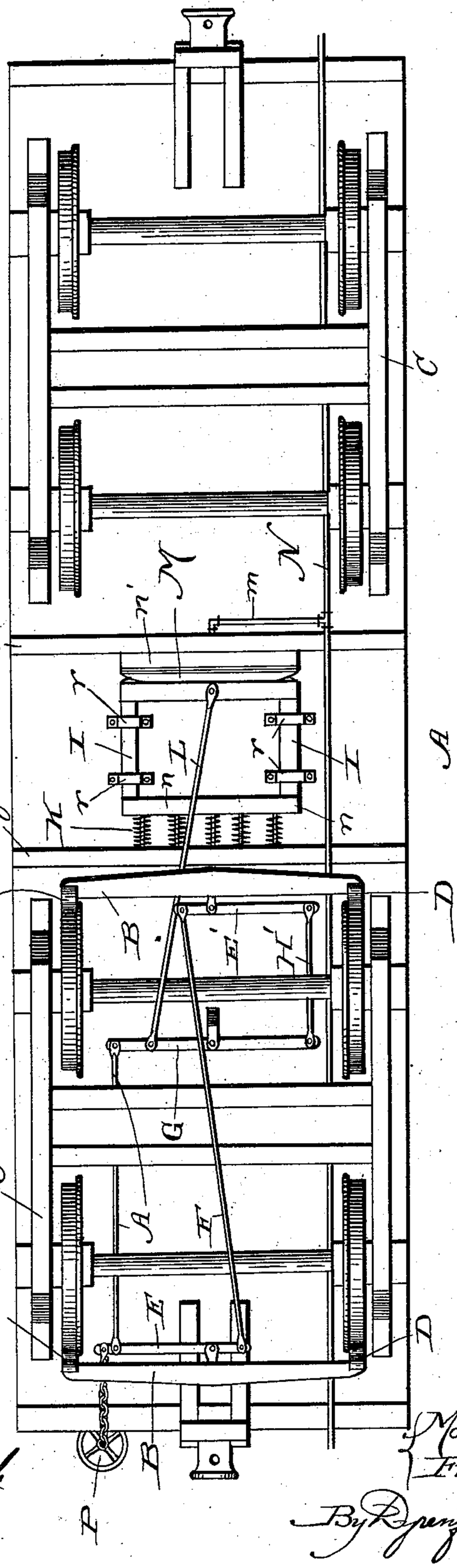
(No Model.) 2 Sheets—Sheet 1.

M. B. & F. W. MILLS.

CAR BRAKE.

No. 376,898. Patented Jan. 24, 1888.



Witnesses:
Chas. E. Gaylord.
Arthur Johnson.

Inventors;
Mortimer B. Mills
Frank W. Mills.
By Dyrenforth & Dyrenforth
Attys.

(No Model.) 2 Sheets—Sheet 2.

