

to force air into the generating-chamber, and is herein shown as provided in connection with the auxiliary tank I by providing a suitable bell I' within the said tank, together with suitable air inlet and outlet pipes  $i^2$  and  $i^3$ . The outlet-pipe  $i^3$  leads from the upper part of the bell I' to a point in the generating-chamber below the normal water-level, so that it is ordinarily sealed thereby, and said pipe is also provided with a suitable valve  $i^4$ , as shown in Fig. 4, by which any back pressure of gas will be prevented when the pump is operated without regard to such seal. The inlet-pipe  $i^2$  leads from the outer air to a point in the bell above the level of the water in the tank and is also provided with a valve  $i^5$ , by which any outflow through said pipe is prevented. With this construction it will be obvious that when the bell is reciprocated air will be drawn in through the pipe  $i^2$  at each stroke and alternately therewith will be forced out through the valved outlet-pipe  $i^3$  into the generating-chamber. When it is desired to recharge the apparatus, it is therefore only necessary to drain off the water in the generating-chamber until the relief-pipe G is uncovered and to then operate the air-pump described until all gas remaining in the generating-chamber has been forced out through said relief-pipe in order to completely prevent such gas from escaping into the apartment when the generating-chamber is opened. The capacity of thus being recharged while in full operation, so far as supplying gas to the burner is concerned and without affecting in any way the lights at said burners, without requiring any duplication of apparatus, and in a manner avoiding all possibility of fouling the atmosphere of the room or building with the odors of acetylene gas, is one of the most important practical features of my improved generator, although the main feature of the invention consists in the broad idea of regulating the generation according to the demands of consumption by admitting the water-supply to the generating-chamber at a point below the carbid-support under a determinate head or water-column acting in opposition to the pressure of gas generated as influenced by an expansible gas-receiver arranged to produce an increasing pressure with increased capacity, and I desire to be understood as comprehending within my invention any form of apparatus in which regulation is thus effected. The means for providing the increased receiver-pressure may obviously be varied widely and may include any arrangement of weights or springs or other pressure-increasing devices found convenient, although the arrangement hereinbefore described is practically convenient and effective for the purpose.

A further feature of practical importance is that the operation of replenishing the carbid involves at the same time the removal of the waste or residuum thereof, so that it is impracticable for the carelessness of an at-

tendant to permit the generator to become foul and clogged thereby. Furthermore, the construction is such that whatever volume of air enters the chamber during the recharging operation is completely mixed with a vastly-larger volume of gas contained in the receiver and mixing-chamber before described, and the burners consequently do not show a blue flame after the recharging operation, as would otherwise be the case. In passing from the generator to the mains the path of the gas is so circuitous that such thorough mixing of the air and gas is insured, and inasmuch as the gas is removed from contact with the water immediately upon leaving the generating-chamber and is exposed in its passage to the mains to a large area of wall-surface, much of which is exposed to the outer air and a large portion of which is water-jacketed, all moisture becomes condensed as the gas is cooled, and said gas enters the mains in a dry condition and at a temperature but little above that of the surrounding atmosphere. Additional devices for cooling and drying the gas may obviously be provided, but in practice have proved unnecessary. The absolute safety of the generator is insured by the relief-pipe leading from the generating-chamber, which limits the pressure ordinarily to but a few ounces per square inch. The water seal around the gas-holder will be replenished from time to time, as found necessary, but is maintained in a large degree by the moisture which condenses on the walls of the receiver and trickles downwardly into the sealing-chamber.

In Figs. 8 and 9 I have shown a construction for limiting the height of water in the water-chamber which may be used as an alternate construction to the adjustable vent heretofore described. The overflow-pipe J is bent at its inner end at an angle to its main body portion, which passes through a stuffing-box  $j$  in the same manner as the vent-pipe B<sup>4</sup>. Said pipe J is, however, located some distance below the top wall of the water-chamber, and its open inner end may be raised into the vicinity of said top wall or may be turned down into the horizontal plane of the stuffing-box to limit the level of water, as desired, the position of the overflow being determined, as in the previous construction, by the indications of a pointer or handle J' on an adjacent scale. The filling-nozzle in this case conveniently consists of a half-funnel J<sup>2</sup>, soldered to the outside wall of a tank and opening into the water-chamber at its lower end or apex. When water is poured into the funnel, the pipe J will obviously serve first as a vent and then as an overflow after its open end is submerged, so that no matter how much water is poured into the chamber it will speedily run off to the level indicated by the pointer on the gage or scale. The outer end of the pipe is further herein shown as provided with a whistle  $j'$ , which will sound until the inflowing water rises to the level of



# UNITED STATES PATENT OFFICE.

CECIL M. DURNELL, OF INDEPENDENCE, MISSOURI, ASSIGNOR TO DANIEL C. HALLERAN, THOMAS W. MILNER, AND THOMAS A. BRADY, OF SAME PLACE.

## COMBINED SKIRT FASTENER AND SUPPORTER.

SPECIFICATION forming part of Letters Patent No. 626,273, dated June 6, 1899.

Application filed March 31, 1898. Serial No. 675,909. (No model.)

*To all whom it may concern:*

Be it known that I, CECIL M. DURNELL, a citizen of the United States, residing at Independence, in the county of Jackson and State of Missouri, have invented a new and useful Combined Skirt Fastener and Supporter, of which the following is a specification.

This invention is designed most especially to provide a secure fastening for ladies' and misses' skirts and prevent the unclasping of the waistband thereof when the skirts are worn.

The object of the present invention is to simplify the construction of means for uniting the ends of a skirt-waistband together and for connecting the waist or dress-body to the waistband-coupling in a manner to prevent disengagement of said members of the waistband connection; and a further object is to provide a yielding connection between the waistband-fastener and the dress-body or waist, so as to afford a yielding suspension of the waistband-coupling of the skirt.

