W. H. ROBERTS.

SAD IRON.

APPLICATION FILED NOV. 3, 1909.

996,942. Patented July 4, 1911.

Fig. 2.

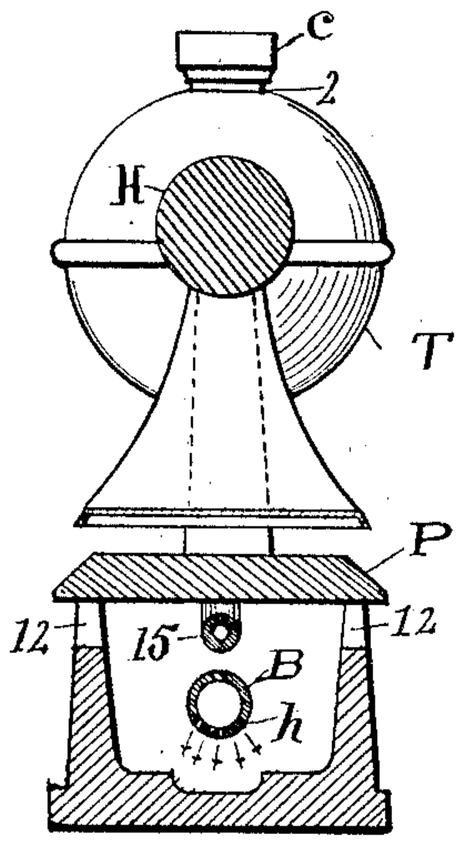


Fig. 1.

