

(No Model.)

3 Sheets—Sheet 1.

A. E. HARRIS.  
CAR BRAKE.

No. 277,274.

Patented May 8, 1883.

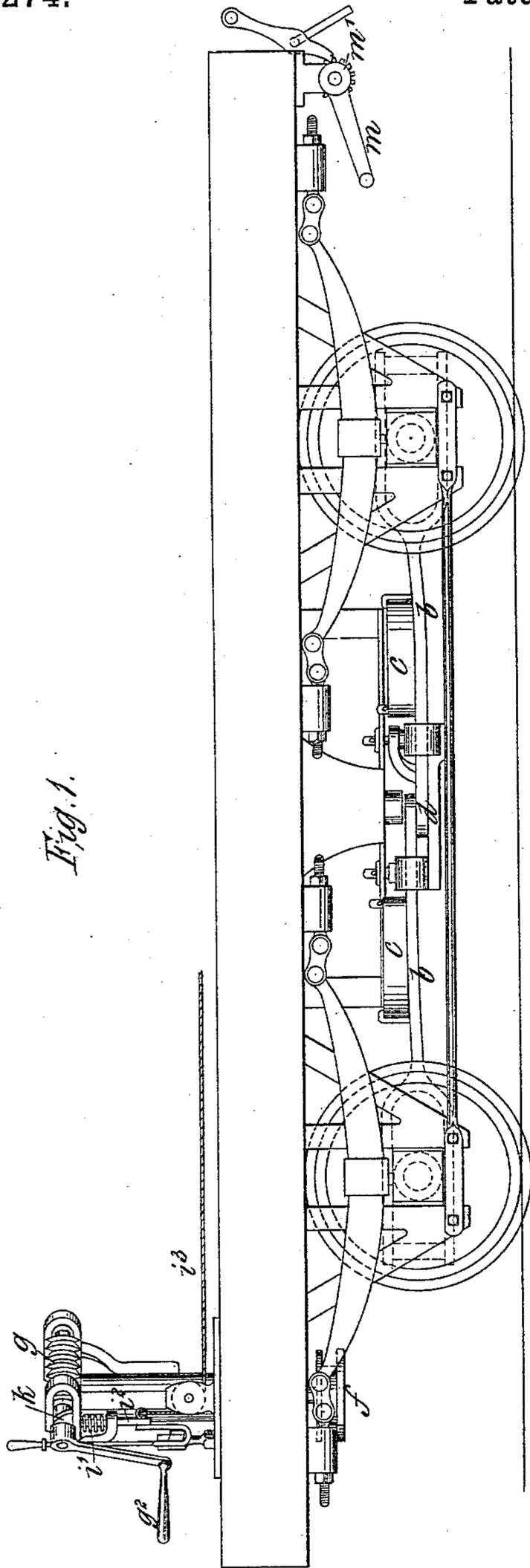


Fig. 1.

