

(No Model.)

2 Sheets—Sheet 1.

D. B. MILLS & S. W. KOELLER.
APPARATUS FOR AUTOMATICALLY EXTINGUISHING FIRES AND LAMPS
AND OPERATING THE BRAKES ON RAILWAY CARS.

No. 389,236.

Patented Sept. 11, 1888.

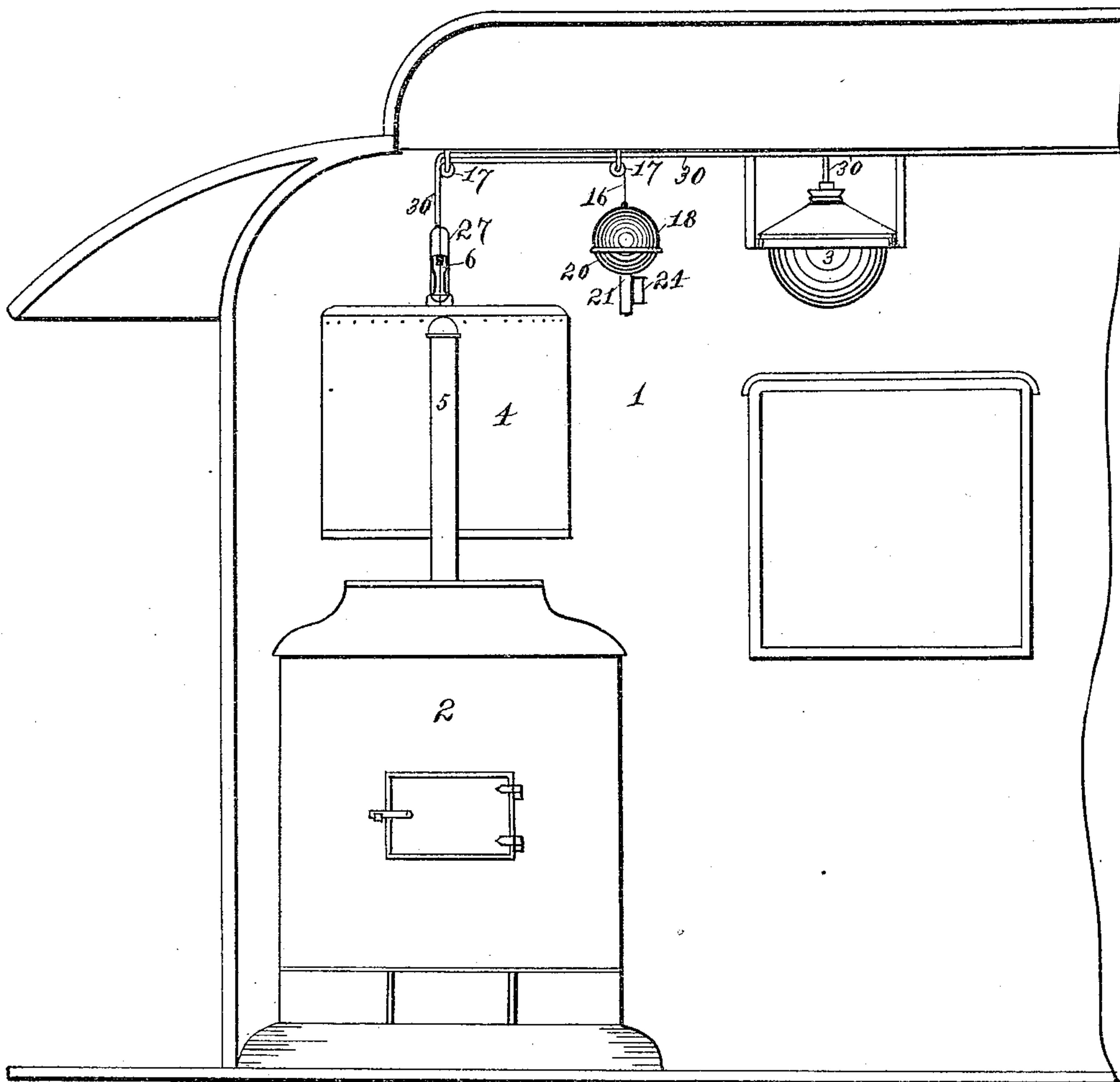


Fig. 1.

