion d and the rolls c and l in said bracket p , supporting the front end of each sector of the brake-operating mechanism of my said invention.

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

1. A car-brake provided with a sector having a curved face at one end and pivoted at its other end, a pinion adapted to mesh with the curved face of said sector to oscillate the same so as to impart respectively back-and-forth movements thereto and a yoke adapted to transmit one of the movements of said sector to the brake-shoes to engage the wheels of the car, substantially as and for the purposes described.

2. A car-brake, comprising a sector having a curved portion at one end eccentrically arranged with respect to the fulcrumal point at the other end, rollers adapted to guide said inclined portion, a pinion positively driven and adapted to engage teeth arranged on the face of the curved portion of said sector and to oscillate such portion against one of said rollers so as to impart a back-and-forth movement to the fulcrumal end of said sector, and means connected with said sector and brake-shoes adapted to transmit the forward thrust of said sector to the brake-shoes of the wheels of the car, substantially as and for the purposes described.

3. A car-brake, comprising a sector having a cam-surface at one end provided with smooth and toothed portions, a roller and a pinion adapted to engage said portions to impart to the fulcrumal end longitudinal movement at right angles to said curved portion, and a yoke connected with said cam-sector

adapted to transmit the movement in one direction to the brake-shoes of the car-wheels, substantially as and for the purposes described.

- 5 4. A car-brake, comprising a cam-sector, a pinion and rollers adapted to engage said cam-sector at one end to impart respectively back-and-forth movements to the other end of the same, a yoke slidably connected with
10 said cam-sector, rods and a lever connecting said yoke to a second yoke adapted to transmit the forward thrust imparted by the cam-sector of one of the yokes of the car to the other yoke thereof, substantially as and for
15 the purposes described.

5. A car-brake, comprising a cam-sector, a pinion and rollers adapted to engage the cam-sector to impart respectively back-and-forth

movements to the fulcrumal end thereof, a yoke in slidable connection with said cam-sector, rods and a lever-arm connecting the yoke with a similar yoke adapted to transmit the forward movement of the positively-actuated yoke to the other yoke, a spring engaging said lever-arm adapted to shift said yokes
20 into inoperative position, when the operating-sector returns to its normal position, substantially as and for the purposes described. 25

In testimony whereof I have hereunto set my signature in the presence of two subscribing witnesses. 30

CHAS. A. KRUSE.

Witnesses:

C. CONETER,
RICHARD TAYLOR.