Attest;  
H. W. Howard  
J. M. Blackwood

Inventor;  
Alfred Ellis Harris  
by W. H. Doolittle  
his Attorney

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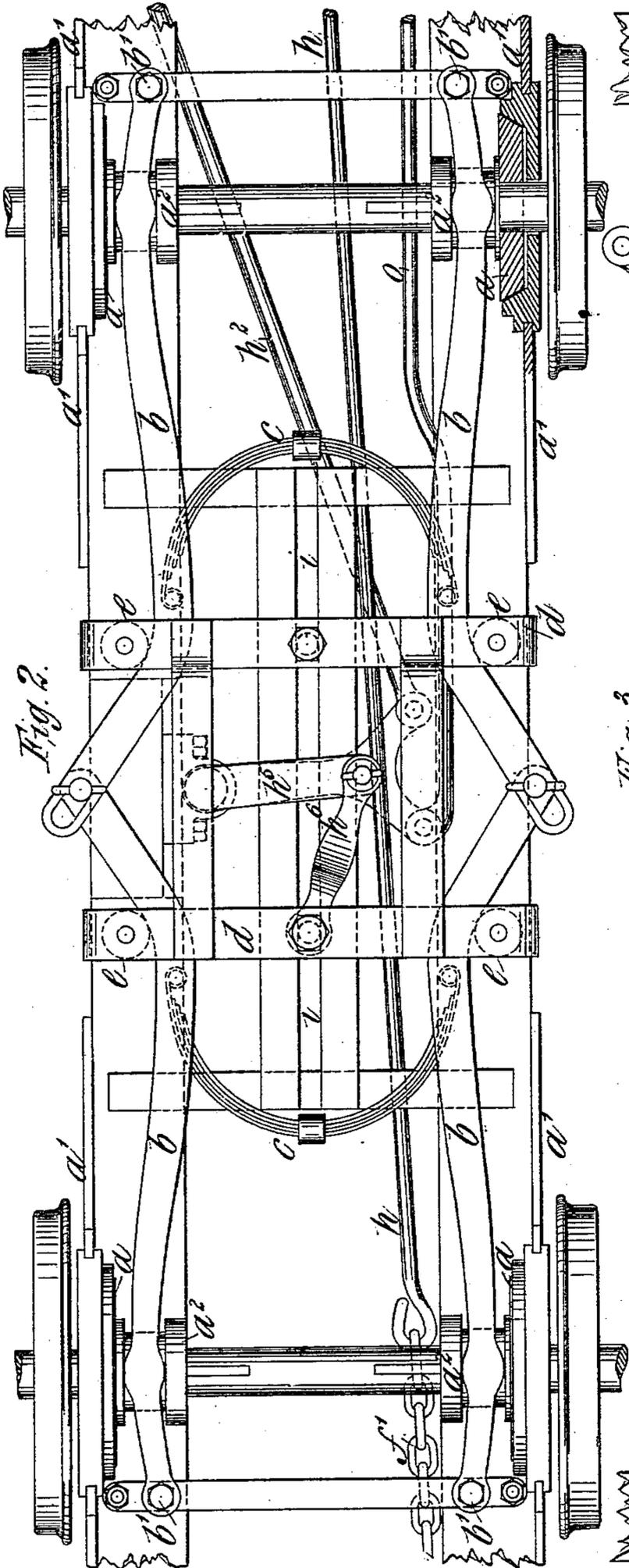


Fig. 2.