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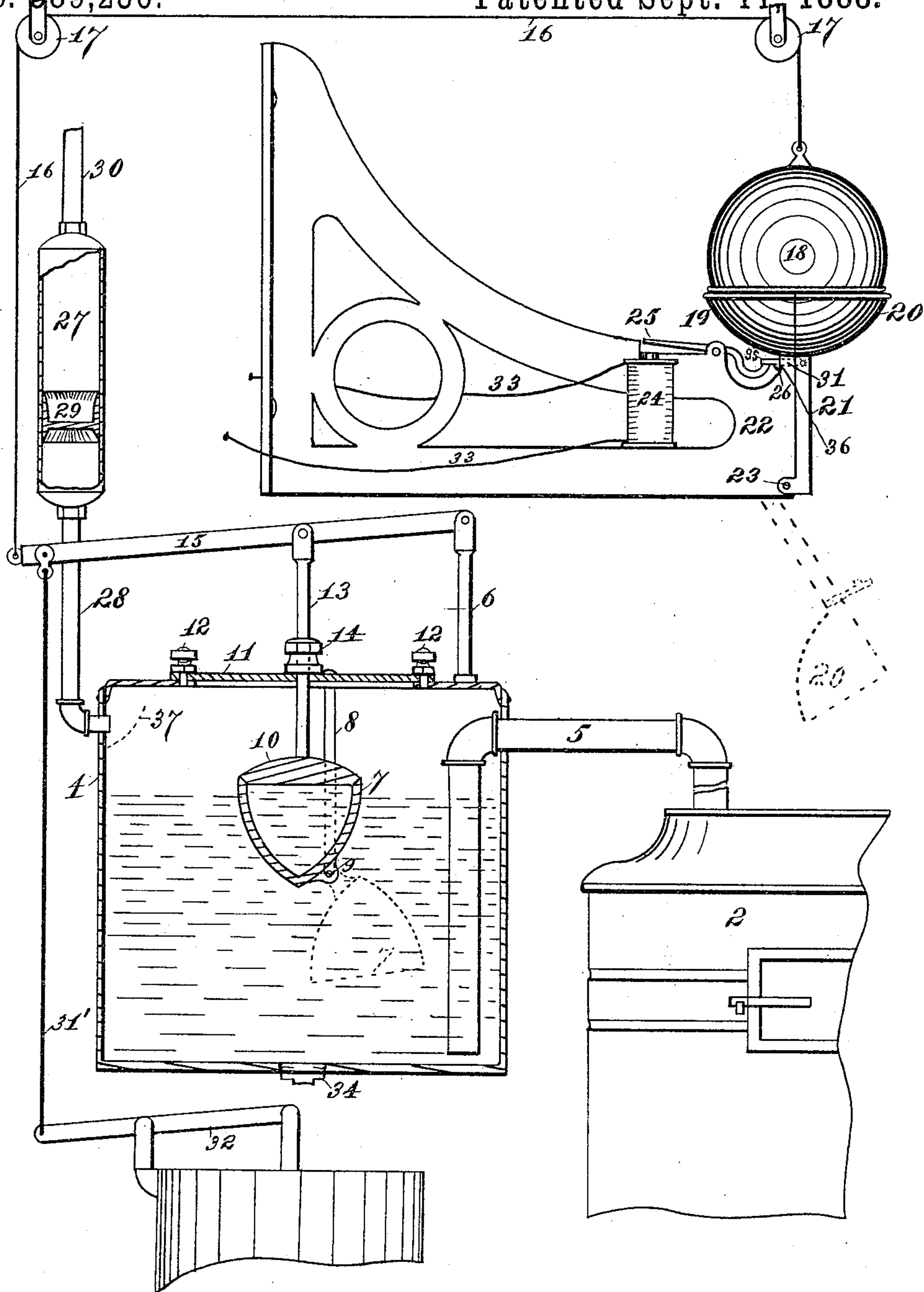


Fig 2

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UNITED STATES PATENT OFFICE.

