

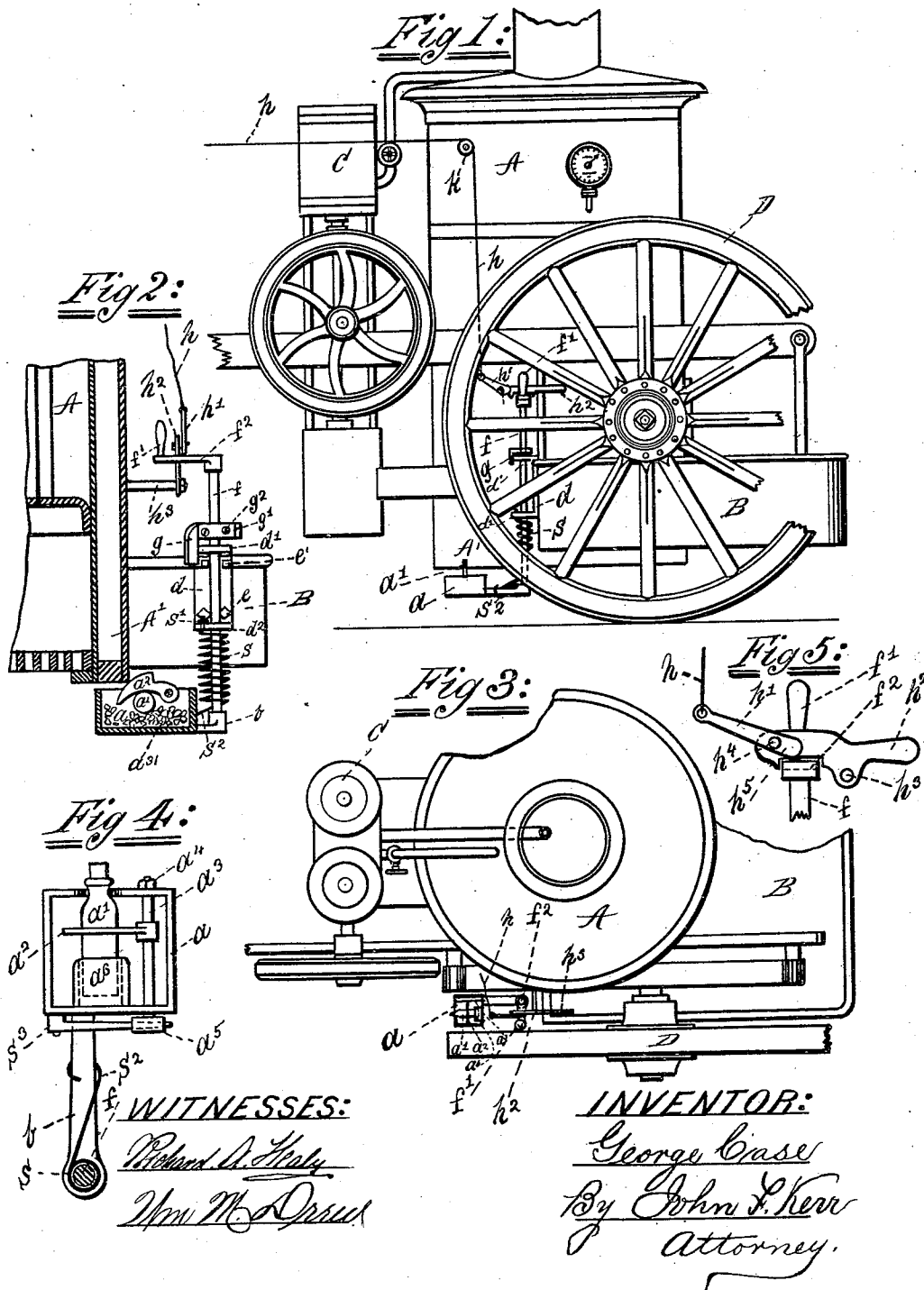
(No Model.)

G. CASE.

APPARATUS FOR IGNITING FIRE UNDER STEAM BOILERS OF STEAM
FIRE ENGINES.

No. 473,415.

Patented Apr. 19, 1892.



UNITED STATES PATENT OFFICE.