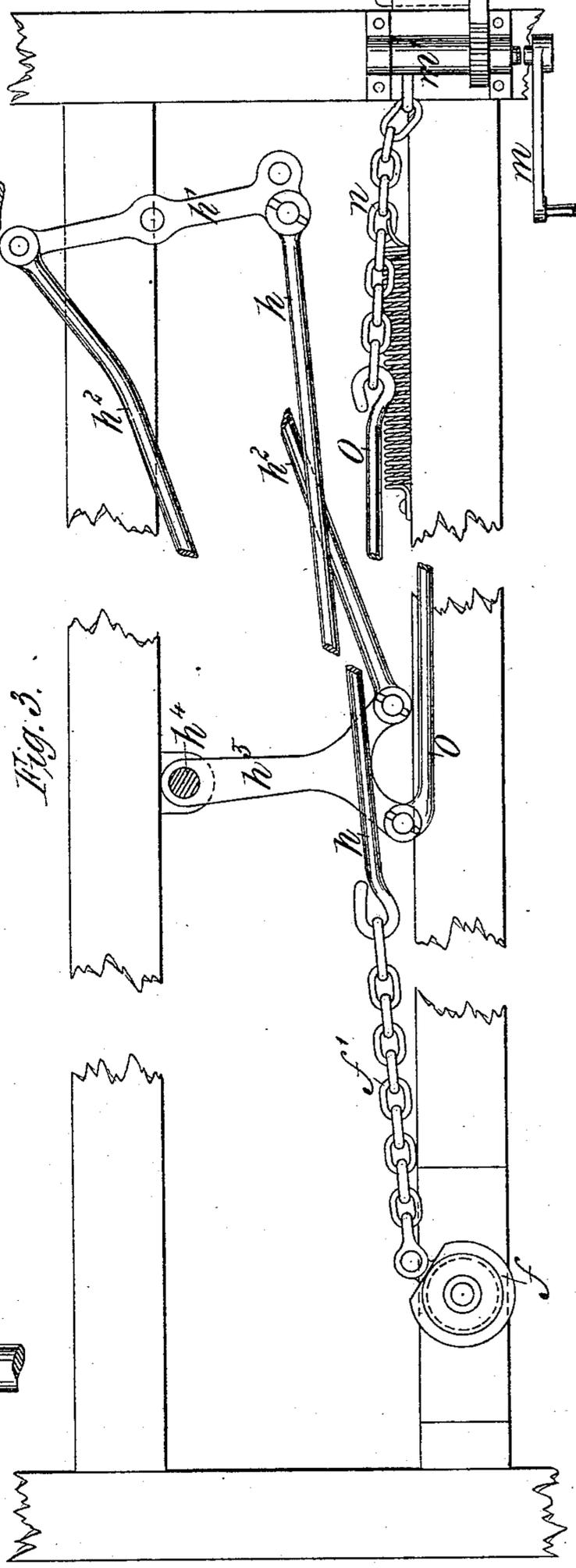


Fig. 3.