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APPARATUS FOR AUTOMATICALLY EXTINGUISHING FIRES AND LAMPS AND OPERATING THE BRAKES ON RAILWAY-CARS.

SPECIFICATION forming part of Letters Patent No. 389,236, dated September 11, 1888.

Application filed June 9, 1888. Serial No. 276,618. (No model.)

To all whom it may concern:

Be it known that we, DAVID B. MILLS and SAMUEL W. KOELLER, citizens of the United States of America, residing at Denver, in the
5 county of Arapahoe and State of Colorado, have invented certain new and useful Improvements in Apparatus for Automatically Extinguishing Fires and Lamps and Operating the Brakes on Railway-Cars, of which the following is a specification, reference being had therein to the accompanying drawings.

Our invention relates to apparatus designed and arranged on the occurrence of certain contingencies or the existence of certain conditions, as hereinafter set out, to automatically and simultaneously throw into operation means for extinguishing any fire there may be in the car-heater, means for blowing out any lamps that may be alight in the car, and means for
20 setting the air-brakes of the car; and its objects are to furnish such an apparatus of comparatively simple construction, readily charged and arranged for operation, reliable and efficient in operation, adapted for application to
25 cars already in use, as such application involves no change in the construction thereof, capable of being instantly thrown into operation upon the occurrence of an accident to the car or which may be operated from another
30 part of the train—as, for instance, from the engineer's cab—when deemed necessary, and which shall also be durable and not liable to accidental disarrangement or injury, to which ends it consists in the features, arrangements, and combinations more particularly herein-
35 after set forth and claimed.

In practicing our invention a chemical fire-extinguisher embodying agents and means for the production of a non-combustion-support-
40 ing gas is connected to the car-heater, so as to discharge its contents thereinto when thrown into operation. The acid-cup therein is so pivoted and supported that its top or mouth portion overweights or overbalances its base; hence normally it would hang within the ex-
45 tinguisher-body in position to discharge its contents into the alkaline solution therein. A lid is provided for it attached to a rod passing through the wall of the extinguisher, the lid and the mouth of the acid-cup being so shaped
50 that when the lid is in position thereupon and

attached to its rod it will hold the cup in an upright and contents-retaining position. The rod is pivoted to a lever fulcrumed on the exterior of the extinguisher, the free end of the
55 lever being connected by a cord or rope passing over suitably arranged pulleys to a weight sustained in a bowl or pan, wherein it rests securely under the ordinary conditions of travel or movement of the car and with no
60 pull or strain on its cord, but from which it is thrown upon the occurrence of unusual jolt, jar, side or tipping motion, such as results from collision or derailment. So released, the weight falls, pulling upon the cord in propor-
65 tion to its weight, and through the cord moving the lever, which in turn, by means of the connecting-rod, lifts the lid from the acid-cup, whereupon the latter turns over, emptying its charge into the alkaline solution, which is
70 then, by the pressure of the gas generated, forced into the car heater or stove.

From the top or near the top of the extinguisher a tube or system of tubing leads to the various lamps in the car, there being an out-
75 let at each lamp arranged to throw a blast upon the flame thereof. Such blast may be of the gas generated in the extinguisher, or it may be an air-blast caused by the pressure of such gas. In the latter case a cylinder is interposed
80 in the tubing between the lamps and the extinguisher, in which cylinder is a piston weighted or constructed to remain normally at the inlet end thereof. When, however, gas is generated, its pressure forces the piston to
85 the outlet end, driving the air before it and out at the outlets at the lamps.