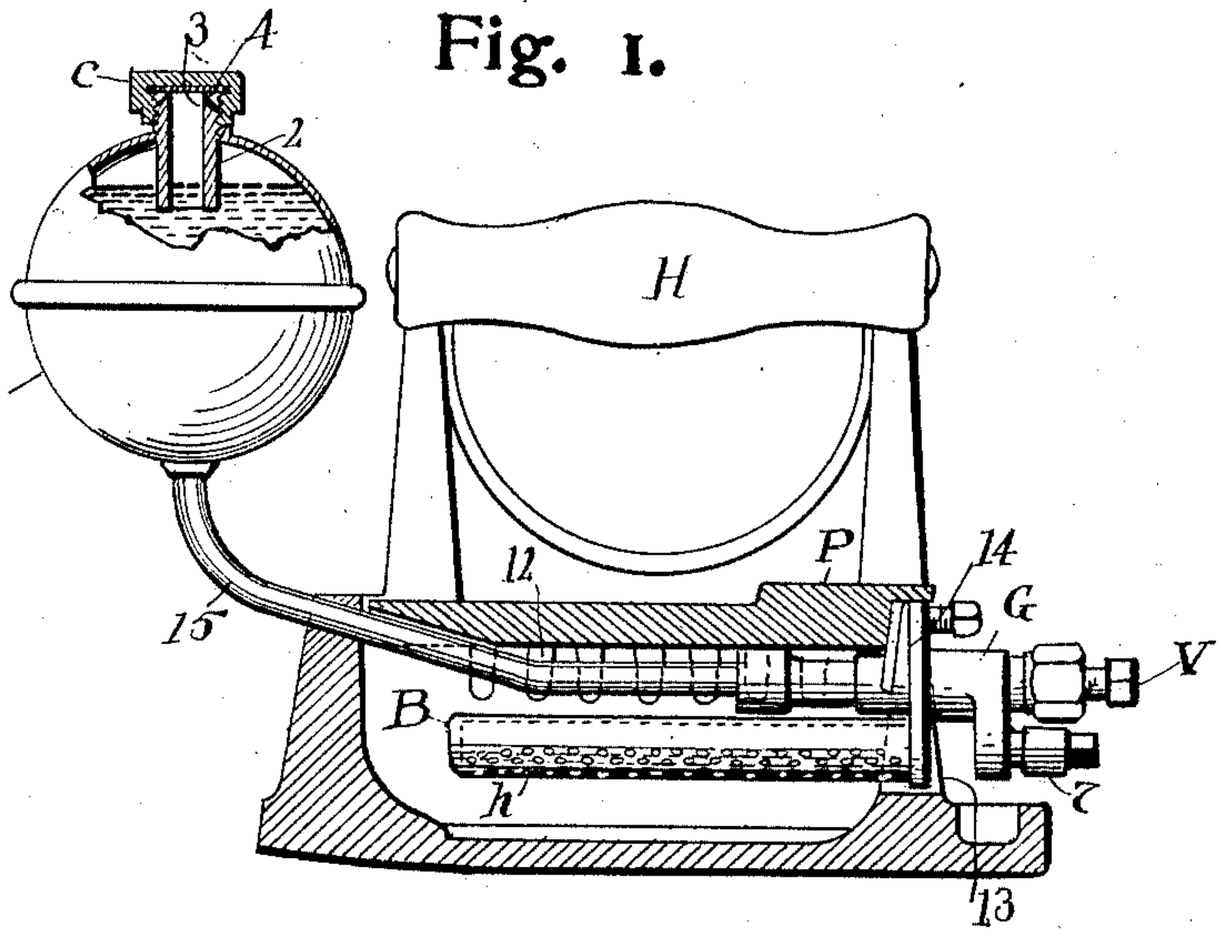


Fig. 3.

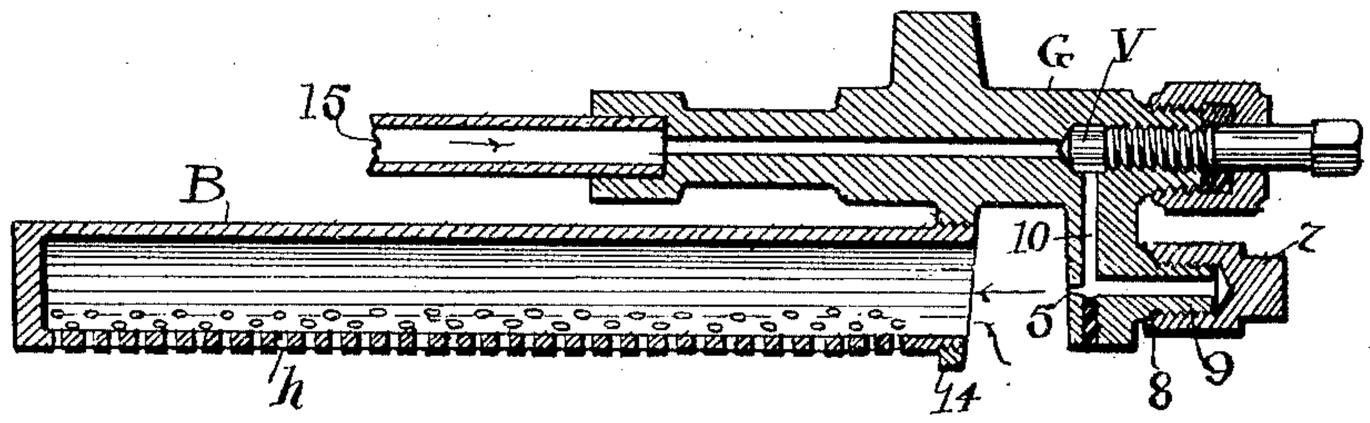
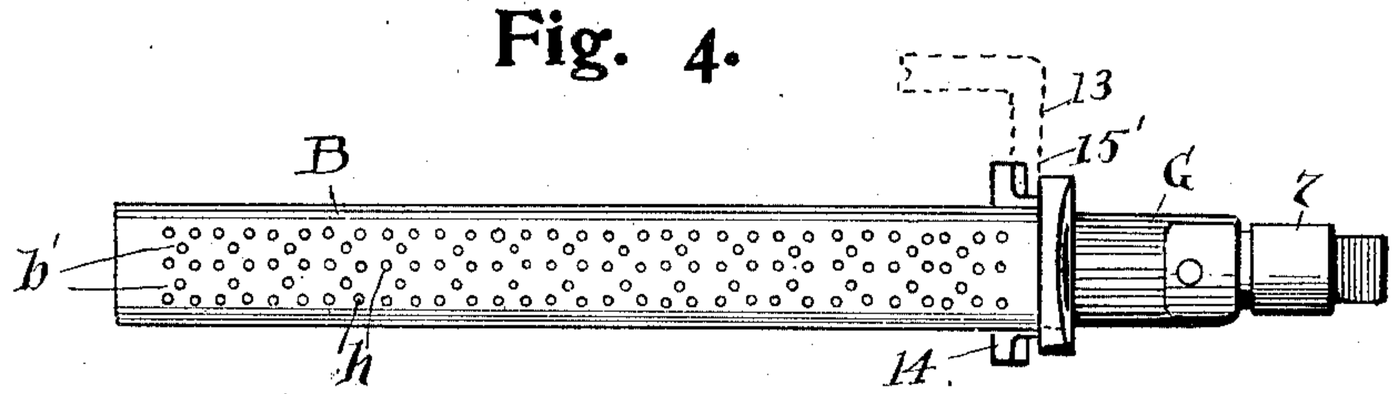


Fig. 4.