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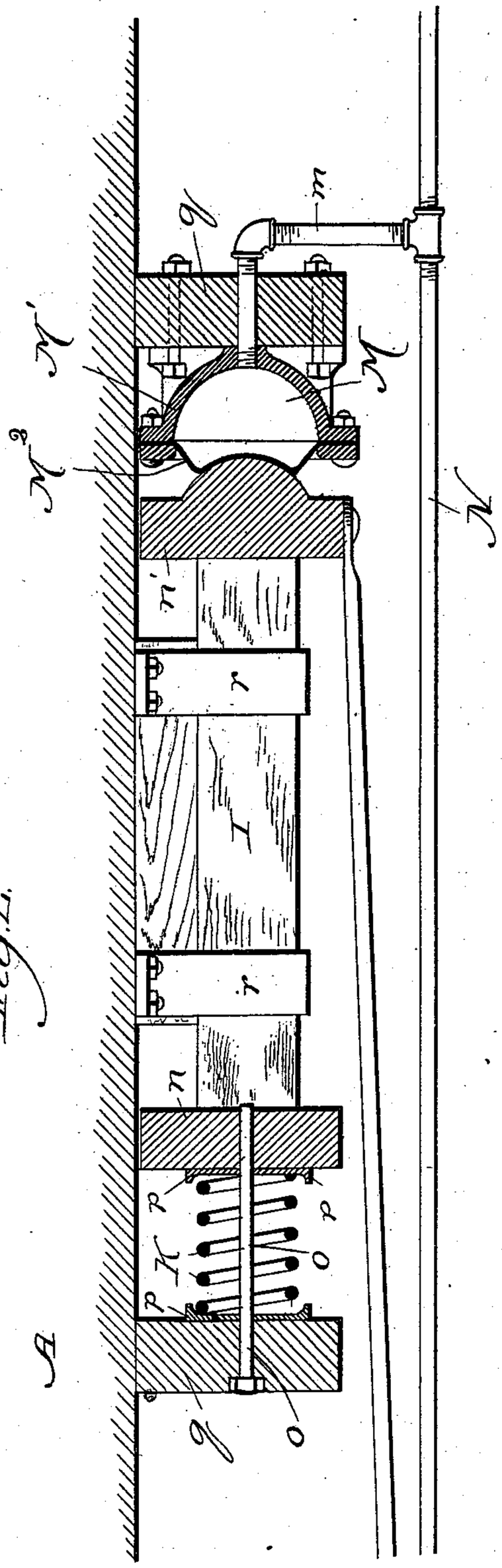

Fig. 2.

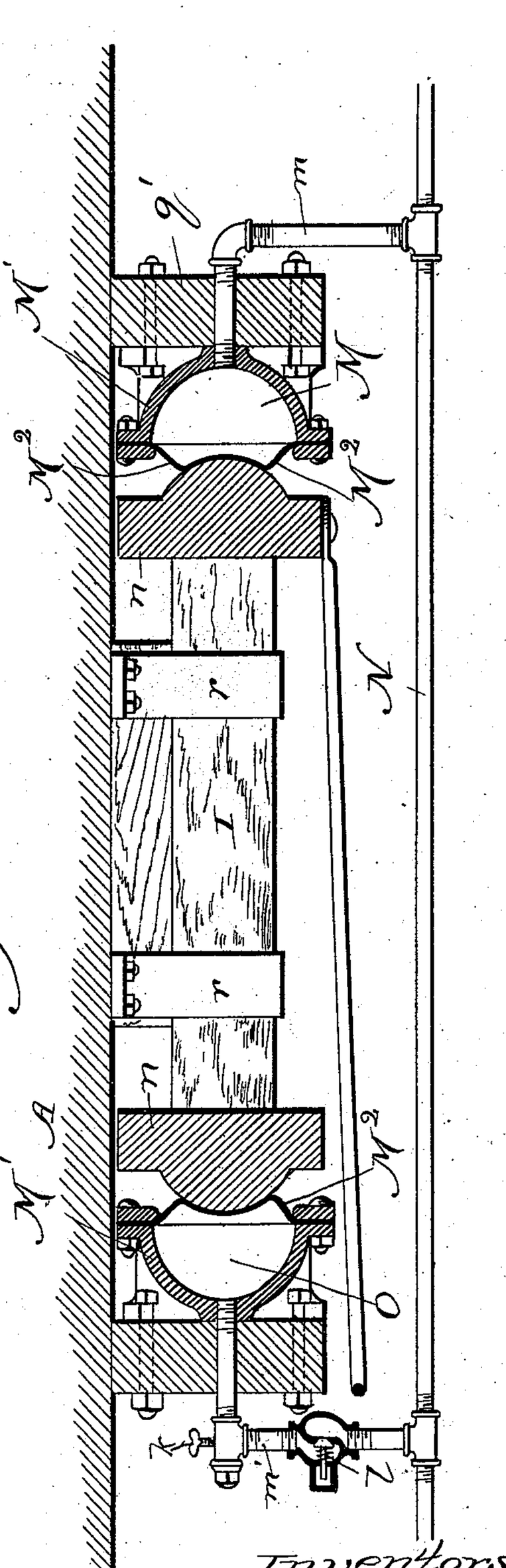

Fig. 3.