GEORGE CASE, OF PATERSON, NEW JERSEY, ASSIGNOR OF SEVEN-EIGHTHS
TO WOOD MCKEE, OF SAME PLACE.

APPARATUS FOR IGNITING FIRE UNDER STEAM-BOILERS OF STEAM FIRE-ENGINES.

SPECIFICATION forming part of Letters Patent No. 473,415, dated April 19, 1892.

Application filed December 1, 1891. Serial No. 413,668. (No model.)

To all whom it may concern:

Be it known that I, GEORGE CASE, of the city of Paterson, in the county of Passaic and State of New Jersey, have invented a new and useful Improvement in Apparatus for Igniting the Fire under Steam-Boilers of Steam Fire-Engines, of which the following is a specification.

I accomplish this by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is an elevation of part of a steam fire-engine, showing the application of my apparatus. Fig. 2 is a detailed vertical elevation of apparatus. Fig. 3 is a part plan of engine, showing location of apparatus. Fig. 4 is a part plan view of the same. Fig. 5 is a detailed elevation of the releasing or disengaging device.

The object of my invention is to rapidly and thoroughly light the fire in the boiler of a steam fire-engine at any moment that the necessity arises, when the engine is on its way to a fire or when leaving the engine-house, enabling the engineer in charge of the engine so to time the ignition of the kindling-fuel in the fire-box of the boiler that he may have steam at a good pressure when he arrives at the scene of operation without losing water by the steam blowing off or by steam being raised too early, and also saving the relaying of the kindling-fuel in the event of the fire not being lighted, as in the case of a false alarm or the fire being a slight one. The material forming the igniting material being made so inflammable and the arrangement of the pan containing the ignitor located directly under the center of the grate-bars insures a perfect and thorough lighting of the combustibles placed in the fire-box of the boiler. Another advantage is obvious—namely, that the fire can be lighted in the boiler by the engineer from his stand at the rear of the engine, and also by the driver from his seat on the driving-box, which is of inestimable value when the driver starts with the engine alone on a sudden call. I would mention that the means of lighting by a gas-jet under the fire-bars, which turns on full when the engine moves, and also the method of lighting by a torch applied through the fire-door on the top of the fuel are both uncertain,

as many causes assist their failure, such as wind, snow, dampness of kindlings, &c.

I will now proceed to more fully describe the construction of my newly-invented device.

A represents a boiler of a steam fire-engine C of the usual construction. At the lower portion or fire-box A' and inside of the wheel D is located the coal-box B, to which, by suitable bolts *e e'*, is secured at its end the frame *d*, Figs. 1 and 2. The frame *d* is provided with an upper projecting lug or arm *d'* and a lower one of similar form *d''*, both being provided with holes, through which the vertical rod *f* passes. Rod *f* is provided with a stop-collar *g*, with the arm *g'* secured to the collar *g* by the screws *g''*. The collar *g* rests on the upper lug *d'* of the bracket *d* and keeps it in position vertically. On the lower extremity of the rod *f* is secured an arm *b*, at the end of which is formed the lighting-pan *a*, which is formed square and moderately deep to receive the lighting material *a'* and the bottle containing igniting fluid *a'*, Figs. 2, 3, and 4.

On one of the inner sides of the box *a* is formed a hollow projection *a''* to receive the end of the bottle *a'*, its opposite end or neck resting in a hollow part formed in the upper edge of the opposite side of the box *a*, so as to support the bottle firmly some distance above the kerosene-soaked waste or kindling laid in its bottom, Fig. 2.

Forming part of the rod *a''* or suitably secured to the same is a catch or hooked breaker *a''*, which rests on the bottle *a'* when in position, and which is held in contact by the spring *S''*, operating on the spring-block *a''*. The rod is loosely inserted in holes formed in the sides of the box *a* and secured by the nut *a''*. On the upper part of the rod *f* is secured the handle *f'*, operating the device with its arm *f''*, Figs. 2 and 4. On the pivot *h''*, which is secured to a suitable part of the boiler, is a loosely-pivoted releasing-catch *h'*, with its handle *h''*, provided with an indented tooth to embrace the arm of the handle *h''*, and which when in engagement secures the same firmly, Fig. 5. At the outer end of the catch *h'* is a trigger or releasing-lever having a releasing-heel *h''* formed on one end and an eye to receive the cord *h* at the other. From the eye