The lever, connected by the cord to the weight and operated by the displacement of the latter, is also connected to the devices
90 found in each car for setting the air-brakes from within the car, so that the movement of the lever to accomplish the results before noted also causes the setting of the air-brakes. To enable these devices to be operated from a part
95 of the train other than or outside of the point or the car wherein they are located, the bowl sustaining the weight is made in two parts, one being pivoted or attached to a pivoted arm to normally fall away from the other
100 part. These parts are held together in position to sustain the weight by a trigger or hook

controlled by the armature-lever of a magnet whose circuit extends to the points from which, if occasion arises, it may be deemed desirable to cause the operation of the devices, proper circuit-controlling keys or buttons of ordinary and well-known construction being located at such point or points. Upon the circuit-controlling key being operated at such a point, the magnet causes its armature-lever to release the pivoted part of the bowl or pan, permitting the weight to fall, whereupon the devices are actuated and act as before noted. This may perhaps be better understood by reference to the drawings, wherein is illustrated an embodiment of our invention, and in which drawings—

Figure 1 is an elevation or side view of a part of the interior of a car with our improved apparatus in operative position; Fig. 2, an elevation, mainly sectional, of the apparatus, showing the construction and relative arrangement of the parts.

In the figures, the reference-numeral 1 indicates the car, 2 a stove or heater therein, and 3 a lamp or lamps therein. Arranged or secured at any convenient or suitable place within the car, (though preferably, as being out of the way and of sight, we arrange it and the associated devices in one of the closets of the car,) is a fire-extinguisher, 4, from which a pipe, 5, leads into the top of the stove or heater 2, wherein its end may be rose-nozzled, if desired, to insure greater diffusion of the liquid discharged therefrom. This tube or pipe 5 terminates near the bottom of the extinguisher 4 and within it, to insure discharge of nearly all its contents when sufficient pressure is caused by the evolution of gas therein. The acid-cup 7 of the extinguisher is pivoted near its base to an arm or support, 8, depending from the top of or a cover to the extinguisher. (Herein shown as depending from a cover, 11.) This support 8 may be a fork or U-shaped, the cup being pivoted thereto at its base or bend. As the pivot is near the base of the cup or below its center of gravity, when the cup is in an upright position, as shown in full lines in Fig. 2, it tends normally to hang in the position shown in dotted lines in the same figure—mouth downward and in non-contents-holding position. For it is provided with a cover or lid, 10, attached to a rod, 13, passing without the extinguisher and pivoted at its outer end to the lever 15, fulcrumed in a standard, 6. Where such rod 13 passes through the top or cover 11 of the extinguisher, a stuffing or packing box, 14, may be used to make a tight joint thereat. The cover 10 and the mouth of the acid cup or jar 7 are so formed relatively to each other that when the lid is in position it shall, it being sustained in position by the rod 13, hold the cup or jar upright, and a simple and effective way of forming such a union is by beveling the periphery of the lid and the interior of the mouth to fit each other, as shown in Fig. 2.

For purposes of access to the interior of the

extinguisher and to permit the acid-cup to be charged and fixed in position, the top of the extinguisher should be apertured, the aperture being closed by a cover, 11, secured thereover by screws 12, or by bolts, or by other ordinary means. At its free end the lever 15 is connected to one end of a cord, 16, which passes over pulleys 17, attached to the ceiling of the car or to other suitable base, the other end of such cord being attached to a weight, 18. This weight rests in and is sustained by a pan or bowl, so as to relieve the cord of any strain or pull and leave the parts in the condition shown in Fig. 2. The weight and bowl or pan are so adjusted to each other that the weight rests securely in the pan or bowl under normal conditions, the bowl or pan being of sufficient size to retain the weight against the influence of ordinary jarring or jolting, the weight being dislodged or thrown therefrom by an unusual or dangerous disturbance.