Witnesses:
Chas. E. Gaylord.
Arthur Johnson.

Inventors.
Mortimer B. Mills
Frank W. Mills
By Dyrenforth & Dyrenforth
Attys.

UNITED STATES PATENT OFFICE.

MORTIMER B. MILLS AND FRANK W. MILLS, OF CHICAGO, ILLINOIS.

CAR-BRAKE.

SPECIFICATION forming part of Letters Patent No. 376,898, dated January 24, 1888.

Application filed June 10, 1887. Serial No. 240,868. (No model.)

To all whom it may concern:

Be it known that we, MORTIMER B. MILLS and FRANK W. MILLS, citizens of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Car-Brakes; and we hereby declare the following to be a full, clear, and exact description of the same.

Our invention relates to an improvement in the class of car-brakes operated by air; and our object is to provide a mechanism for setting and releasing the brakes at will through the medium of pneumatic force, which mechanism shall be simple, durable, reliable, and effective in its operation, and afford advantages over other devices for the same general purpose.

In the drawings, Figure 1 is a bottom plan view of a freight-car provided with our improved brake-operating mechanism in its preferred form; Fig. 2, a broken longitudinal section taken through the car-floor near its center and showing our improvement in side elevation, and Fig. 3 a similar view of a modified construction.

Though our improvement is applicable to cars generally, we design it particularly for use on freight-cars, which are ordinarily provided with brake apparatus only on one truck; and we illustrate and describe our invention in the freight-car connection, for which it is especially designed, as aforesaid.

A is a freight-car provided with an ordinary form of brake appliance, comprising brake-beams B at opposite ends of a truck, C, and carrying brake-shoes D, levers E and E′, each pivotally connected to an adjacent brake-beam to produce a long and a short arm relatively on opposite sides of the fulcrums of the two levers, and having the short arms connected by a rod, F, a centrally-pivoted lever, G, having one arm connected by a link, H′, with the long arm of the lever E′, and the other arm, by a link, H, with the long arm of the lever E.

It will be seen on inspecting Fig. 1 of the drawings that by pulling on the arm of the lever G, with which the long arm of the lever E is connected, the brakes are set, and that on releasing the lever G from the strain of pulling the brakes are released, the brake-shoes falling away from the wheels by their own weight. The pulling and releasing for the purposes named are effected by means of our improvement, hereinafter described, which maintains the brakes normally set and releases them by the application of air-pressure.

Our improvement involves in its construction a frame, I, which we make rectangular in form, as shown, supported between transverse beams *q* and *q′* on the bottom of the car, near its center, by means of straps *r*, whereby it is confined, and may be shifted a desired distance in either direction longitudinally of the car. Between the end *n* of the frame I and the beam *q* is a row of spiral springs, K, confined between angle-irons or sockets *p*, Fig. 2, on the adjacent faces of the frame and beam *q*, each being on a rod, *o*, having its bearings in the said beam and adjacent side of the frame. The springs K tend to maintain the brakes normally set by connecting the frame I, through the medium of a rod, L, with the arm of the lever G, connected with the long arm of the lever E, as shown.

At the opposite end, *n′*, of the frame I, supported on the adjacent side of the beam *q′*, is an air-tight collapsible and expansible chamber, M, comprising a dish, M′, of semi-cylindrical form, secured to the inner face of the beam *q′*, and covered by a flexible diaphragm, M^2, formed, preferably, of a sheet of rubber covered with canvas or duck cloth clamped near the edges, as indicated in Figs. 2 and 3, to the flanged edges of the semi-cylindrical dish, and affording a yielding bearing for the adjacent end, *n′*, of the frame I, which is made of the semi-cylindrical form shown, or convex, to produce complete collapsing of the diaphragm M′, in the manner and for the purpose hereinafter described.