ATTEST

E. M. Fisher

F. C. Mueseun.

INVENTOR

WILLIAM H. ROBERTS.

BY Fisher & Wilcox ATTYS.

COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

WILLIAM H. ROBERTS, OF CLEVELAND, OHIO, ASSIGNOR OF ONE-HALF TO W. J. HOYNES, OF CLEVELAND, OHIO.

SAD-IRON.

996,942. Specification of Letters Patent. **Patented July 4, 1911.**

Application filed November 3, 1909. Serial No. 526,139.

To all whom it may concern:

Be it known that I, WILLIAM H. ROBERTS, citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Sad-Irons, of which the following is a specification.

My invention relates to improvements in sad irons, and the invention consists in a sad iron of the kind or style which have individual heating appliances connected therewith, all substantially as shown and described and particularly pointed out in the claim.

In the accompanying drawings, Figure 1 is a sectional elevation of the iron lengthwise thereof, and Fig. 2 is a cross section. Fig. 3 is a longitudinal sectional elevation of the main portion of the attachment, and Fig. 4 is a plan view of the attachment shown in Fig. 1.

The invention resides in several portions or parts of the iron including the burner tube B, the oil or gasolene tank T and the generator.

Having reference to the tank or vessel T for the oil, it is to be observed that the supply opening is provided with a nipple or tube 2 which extends into the said tank to a depth of say approximately one-fourth the entire depth of the tank, more or less, and outward beyond or above the surface of the tank a somewhat less distance or length but in any event sufficiently to secure the cap *c* firmly and closely thereon. To this end, that is to effect a seat for the cap which will seal the opening and prevent possible escape of vapor under pressure from within without outer means for sealing the same, I thread the said nipple about its outside to screw the cap thereon and provide the extremity of the nipple with a substantially knife or sharpened edge 3. This edge is adapted to come against the flat inside top surface of the cap or against the seating plate or disk 4 therein and perfectly seal the seat so that vapors cannot possibly escape. The said disk may be of a comparatively soft metal, such as copper or the like, or its equivalent, or if the cap itself be of brass or the like no disk may be required as the nipple is of comparatively hard steel and will make a seat closely in the cap under almost any conditions likely to obtain. The sealing of the said opening is of first importance for several reasons and particularly to prevent escape and waste of gas. Not infrequently such escape actually defeats the operation of the device without disclosing the fact of escape to the user but working embarrassment or inefficiency in operation notwithstanding, especially to the uninitiated. I have known irons equipped with this device to be returned to the seller or to the manufacturer as inoperative or worthless because of a slight defect in this particular—a leak of gas from the tank. Hence the importance of the construction shown and claimed. In this construction further precaution to prevent leakage and especially to obtain a steady pressure and flow of the oil is provided in the extension of the nipple or tube inside or into the tank and which serves the additional and possibly more important purpose of preventing overfilling of the tank with oil. When filling occurs the tendency is to continue to pour until overflow discloses that the tank is full, and yet for good reasons it is not desirable to start with a completely filled tank. By my improved construction and with the tube 2 extending down somewhat into the tank an air or gas chamber is formed approximately the full depth of said projection in the tank which cannot fill with oil. This also helps to seal the pouring opening or entrance as to the internal gas initially and lays the foundation for a pressure feed to begin with and which is maintained as the oil is consumed by liberated gases which rise and occupy the tank and continue the pressure and feed. Altogether, therefore, the foregoing improvement in the tank itself is highly important to the successful and satisfactory operation of the iron.

The second point of improvement lies in connection with the feed orifice 5 for the generated gas, shown as greatly exaggerated in size in Fig. 3. This orifice is so infinitesimally small that it can hardly be regarded as visible to the naked eye and the gas produced in generator G is injected into the burner tube across the intervening area through this orifice. Heretofore it has been a problem how to render this orifice available from the rear to cleanse it of obstructions and which will accumulate despite all precautions. Even deposits from the gas or oil will accrue if there be no other cause. To get at such deposits at said orifice a cap

corresponding to 7 has been used, and some have tried solder in or about the inside of said cap, while others have tried different kinds of packing, but the solder was liable to melt and run into the orifice and particles from the packing would escape and get therein. With knowledge of these untoward experiences I was led to devise the means herein shown and which consist in a ground seat between the flaring inner end of the said cap 7 and the conical seat 8 therefor on the base of the nipple 9. By getting a perfect metallic fit of this kind at this place I am enabled to seal the connection and avoid the necessity of using materials that will slough off and foul said orifice. The valve V above controls the flow of the gas to said orifice in and through duct 10.