To enable the weight to be dislodged from the bowl or pan from other parts of the car, or of the train, the pan or bowl is made in two parts, 19 and 20, one of which is attached to or secured upon the bracket 22, projecting from and secured upon the sides of the car or other suitable base. The other portion, 20, is upon the head of an arm, 21, pivoted, as at 23, to the edge 36 of the bracket 22, the part 20 of the bowl or pan and arm 21 tending to fall away from the part 19, as shown in dotted lines in Fig. 2.

In or to the arm 21 is pivoted a hook-arm, 31, having a hook or catch, 26, and a projecting end, 35. This arm passes through a slot in the upper part of the edge 36, the hook or catch 26 taking over the edge of the slot and locking arm 21 to the bracket 22, and the parts 19 20 in holding position.

To the bracket 22 is secured an electro-magnet, 24, whose circuit extends by conductors 33 to any desired points in the train. In practice a preferable point would be the engineer's cab, where would be placed in the circuit (which may be either an open or a closed circuit) a proper key to control the circuit, so that the engineer may be able to operate the safety devices in a car upon the impendence of danger and before an accident has actually occurred.

The magnet is provided with the usual armature and lever, 25, and retractile spring or equivalent. The outer or free end of the armature-lever takes under the end 35 of the hook-arm 31, permitting the hook 26 to remain in locking engagement, while the circuit and the magnet are left in normal condition. If, then, such conditions be changed by manipulation of the circuit-controlling key, the magnet causes the armature-lever to lift hook 26 from its seat 20, then falling away from 19, and releasing the weight.

When it is desired to use an air-blast for the extinguishment of the lamps, a cylinder, 27, is connected by a tube, 28, with the extinguisher 4, while from the other end of the

cylinder a tube or system of tubing, 30, leads to the various lamps 3 in the car, there being an outlet from the tubing 30 at each lamp 3 in such relation thereto that any blast from the outlet will blow across the wick of the lamp and through any flame thereat. Within the cylinder is seated a loose piston, 29, of such weight or construction that it naturally remains at the inlet end of the cylinder, and upon being moved to the outlet end forces a current of air through tubing 30.

Instead of using a jet of air so created for the extinguishment of the lamps, a jet or blast of the generated gas itself may be used for such purpose. In such case the cylinder 27 and its piston are dispensed with and the gas allowed to circulate through the pipes 28 30 directly to the lamps, a diaphragm or shield (shown in dotted lines at 37 in Fig. 2) being placed before the inlet to the tubing within the extinguisher to prevent water from being carried into the tubing by foaming, &c.

In all cars equipped with air-brakes as now constructed is to be found a mechanism for throwing the brakes into operation from within the car, and the lever of such a mechanism is shown at 32. By a wire or cord, 31, it is connected with the lever 15, whose operation is controlled by the weight 18, so that the upward movement of such lever also operates the lever 32 and the brake-setting devices. By using a flexible mechanical connection, as a wire or cord, from lever 32 to lever 15 the former is left in condition to be operated by the ordinary conductor's cord or pull therefor and without interference by or with the lever 15 and its associated parts—that is, so that the lever 32 may be operated independently of lever 15 and without influencing the latter, while the motion of the latter is always communicated to the former.

The conductors for the circuit of the magnets in the various cars of a train may be carried in or on the air-brake hose or tubing and coupled, as the hose or tubing is coupled, together in a manner hitherto proposed for electric signaling throughout a train; or they may be carried in a separate cable or cables, a car-length being secured to or upon each car, the ends thereof being furnished with couplers or clips uniting the corresponding wires of the various lengths, several forms of such couplers or clips being already known.

If desired, what is known as the "three-system of circuiting" may be used, it permitting a number of circuit-controlling keys to be used in one open circuit to close the same and control a number of magnets or one magnet therein.