The chamber M communicates through a branch tube, *m*, with a pipe, N, running along the bottom of the car, and which is to be coupled to pipes like it on other cars similarly equipped, to afford a continuous air-conduit communicating with the air-pressure pump on the locomotive, where the supply of air to and the exhaust thereof from the conduit N and chambers M through the branches *m* is controlled in the usual manner by ordinary means.

To release the brakes air is forced through the conduit N into the various chambers M on the different cars in a train, expanding the diaphragms M^2 and thereby forcing the frame

I in a direction to compress the springs K and releasing the brake-beams from the pull exerted by the rods L. The pneumatic contents of the chambers M are exhausted by suitable manipulation of the proper valve in the pump apparatus on the locomotive, when the springs K of each frame by their resilience force the frame against the diaphragm M^2, thereby pulling the rod L to set the brakes, and the semi-cylindrical form of the end n' of the frame by fitting into the dish M′ insures the complete collapse of the diaphragm M^2.

Instead of springs K for maintaining the brakes normally set, any other suitable expansible yielding agent may be employed, and we illustrate one such agent in Fig. 3 of the drawings. This consists of a collapsible and expansible chamber, O, formed exactly like the chamber M, inasmuch as it comprises a semi-cylindrical dish, M′, secured to the inner face of the beam q, provided with a diaphragm, M^2, affording a yielding bearing for the adjacent semi-cylindrical or convex end, n, of the frame I, and the chamber O communicates with the conduit N through a branch tube, m', containing a check-valve, l, arranged to open by air-pressure introduced into the chamber through the tube m', but to close the passage against the escape of the contents of the chamber O.

As illustrated in Fig. 3, the chambers M and O are shown to be equally expanded, each bearing with the same pressure against the opposite ends of the frame, which is thus maintained in a central position with relation to the limits of its shifting capacity, this being the condition of the modified form of my appliance, wherein the brakes are "off," and the initial condition of the apparatus. Before starting the train the pneumatic contents of the chamber M on each car are exhausted, thereby removing all resistance from the flexible diaphragms of the chambers O, which, since the contents of the latter, owing to the presence of the check-valves l, cannot escape, expand against the frame, as in the case of the resilience of the springs K, and shift the frames I to pull the rods L, and thus set the brakes. To release the brakes air is admitted into the conduit N, whence it enters the chambers M only, until the pressure therein equals the pressure in the chambers O. The admission of compressed air into the chambers M moves the frames I against the chambers O to produce the relative conditions of expansion shown in Fig. 3, wherein the brakes are released by relieving the pull exerted through the rods L.

Ordinary stop-cocks, k, are provided on the branch tubes m', to permit the contents of the chambers O to be exhausted whenever occasion requires.

A hand-wheel, P, connected with the long arm of the lever E, affords means for releasing the brakes by hand, when required.

We are aware that it is not new to employ mechanism for operating the brakes of cars comprising springs for maintaining the brakes normally set and pistons in cylinders actuated by fluid-pressure to release them; and we do not therefore claim, broadly, mechanism for this purpose.

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

1. The combination of the brake mechanism of a car, a shifting frame, I, provided with a convex bearing, n', on one end, a spring at one side of the frame, operating to hold it normally in a position to set the brakes through the medium connecting it therewith, and a chamber, M, at the opposite side of the frame, to communicate with an air-pressure supply, and comprising a dish, M′, covered by a flexible diaphragm, M^2, bearing against the projection n' on the frame, substantially as and for the purpose set forth.

2. The combination, with a car, of brake-beams B, carrying brake-shoes, levers E and E′, having their short arms connected, a lever, G, connected on opposite sides of its fulcrum with the long arms of the levers E and E′, a shifting frame, I, connected with the lever G, springs K, confined against one side of the frame and operating to maintain the brakes normally set, a conduit, N, and a collapsible chamber, M, communicating with the conduit N and confined against the opposite side of the frame I, substantially as and for the purpose set forth.

MORTIMER B. MILLS.
FRANK W. MILLS.

In presence of—
GEORGE C. COOK,
J. W. DYRENFORTH.