Finally the invention resides in the burner B. As to this burner or burner tube the same is shown as provided with orifices or holes *b'* and *h* evenly scattered in a longitudinal and transverse direction over its bottom from end to end, and is supported at its open outer end in a depending portion from generator G. Of course I am aware that it is not new in any broad sense to perforate a burner tube of this general kind for use in a sad iron, but so far as I know and believe it is new to provide a tube with perforations having the novel arrangement and size or proportions and numbers substantially as shown herein in connection with the orifice 5 of the exceedingly small size and the oil supply as described. For example, I have found that the operation of my device can be entirely defeated by comparatively slight and seemingly immaterial changes in either the size or the arrangement of the said perforations. Take say three or four rows of perforations of the same relative size as those shown herein and the device will not work. That is it will not work practically or so that it will be commercially acceptable because of its imperfect combustion. Of course the area of perforation is limited to about the width shown because it will not do to throw the jets and flame laterally against the sides of the iron. Instead it must be directed downward to the bottom of the iron. Now I have found that unless there is just the right measure or size and distribution of perforations with a given size of orifice and pressure there will be inevitable failure on account of imperfect combustion. For example, a burner tube with three rows of perforations of the same relative size or proportion as those shown will not work in my sad iron because combustion will be so imperfect that the odors of the escaping gases will render the iron offensive if not really dangerous to health. I have therefore worked out the problem of perfect combustion in a tube of this kind in its relation to or with the vapor supply and generating devices and find that by distributing the said perforations over the bottom of the tube in size, number and relation substantially as shown I get absolutely perfect combustion of the gas with no odors whatever arising from the burner. Now, it will be obvious that several conditions enter into this result or attainment and between which there necessarily must be perfect correspondence. Thus, a total or aggregate area of perforations in a given length of tube works perfectly with a given size of gas orifice 5 under a given pressure and with the right sort of burner chamber wherein combustion occurs. These four several conditions obtain in the construction shown, wherein the iron presumably is of the usual size, say six pounds or about six inches in length and the burner tube about four and a half inches in length. The perforated area of the tube is about three-eighths of an inch wide and there are about one hundred and twenty-five (125) perforations of fifty four (54) standard drill. The orifice 5 is about 9500 to 10000 micrometer measure, and the burner chamber containing the tube is closed about its bottom and sides up to the draft or exhaust holes 12 along its top and sides. The rear end of the iron has a wall 13 which is provided with a central ribbed opening into which the apron 14 on the generator fits snugly at its sides, and the burner tube is open its full width at this end and supported in said apron. Therefore when the parts are assembled the burner chamber is really closed against the entrance or admission of air and combustion proceeds therein entirely upon or with the mixture of air and gas obtained in said tube and issuing into said chamber through the perforations *b'* and *h*. The burner tube is about half an inch across. Of course the figures and proportions given are not meant to be arbitrary but after all there cannot be any material variance in any one particular while the others remain unchanged without correspondingly impairing the operation or possibly defeating it altogether. Of course in a larger iron the proportions would all be correspondingly larger and as long as portions are kept relatively the same throughout, large or small, the iron will work acceptably.

The gasolene tank is mounted rigidly on the generator by pipe 15, and the generator is supported in the iron by a ribbed or flanged construction at the side edges of the apron 14 engaging with the edges 15' of the opening in rear wall 13 of the iron. The said parts can therefore be bodily removed together from the iron when the top plate P which carries handle H, is lifted off.

Referring to Fig. 4, this further peculiarity of arrangement and disposition of open-

ings b' and h in tube B may be noted, to wit,—that the two outer and middle rows of openings are approximately double in number to the two intermediate rows of openings designated by b', and that every two successive openings h in the middle and outer rows have but one opening b' adjacent thereto and centrally located as to the opening on either side thereof. This arrangement is the preferred one because it has been found to give the most satisfactory results.

What I claim is:

A sad iron comprising a generator, and a burner tube communicating therewith provided with a series of parallel rows of perforations at its bottom, said perforations being uniform and equidistantly spaced apart in both a transverse and longitudinal direction, a series of parallel rows of perforations extending in a longitudinal direction between said first named rows of perforations, said last named perforations being located opposite the spaces between alternate pairs of the first named perforations whereby the jet of flame issuing from one of said perforations is prevented from spreading and intermingling with the jet issuing from the next adjacent perforation.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM H. ROBERTS.

Witnesses:

E. M. FISHER,

F. C. MUSSUN.