(No Model.)

O. A. HILLARD.

DISSOLVING KEY FOR STEREOPTICONS.

No. 588,429. Patented Aug. 17, 1897.

Fig. 1.

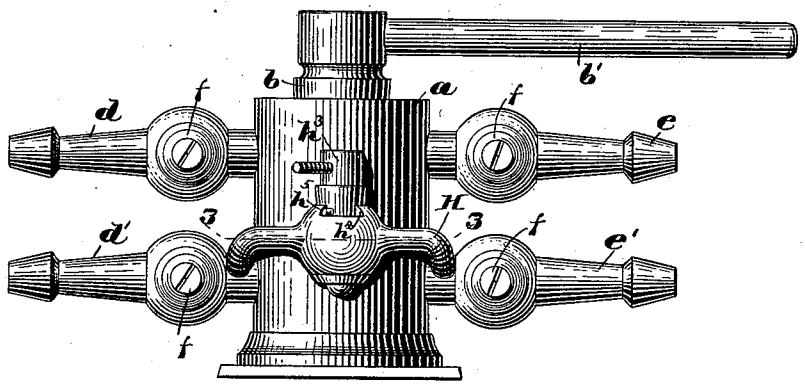


Fig. 2

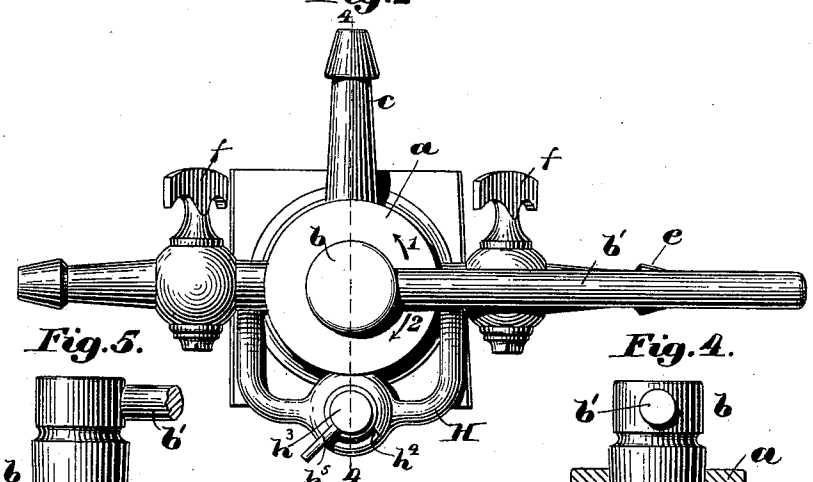


Fig. 5.

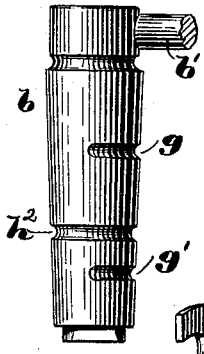
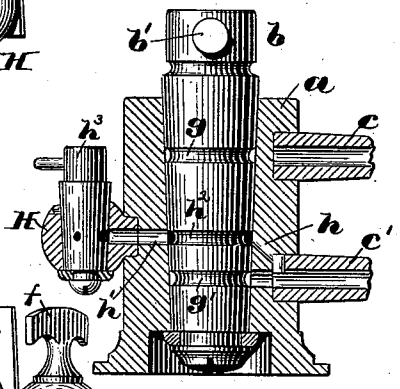


Fig. 3.

Fig. 4.



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UNITED STATES PATENT OFFICE.

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DISSOLVING-KEY FOR STEREOPTICONS.

SPECIFICATION forming part of Letters Patent No. 588,429, dated August 17, 1897.

Application filed February 17, 1897. Serial No. 623,776. (No model.)

To all whom it may concern:

Be it known that I, OSCAR A. HILLARD, of Boston, in the county of Suffolk and State of Massachusetts, have invented an Improvement in a Dissolving-Key for Stereopticons, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

My invention has for its objects to simplify the operation of stereopticons lighted by oxy-hydrogen-burners, to provide means whereby all danger, delays, and accidents in the handling of the gases are avoided, and also to materially save the gas, especially the oxygen.

For successfully exhibiting with the modern oxyhydrogen dissolving-view stereopticons it is necessary to have the services of an experienced and skilled operator, due to the delicate manipulation required of the gases. For instance, an inadvertent move of the supply-cock or increase in pressure of the oxygen will snap out or extinguish the flame, causing an awkward delay for relighting in the midst of a lecture, perhaps, or if the gases improperly mix or the cocks are misplaced, so as to stream up a hot fire or flame, endangering the instrument, it has been necessary to turn off the supply, extinguishing both lights and leaving the audience and speaker in total darkness.

By my invention I provide means to maintain a sufficient supply of hydrogen to keep a lighting-flame always present in the burner no matter what happens, so that the oxygen can be turned entirely off, and the main supply of hydrogen also may be cut off, or the exhibiting-flame may be snapped out in either or in both stereopticons without in the least disturbing or delaying the operation thereof, inasmuch as a lighting-flame will always remain in each apparatus ready to light up properly the moment the dissolving-key is turned in the right direction.

My invention includes a provision whereby the dissolving-key may be turned entirely around; also, it may be swung around repeatedly without danger of totally extinguishing the lights. Furthermore, by my invention I am enabled, upon reaching the lecture-hall and upon bringing the instruments in from the cold, to light a small flame of the comparatively cheap hydrogen for the purpose of warming up the condensing-lenses without any further attention and without the usual laborious shifting back and forth of the key-lever. Likewise the skilled and responsible person may accurately adjust the controlling supply-valves before the lecture, light the small hydrogen flame, turn the key so as to shut off all the gas controlled thereby, and then leave the apparatus to be subsequently operated by an inexperienced person, knowing that no disastrous consequences can ensue.