of the catch h' a cord h is taken vertically to the roller or pulley k , over which it passes, and then is taken horizontally to the driver's seat in the front part of the engine, where it terminates, being provided with a loop and secured to a suitable hook. The catch h' is pivoted to the catch-arm or releasing-handle h^2 by the pivot h^4 , Fig. 5. At the lower end of the rod f and surrounding the same is a hollow spiral spring S , one end of which is secured by the nut S' to the lower arm d^2 of the bracket d . The other end S^2 is extended outward a sufficient distance and looped around the arm b , which it embraces firmly and gives to the arm b a motion, when the catch h' is released either by the cord h or the handle h^2 , Figs. 1, 2, 3, and 5.

I will now describe the operation of my newly-invented device. The handle f' of the lever f^2 is drawn forward until the pan a is clear from under the bottom A' of the boiler A by means of the rod f partly revolving in the arms d' d^2 of the bracket d , the spring s being at the same time placed in strong tension and imparting its gathered force to the arm b of the pan a by its loop s^2 . When in its right position, the indented part of the catch h^2 falls down over and secures the handle f' with its arm f^2 firmly, Fig. 3. The pan a is then filled with cotton waste a^{31} , well soaked in kerosene-oil and covered partially with a powder composition, which when attacked by the chemical solution that is contained in the bottle a' instantly produces vivid combustion. The bottle a' , containing the mixture or solution, is placed in the holder a^6 , with its neck resting on the opposite edge of the side of pan a , Fig. 2, the catch for breaking a^2 on its rod a^3 being raised to permit the insertion of the bottle a' , and lowered, so that the spring s^3 , operating on the block a^5 of the rod a^3 and breaker-catch a^2 , presses the bottle firmly and retains it in position free from vibration, due to the travel of the engine on its way to duty. The kindlings, coal, &c., being laid ready in the fire-box A' and an alarm or call being given for duty, the engineer may use his judgment as to the proper time to light up, whether in the house or on the road. In either event, to light the fire he depresses the handle h^2 , disengaging the handle or arm f^2 , with its handle f' , the springs being held stationary at one end by the nut s' , and securing the same to the arm d^2 of the bracket d allows the tension of the spring s to be discharged by partly revolving the rod f and throwing the pan a on the arm b under the boiler A' and nearly under the center of the grate-bars. During the revolution of the rod f and the swing of the arm b with the pan a the projecting part of the breaking-catch a^2 , which stands some distance above the pan a and above the lower edge of the fire-box A' of the boiler A , and which is formed tapering on its upper edge, is driven downward to allow its passage under the boiler, breaking the glass bottle a' , and its contents mingling

with the powder scattered over the kerosene-soaked waste instantly causes an intense and vivid flame, which, spreading itself all over the under side of the grate-bars, immediately ignites the kindlings and fuel placed in the fire-box of the boiler A . The combustibles in the pan a are sufficient in quantity and bulk to well insure the thorough lighting of the fire. In the event of the engine being taken out by the driver alone, at the proper time he pulls the cord h forward, which, by means of the roller k transferring a horizontal strain to a vertical one, lifts the end of the trigger-catch h' , which, being pivoted on the pivot h^4 , depresses the heel h^5 , which, forcing against the arm or lever f^2 of the rod f , raises the catch h^2 on its pivot h^3 , releasing the handle f' and arm f^2 , as before described. When the fire is well lighted, the pan a is drawn from under the fire-grate and the handle locked in position, as shown in Fig. 3, and the pan recharged with combustibles, &c., ready for another application, as described.