The operation of the devices arranged relatively to each, as shown, is as follows: The proper amount of alkaline solution being placed in the body of the extinguisher and of acid in the cup, the lid of the latter being secured upon the cup and the weight placed in its support, the pan or bowl, the normal position and condition of the various parts of the

apparatus is as shown in full lines in Fig. 2. If, now, such a jar or jolt occurs as is sufficient to throw the weight 18 from its seat, and such jolt or jar, if the parts be properly adjusted, will only occur through an accident or immediate danger of an accident, the stress of weight 18, acting through the cord 16, raises lever 15, lifting cover 10 from its seat on the mouth of the acid-cup 7. The latter immediately turns over upon its pivot 9, discharging its acid into the solution. The pressure of the evolved gas immediately forces the contents of the extinguisher through pipe 5 into the stove or heater 2 to put out any fire there may be therein. At the same time the pressure engendered forces the piston 29 toward the outlet-pipe or system of pipes 30, or forces gas into the pipes, creating a blast through such pipes to extinguish such lamps as are lighted. Simultaneously the lever 15 acts through the wire 31 on the lever 32 to set the brakes, all coacting to form a quickly-operating, reliable, and effective safety apparatus and attachment for railway-cars.

It is evident that the relative location of the parts upon or within the car might be varied, and that forms of devices other than the forms shown, but having the same general functions, might be used without departing from the general spirit and principle of the invention. It is also evident that the weight and its peculiar support used for controlling the action of the extinguisher and associated devices might be used to control the action of any other form of fire-extinguisher, chemical, compressed air, &c., and other forms of associated devices, or to control the action of the inlet-valves or outlet-valves of other forms of extinguishers. It is also evident that the pipe 5 may lead into any part of the stove, either at the top or at the bottom or upon the side, and that, if deemed best, it may be branched and enter the stove at two or more points.

Having thus described our invention, what we claim is—

1. In an apparatus for automatically extinguishing fires in car-stoves, the combination of a fire-extinguisher, a tilting acid-cup suspended therein, a cover for such cup adapted to hold it upright and connected by a rod to a lever outside of the extinguisher, a cord attached at one end to such lever and passing over pulleys and attached at its other end to a weight, a support for the weight retaining it under normal conditions, and a pipe leading from near the bottom of the extinguisher into a stove or heater, substantially as set forth.

2. The combination of a fire-extinguisher, a pipe leading from near its bottom into a stove or heater, a tilting acid-cup suspended therein, a cover for such cup adapted to hold it in upright position and connected by a rod to a lever outside the extinguisher, the lever, a cord passing over pulleys and connected at its ends to such lever and to a weight, a support sustaining the weight under normal condition,

and a pipe or system of tubing leading from the extinguisher to the lamps and forming a lamp-extinguishing blast apparatus operated by the pressure of gas in the extinguisher, substantially as set forth.

3. The combination of a fire-extinguisher, a pipe leading from near the bottom thereof into a stove or heater, a tilting acid-cup suspended therein, a cover for such cup adapted to hold it in upright position and connected to a lever upon the exterior of the extinguisher, the lever, a cord passing over pulleys and connected at its ends to such lever and to a weight, the weight, a bowl or support therefor retaining it under normal condition, and a mechanical connection from said lever to the devices within the car for setting the air-brakes, substantially as set forth.

4. The combination, with a weight for controlling the operation of a fire-extinguisher, of a bowl or support therefor made in two pieces, one pivoted to the other and normally falling

away therefrom and unseating the weight, and locking hooks or triggers holding the two parts in operative connection, and means, substantially as described, for disengaging the hooks or triggers, substantially as set forth.

5. The combination, with a weight for controlling the operation of a fire-extinguisher, of a bowl or support divided into parts, one pivoted and normally falling away and unseating the weight, locking hooks or triggers holding the parts in operative connection, a magnet with armature and lever controlling the operation of the hooks or triggers, and a circuit for the magnet, substantially as set forth.

In testimony whereof we affix our signatures in presence of two witnesses.

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Witnesses:

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