The details of my invention will be hereinafter more fully described in connection with the accompanying illustrative drawings, and the scope thereof will be defined in the appended claims, said drawings and claims forming parts of this specification.

In the drawings, Figure 1 is a view in rear elevation of my invention applied to a usual form of dissolving-key. Fig. 2 is a top plan view thereof. Fig. 3 is a horizontal section taken on line 3 3 of Fig. 1. Fig. 4 is a vertical transverse section taken on line 4 4, Fig. 2, the inlet-stems being broken off. Fig. 5 is a detail view in elevation of the plug.

My invention is applicable to any variety of key, but by preference I have illustrated it in connection with a dissolving-key, said key being shown as in general of the usual type, comprising a barrel *a*, plug *b*, operating lever or handle *b'*, inlet pipes and stems *c c'*, the former for oxygen and the latter for hydrogen, outlet-stems *d d'* for conveyance of the gases to one stereopticon, and similar stems *e e'*, leading to a companion stereopticon, the several outlet-stems being independently controlled by cocks *f* and having communication with the inlet-stems by passages registering with races *g g'*, extending approximately half around the plug *b*.

My invention contemplates providing an auxiliary or independent supply of hydrogen not depending for its control on the plug *b*, this supply in the embodiment of my invention herein illustrated being shown as led through a branch passage or by-pass H, opening freely into the stems *d' e'* and shunting the desired amount of gas from stem *c'* by ducts *h h'*, bored through the barrel *a*, reg-

istering with an annular race h^2 in the plug b, the by-pass II having, preferably, a three-way valve h^3, controlling the amount of gas delivered through the pass. When, therefore, the gases are turned on at the tanks, (not shown,) the lever b' being turned to the rear on the line 4, Fig. 2, thereby closing the main cock or plug, the operator will open the valve h^3 to permit a small stream of hydrogen to flow to the burner or burners of instrument or instruments. He will then light the burners, leaving these small flames to warm the instruments, if cold, in order to dissipate all steam and condensing moisture. Then the operator will turn the main cock b a quarter-turn to the right or to the left and carefully open the cocks f the amount required to produce a proper exhibiting-light, repeating the same operation for the companion instrument upon swinging the lever b' around a half-turn into a diametrically opposite position to turn the main supply of gases in that direction. Having properly adjusted the four cocks f, the operator may then again swing the main cock b' around to its original position, shutting off the races g g', thereby entirely cutting off the oxygen and extinguishing both exhibiting-flames, leaving, however, a small hydrogen flame in each burner, and may leave his instruments with no fear of danger to the apparatus and knowing that the hydrogen flames will maintain the instruments at the proper temperature and ready to be instantly thrown into full displaying action.

Heretofore it has been customary to have a knighted main cock—*i. e.*, a cock provided with limiting-stops, as shown at h^4 h^5, for the valve h^3—in order to prevent the accidental extinguishment of an instrument at an inopportune moment by inadvertently turning the main cock too far around, so that in case of accident, as by a flame streaming up dangerously, it became necessary to turn off the cocks f, thereby not only entirely extinguishing the burner, but also destroying the adjustments of the supply-cocks f and seriously discommoding the lecturer by the delay occasioned by relighting and by the readjustment of the gases.

My invention makes it possible to swing the lever b' wherever desired, turning the main cock full around and in any direction without occasioning any delay or vexation. Turning the lever b' half around in the direction of arrow 1, Fig. 2, dissolves from one stereopticon to the other without any intervening darkness, whereas a half-turn in the direction of arrow 2 dissolves with an intervening darkness, so that if an accident should occur requiring that the oxygen be turned off it can be done instantly by turning the main cock to its position of darkness, the light being instantly restored the moment the danger is removed simply by turning the main cock back again.

My invention provides means to always maintain a slight lighting-flame for the oxygen, yet the burners can never be burned out, because the oxygen will be turned off, excepting when lighting the screen, being turned off and on simply by swinging the lever b' around without altering any regulating valves or cocks.

Many other advantages and spheres of usefulness of my invention will be evident in the practical application and operation thereof.

While I have described the preferred embodiment of my invention, in which the subordinate passage for the hydrogen is located in and behind the key, this being a most compact and convenient arrangement, I have devised many other embodiments thereof, it not being vital that the "by-pass," as I have termed it, should have any connection with the barrel, plug, or with any particular part of the key proper.

Having fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a dissolving-key, the combination with the hydrogen-supply pipe, the several hydrogen-outlet pipes therefor and a main cock, of a by-pass connecting said outlet-pipes with said inlet-pipe independently of said main cock, and means to simultaneously regulate the flow of hydrogen from said by-pass to said outlet-pipes, substantially as described.

2. In a dissolving-key, the combination with the hydrogen-supply pipe, the several hydrogen-outlet pipes therefor and a main cock, of a by-pass for an auxiliary supply of hydrogen connecting said outlet-pipes with said inlet-pipe independently of said main cock, and a controlling-valve in said by-pass, controlling said auxiliary supply to two outlet-pipes, substantially as described.

3. In a key, having an inlet and an outlet for oxygen, and an inlet and outlet for hydrogen, a plug provided with a race for controlling the oxygen, a race for controlling the hydrogen, and an annular race independent of said other races, and a passage from said hydrogen-inlet communicating with said annular race and a passage thence communicating with said hydrogen-outlet, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

OSCAR A. HILLARD.

Witnesses:
GEO. H. MAXWELL,
JOHN C. EDWARDS.