With this description of my invention, what I claim is—

1. In lighting apparatus for steam fire-engines, a frame provided with an upper and a lower projecting arm or lug, said frame secured to the end of the coal-box of a steam fire-engine or otherwise suitably located, said lugs or arms being provided with holes, a vertical rod passing through said holes, a stop-collar with arm secured thereto and resting upon the upper lug of said frame, an arm secured to the lower extremity of said vertical rod at the end of said arm, a lighting-pan formed to receive waste saturated with oil or other lighting material, one of the inner sides of said pan or box being provided with a hollow projection to receive the end of a bottle, the opposite side of said box having a hollow part formed on its upper edge to receive and support the neck of the bottle, a bottle containing igniting-fluid, placed horizontally in said lighting pan or box above the soaked waste or other material laid in its bottom, a rod loosely inserted in holes formed in the sides of said lighting-pan near one end thereof, one end secured by nut on the outside of pan, the other end having secured to it on the outside of pan a spring-block, a spring secured to the outside of said pan so as to operate on said spring-block, a hook-breaker forming a part of or suitably secured to said last-mentioned rod inside of the lighting-pan, said hook-breaker formed tapering on its upper edge and projecting above said pan and above the lower edge of engine fire-box and resting upon and held in contact with the bottle by means of the spring operating on said spring-block, an arm secured to the upper end of said vertical rod and provided with a handle, a releasing-catch provided with and connected by pivot to a handle, and an indented tooth to grip the arm of the handle secured to the vertical rod, loosely pivoted to some suitable part or portion of the engine-boiler, a releasing-lever or

trigger having a heel formed on one end and an eye on the other end to receive a cord, a cord secured to said eye, a pulley attached to engine-boiler, over which the cord is taken
 5 vertically and then horizontally to the driver's seat in front part of engine and there secured in any appropriate manner, a hollow spiral spring surrounding the lower portion of the vertical rod, one end looped about the arm
 10 which is secured to lower end of said vertical rod and the other end secured by a nut to the lower projecting lug on frame, all constructed as shown and described, and for the purpose specified.

15 2. In a device for kindling a fire in steam fire-engines, a vertical rod, an arm secured to the lower extremity thereof, a lighting-pan formed to receive waste saturated with oil or other inflammable material, secured to the
 20 end of said arm, one of the inner sides of said pan provided with a hollow projection to receive the end of a bottle, the opposite side of said pan having a hollow part formed on its upper edge to receive and support the
 25 neck of bottle, a bottle containing igniting-fluid placed horizontally in said pan above the soaked waste or other material laid in its bottom, a rod inserted loosely and horizontally through holes formed in the sides of
 30 said lighting-pan near one end thereof, one end of said rod secured by a nut on the outside of pan, a spring-block secured to the other end on the outside of said pan, a spring secured to the outside of said pan, so as to operate
 35 on said spring-block, a hooked breaker forming a part of or suitably secured to said last-mentioned rod inside of the lighting-pan, said hooked breaker formed tapering on its upper edge and projecting above said pan
 40 and above the lower edge of engine fire-box and resting upon and held in contact with the bottle by means of the spring operating

on said spring-block, said vertical rod being provided at its upper extremity with an arm and handle and mounted loosely in any frame
 45 or bracket suitably located and secured to engine, so that by turning the handle to throw the lighting-pan under the engine fire-grates the upper tapered edge of the hooked breaker will come in contact with the lower edge of
 50 the engine fire-box and cause it to break the bottle, as shown and described, and for the purpose specified.

3. In fire-igniting apparatus for steam fire-engines, a lighting-pan formed to receive waste
 55 saturated with oil or other lighting material, one of the inner sides of said pan or box provided with a hollow projection to receive the end of a bottle, the opposite side of box having a hollow part formed on its upper edge to
 60 receive and support the neck of the bottle, a bottle containing igniting-fluid placed horizontally in said lighting pan or box above the soaked waste or other material laid in its bottom, a rod loosely inserted in holes formed in
 65 the sides of said lighting-pan near one end thereof, one end secured by a nut on the outside of pan, the other end having secured to it on the outside of pan a spring-block, a spring secured to outside of said pan, so as to operate on
 70 said spring-block, a hooked breaker forming a part of or suitably secured to said last-mentioned rod inside of the lighting-pan, said hooked breaker formed tapering on its upper edge and projecting above said pan and above
 75 the lower edge of engine fire-box and resting upon and held in contact with the bottle by means of the spring operating on said spring-block, constructed substantially as shown and described, and for the purpose specified.

GEORGE CASE.

Witnesses:

JAMES RANKIN,
 JNO. S. MASCHAMP.