With these ends in view my invention consists of a skirt or waistband fastener comprising the companion skirt-plates, having means for interlocking them together, and also provided with slots arranged to coincide when the plates are overlapped, a third plate having a hook to engage with the registering slots in the companion skirt-plates for the purpose of coupling them against endwise movement one upon the other, and a suspension elastic or tape attached to said third plate and adapted to be fastened to a waistband to afford a resilient suspension device for the plates and the skirt coupled thereby, all as will hereinafter more fully appear.

For a full understanding of the merits and advantages of the invention reference is to be had to the accompanying drawings and the following description.

The improvement is susceptible of various changes in the form, proportion, and the minor details of construction without departing from the principle or sacrificing any of the advantages thereof, and to a full disclosure of the invention an adaptation thereof is shown in the accompanying drawings, in which—

Figure 1 is a detail view showing the appli-

cation of the invention. Fig. 2 is a detail view of the fastening and lock therefor. Fig. 3 is a detail view of the parts shown in Fig. 2 separated and disposed in a group.

Corresponding and like parts are referred to in the following description and indicated in the views of the drawings by the same reference characters.

The fastening comprises a plate 1, having a slot or opening 3 at one end and a slot or opening 4 near its upper edge, the two slots 3 and 4 being disposed at right angles to each other. A plate 2 is provided with a hook 5 at one end to engage with the slot 3 of the plate 1 and has a slot or opening 6 at its upper edge to register with the slot 4 of the plate 1 when the two plates 1 and 2 are in engagement. The hook 5 is an integral part of the plate 2 and is pressed therefrom. The plates 1 and 2 have openings to receive the stitching by means of which they are secured to the end portions of the waistband 7 of the skirt 8. Obviously said plates may be provided with securing means of any variety for attaching them to the waistband.

A plate 9, having a slot 10 at its upper end and a projection 11 at its lower end, is secured to the waist or other garment above the waistline by means of an elastic tape or webbing 12 and is designed to engage with the skirt-fastening and prevent the skirt from sagging or dragging. The projection 11 may be of any form and is adapted to pass through the registering slots or openings 4 and 6 of the overlapping end portions of the plates 1 and 2, so as to prevent unsnapping or disengagement of the parts of the fastening when engaged. As shown, the projection 11 is a hook and is of a width corresponding to the length of the slots 4 and 6, so as to prevent any appreciable longitudinal play of the plates 1 and 2 when coupled.

When the skirt is worn and the plates 1 and 2 are coupled together, the slots or openings 4 and 6 thereof come into coincident relation, and after the projection or hook 11 has been passed through the said registering slots the fastening cannot become accidentally disengaged or opened.

From the foregoing description it will be



means for supplying water to the generating-chamber at a point below the carbid-support.

21. In a gas-generator, a closable generating-chamber extending into a closed ventilated water-supply chamber provided with means for determining the head of water contained therein, and connected therewith by a valved opening for hydrating the charge of carbid by means of said head of water, and having a relief-pipe normally closed by the water in said generating-chamber.

22. In a gas-generator, a generating-chamber extending within a water-chamber and connected therewith by a valved passage, means for adjustably varying the head of water in said water-chamber, a carbid-support within the generating-chamber above said opening, and a connected expansible gas-receiver affording increased pressure with increased capacity.

23. The combination, with a generating-chamber and an expansible gas-receiver provided with means for affording an increased pressure with increased capacity, of a substantially plane primary carbid-support of open-work, inclined from the horizontal, and means for supplying a head of water to the chamber at a point below the carbid-support.

24. The combination, with a generating-chamber, of a primary carbid-support, consisting of an upper grating to receive the charge, and a lower grating of finer mesh but coarse enough to permit the fully-slaked carbid or lime to fall freely through it, arranged immediately beneath, parallel with and in close proximity to the upper grating, means for supplying a head of water to the chamber at a point below the carbid-support, and a gas-receiver connected with the chamber.

25. The combination, with a generating-chamber, of an inclined primary support for calcic carbid, consisting of an upper grating for the reception of the original and regular charge of carbid, and a lower grating of finer mesh but coarse enough to permit the fully-slaked carbid or lime to fall freely through it, arranged immediately beneath and parallel with the upper grating.

26. In an acetylene-gas generator, the combination with a generating-chamber having a primary carbid-support consisting of an upper grating which receives the charge and a lower parallel grating of smaller mesh in proximity thereto, means for supplying a head of water to said chamber from beneath the carbid-support, and an expansible gas-receiver provided with means for affording with increase of capacity an increase of gas-pressure acting in opposition to said head of water to regulate its height relatively to the carbid-support.

27. An acetylene-gas generator, provided with a generating-chamber containing an inclined primary carbid-support consisting of an upper grating to receive the original and regular charge of carbid and a parallel lower grating of finer mesh immediately beneath and in proximity thereto, means for supplying a head of water to said chamber from below the charge of carbid, an expansible gas-receiver, and an increasing resistance automatically applied to the receiver as its capacity increases to afford a variable pressure acting in opposition to the head of water to control or depress its level relatively to the carbid-support.

28. In a gas-generator of the class described, a closable generating-chamber, a removable drawer having a carbid-support and also constructed to retain the residuum, said generating-chamber being constructed to contain said drawer and also having a valved connection with a water-supply at a point below the level of the carbid-support, an independent valved discharge-opening arranged to drain the generating-chamber, and means for forcing air into the chamber to displace the gas therein.

In testimony that I claim the foregoing as my invention I affix my signature hereto, in the presence of two subscribing witnesses, this 16th day of July, A. D. 1898.

AUGUSTINE DAVIS.

Witnesses:

H. W. CARTER,

ALBERT H. GRAVES.