Attest  
 J. K. Howard  
 J. Blackwood

Inventor,  
 Alfred Ellis Harris  
 by W. H. Doolittle  
 his Attorney

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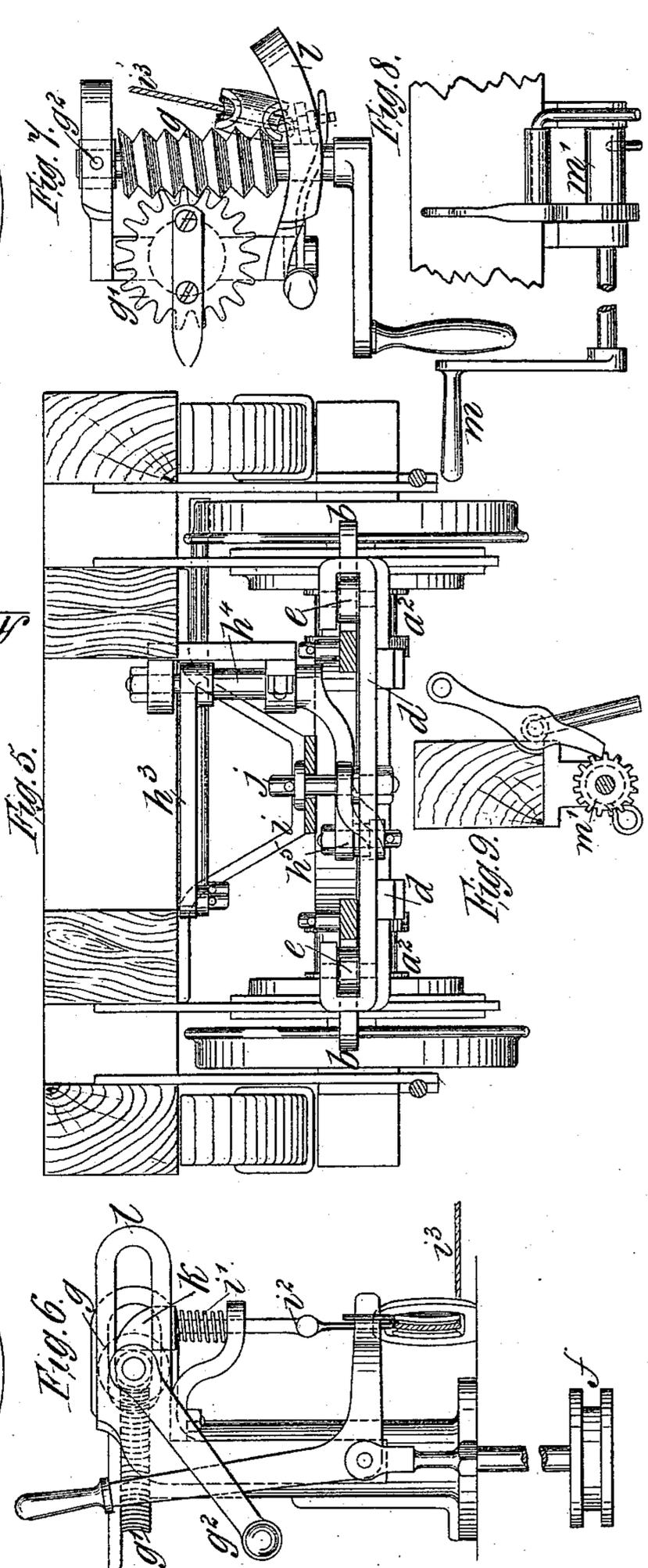
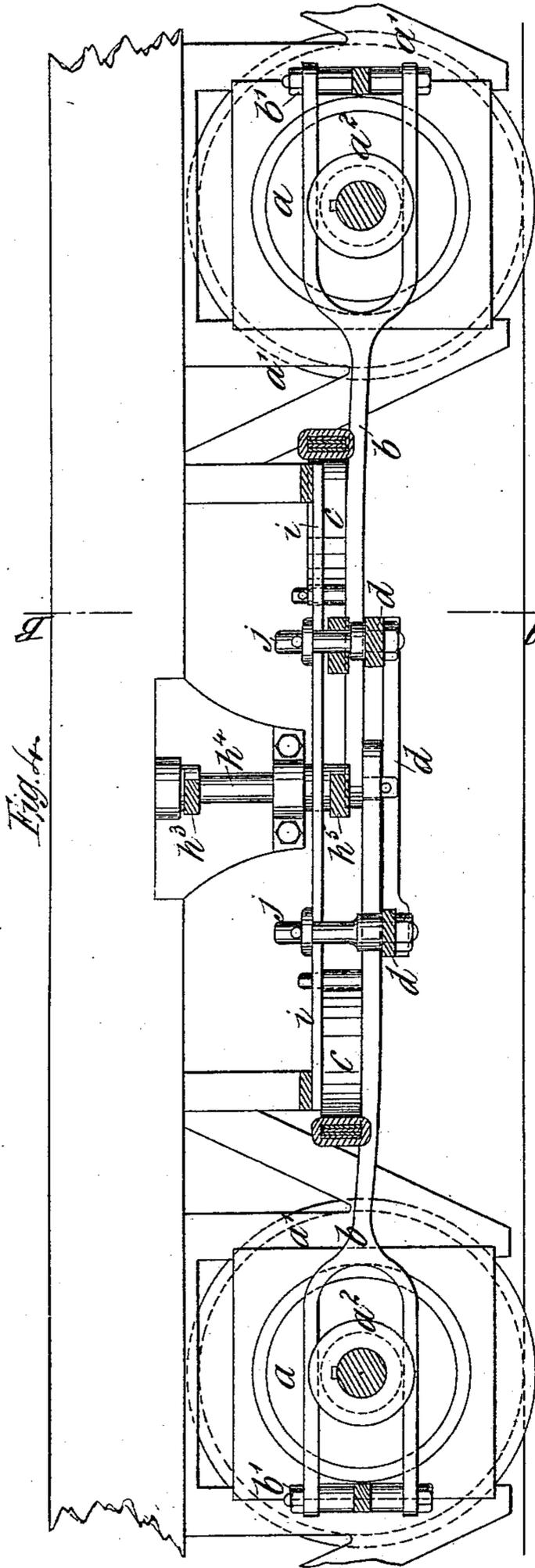
3 Sheets—Sheet 3.

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Attest;  
 J. M. Howard  
 J. Blackwood.

Inventor,  
 Alfred Ellis Harris  
 by W. H. Dogherty  
 his Attorney

# UNITED STATES PATENT OFFICE.

ALFRED E. HARRIS, OF MILE END ROAD, COUNTY OF MIDDLESEX, ENGLAND.

## CAR-BRAKE.

SPECIFICATION forming part of Letters Patent No. 277,274, dated May 8, 1883.

Application filed January 13, 1883. (No model.) Patented in England June 6, 1882, No. 2,657; in France December 5, 1882, No. 152,462, and in Belgium December 7, 1882, No. 59,769.

To all whom it may concern:

Be it known that I, ALFRED ELLIS HARRIS, a subject of the Queen of Great Britain and Ireland, residing at Mile End Road, in the county of Middlesex, Kingdom of Great Britain and Ireland, have invented new and useful Improvements in Railway-Brakes, (for which I have obtained a patent in Great Britain, No. 2,657, bearing date June 6, 1882,) of which the following is a specification.

My invention relates to a continuous automatic railway-brake wherein the arrestation or retardation of rotation of the wheels of the vehicle is effected by friction-clutches, whereof one part is on the axle of the vehicle and the other is carried in an attachment or attachments to the frame of the vehicle. To operate these friction-clutches I provide an arrangement of levers working on pins or pivots, and provided with means tending to move apart the free ends of such levers, so as to put the friction clutches into operation. To release or take off the brakes I employ a sliding device or frame that acts on inclined portions of (or attachments to) the said levers. This device or frame is operated by an arrangement of rods and levers, which can be brought into action by means of a worm and worm-wheel arranged on a spindle carrying a pulley, which operates a chain connected to the arrangement of rods and levers, whereby the sliding device or frame (which is suitably guided) is worked. In the event of a train becoming accidentally divided, or of the brake-connections being interrupted by fracture, the brakes will be automatically applied.

In the accompanying drawings, Figure 1 is a side elevation of the lower part of a carriage with apparatus according to my invention applied thereto. Fig. 2 is an inverted plan to a larger scale, showing a portion of the carriage with my apparatus applied to it as seen when looking from below; and Fig. 3 is a similar plan, showing the ends and middle of the carriage-framing with the rods and levers for operating the brakes. Fig. 4 is a central longitudinal section, showing a portion of a carriage with my apparatus applied thereto; and Fig. 5 is a vertical cross-section in the line A B of Fig. 4. Fig. 6 is a side elevation of the worm

and worm-wheel arrangement for operating the brakes. Fig. 7 is a plan of the same. Fig. 8 is a front elevation of apparatus for taking off the brakes by hand when required, and Fig. 9 is a side view of the same.

*a a* are friction-clutches, formed as male and female frustums of cones. The male cones are fitted onto the axles of the vehicle, so as (by the use of a feather or equivalent means) to be compelled to revolve therewith; but they are able to slide along the axles, as illustrated in section in Fig. 2. The female cones are held between horn plates *a' a'*, fixed to the framing of the vehicle, so that these cones cannot turn; but they will permit of the play of the springs by which the body of the vehicle is supported.

*b b* are levers pivoted to the framing at *b' b'*. The pins or studs forming the fulcra of these levers are fixed to a cross-frame, and are sufficiently long to allow of the movement of that frame in a vertical sense in relation to the axles, so as to allow for the play of the springs supporting the carriage-body without straining the levers. These levers *b* are for operating the male cones, and at their free ends the two levers *b*, at each side of the vehicle, are connected by a pin on one taking into a slot in the other, so that these ends of the two levers move together, or approximately so.

In the example illustrated I have shown at *c c* springs fitted to the free ends of the levers *b* and tending to force these ends apart, and thus to put the friction-brakes into operation; but it will be evident that for applying the brakes other means well-known—such as compressed-air or vacuum apparatus—may be employed. *d* is a sliding device or frame, the office of which is to release or take off the brakes. It is provided with anti-friction rollers *e e*, bearing upon the levers *b*, so that when this sliding device or frame *d* is moved longitudinally into such a position that its anti-friction rollers bear against the inclined portions or extensions of the levers *b*, then their free ends are caused to approach one another, thus moving the male cones out of contact with the female cones by acting upon the sliding sleeves *a<sup>2</sup> a<sup>2</sup>*, which are formed with or attached to the said male cones, and with them are carried on the axles of the vehicle. The sliding

device or frame *d* is operated by levers, rods, and links connected by means of a chain, *f'*, to a pulley, *f*. This pulley is operated by means of a worm, *g*, worm-wheel *g'*, and handle *g*<sup>2</sup>, which may conveniently be placed in a brake-van at the end of a train. When the pulley *f* is operated for the purpose of releasing the brakes, it causes the chain to pull the rod *h*, and, through the lever *h'*, Fig. 3, rod *h*<sup>2</sup>, and lever *h*<sup>3</sup>, turns the upright shaft *h*<sup>4</sup>, which is connected by means of the arm *h*<sup>5</sup> and link *h*<sup>6</sup> to the sliding device or frame *d*.

*i* is a guide for guiding the sliding device or frame *d* by means of pins or studs *j j*.

*k* is a sliding stop-piece fitted in the slotted curved bracket *l*, which carries the spindle of the worm *g*, so as to bear against the said spindle to keep the worm in gear with the worm-wheel. The stop *k* is kept up in the position shown in the drawings, Fig. 6, by the spring *i'*, and at its lower end (where there is a guiding part or tail *i*<sup>2</sup>) is fixed a cord or other similar connection, *i*<sup>3</sup>.

Upon the train becoming accidentally divided, or upon the brake-connections being interrupted by fracture, the said cord will be automatically pulled, thus pulling down the stop *k*, whereupon the worm *g*, pivoted at *g*<sup>2</sup>, will, by the action of the springs *c c* on the levers *b*, be caused to fly out of gear with the worm-wheel *g'*, thus allowing it to run round, and so permitting the brakes to be automatically applied. If the chain connected to the rod *h* of one carriage be connected to the lever *h'* of another carriage, instead of being connected to a pulley, *f*, then, if from any cause the two carriages become separated, the brakes of both carriages will be automatically applied. In this way the brakes of all the carriages in a train may be so connected that in the event of the train dividing at any part all the brakes will at once be automatically put in operation.

In Figs. 8 and 9 is shown an apparatus fixed to the end of a carriage for taking off and putting on the brakes by hand, when the carriage is slipped or is disconnected from the rest of a train for shunting or other purposes. The handle *m*, upon being turned, winds the chain *n* onto the barrel *m'*, which chain is connected by a rod, *o*, to the lever *h*<sup>3</sup>, whereby the sliding device or frame *d* is operated.

Apparatus worked by vacuum, compressed

air, steam, or hydraulic pressure may be used in lieu of the worm-wheel arrangement, as described, for taking off the brakes.

It will be evident that other variations may be made in the mode of carrying my invention into practical effect without departure from its distinctive characteristics. For example, the male cones may be carried by the horn plates *a' a'*, and the female cones may be arranged to turn with the axles, but so as to be movable lengthwise thereof for putting on and taking off the brakes. Also, instead of making *b b* levers of the second order, they may be levers of the first order, the inclines being reversed, so that *d* will force out the inclined ends to take off the conical or other brakes.

If apparatus worked by compressed air or vacuum, as well understood, be connected to the free ends of the levers *b*, so as to simultaneously draw inward the ends of the four levers or to simultaneously move them outward for putting on or taking off the brakes, it will be evident the springs *c* and sliding device or frame *d* may be dispensed with.

What I claim is—

1. The combination of the friction-clutches *a a*, formed as male and female frustums of cones, the axle to which the first-named clutch is fitted and on which it slides, and the plates *a' a'*, fixed to the framing of the vehicle, so that the clutches cannot turn, substantially as described.

2. In a railway-brake, in combination with frictional coupling devices, levers such as *b b*, means for moving the same in one direction, and a sliding device or frame such as *d*, for moving said levers in the contrary direction, substantially as described.

3. A railway-brake comprising male and female cones *a a*, levers *b b*, springs *c c*, with inclined parts, sliding device or frame *d*, and levers, rods, and links, connected by a chain, *f'*, to a pulley, *f*, for operating said sliding device or frame *d*, substantially as described and illustrated.

ALFRED ELLIS HARRIS.

Witnesses:

J. EDW. BEESLEY,  
WM. THOS. MARSHALL,  
Both of 2 Popes Head Alley,  
Cornhill, London, Gentn.