Manufacture of Gas. Patented June 23, 1854. By THOMAS ISAAC DIMSDALE.*

This invention has for its object to increase the volume of the gas obtainable from carboniferous or bituminous substances, by means of a novel mode of applying known chemical principles to the production of gas for both heating and lighting purposes. The production of gas for both these purposes is effected by one continuous operation, and in a simpler, cheaper, and therefore more practical way (consistent with the easy adaptation of the invention to the existing apparatus in gas works) than has hitherto been done. The decomposition of water when heated to various degrees by passing it over incandescent charcoal, to obtain hydrogen gas and otherwise, as auxiliary to these purposes, has not been hitherto effected in a manner to bring the process into anything like general use. One difficulty has been the high value of charcoal, which, by the great majority of experienced gas manufacturers, has been found to render the cost of obtaining the gas, greater than when coals are employed in the usual method.

In carrying out this invention, steam is generated in an ordinary low-pressure steam-boiler, and it is conveyed by a horizontal iron pipe immediately over or under the groups of retorts, as they are now arranged in gas manufactories. This pipe may be well covered with felt, or any substance which is a non-conductor of heat, in order to prevent the steam from experiencing any material loss of temperature during its passage along the pipe. From this horizontal pipe smaller perpendicular short branch pipes, provided with stop-cocks, are made to ascend or descend towards the centre of the retorts. These branch pipes are to be connected, by a screw-joint, with a pipe passing through the lid or top of the retort, along the top inside, then down at the back, where the pipe is divided into three pipes that pass along the bottom. These bottom pipes are perforated with very fine holes underneath, so as to permit the escape of steam, and their ends are closed. When the retorts are not at work, the small perpendicular pipes can be disconnected from the pipes in the retort and taken off; and the stop-cocks close to the horizontal pipe being turned off, all escape of steam will be prevented. The retorts are to be charged, in the usual way, with bituminous shale or schist, boghead, cannel, or ordinary coal, and heated precisely in the manner now done. When the retort has become thoroughly hot, and the mass of the substance within heated through, or nearly through, to a red heat, the stop-cocks communicating with the horizontal steam-pipes are to be turned on, and the steam admitted: the result of this will be, that the steam will become super-heated in its passage through the pipe placed inside at the crown or top of the retort, and after descending through the pipe at the back of the retort, the super-heated steam will ascend through the incandescent mass in the retorts from the small apertures pierced in the lower pipes. The steam will be thereby decomposed, and hydrogen and oxide of carbon gases be evolved, which will combine with and increase the volume of gas being produced by the destructive distillation of the substance with which the retorts have been charged. From bitu-

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minous coal, schist, or shale, a thick heavy gas is produced, rich in illuminating power, and the addition of the hydrogen and oxide of carbon gases, will not materially diminish the illuminating power, and by no means in proportion to the increase of volume they afford. Up to a certain duration of the process (being nearly that at which the operation would cease for making gas under the old and usual mode) the increase obtained in volume will vary in amount, according to the quality of the substance with which the retort is charged, from twenty to thirty per cent., before any apparent diminution of lighting power will occur, or so as to render the gas unsuitable for illuminating purposes. When the decrease in lighting power has reached to this point, the communication between the retorts and the gas holders, which received gas intended for lighting, is to be shut off, and the gas subsequently produced should be conveyed into a separate gas holder, which gas will now be applicable to heating purposes. This gas will be of greater heating power than carburetted hydrogen; and the quantity produced by the continued passage of the super-heated steam through the incandescent mass in the retorts, will amount to more than the volume of the lighting gas transmitted to the first gas holder. Thus, assuming that the quantity of gas which would have been yielded under the old and ordinary process of gas making, to be nine thousand cubic feet per ton of ordinary coal, the quantity suitable for lighting purposes will be increased up to nearly eleven or twelve thousand cubic feet, and the produce from bituminous schist or shale, augmented from five thousand or six thousand to seven thousand or eight thousand feet; and the quantity of gas for heating purposes yielded besides, will be at least an equal quantity more. If the material to be carbonized be peat, lignite, or other carbonaceous substance, yielding gas of feeble illuminating power, it may be saturated previous to being put in the retort, or partly saturated, with any dissolved resinous, oleaginous, or fatty matter, or a proportion of boghead coal mixed therewith, with or without such saturation, and then heated in the manner above described. The ash or charcoal of boghead coal or shale, which has been perviously used and exhausted of all the gas it will yield suitable for lighting, may be again used for producing gas for heating. The charcoal obtained from lignite, peat, or wood, when in an incandescent state, being capable of decomposing the steam of water, may all be used in the above described manner for that purpose; and if the gas be required for illuminating purposes, it may be carburetted by putting into the retort with these matters, dried peat in small lumps, or pulverized sawdust, or ground charcoal saturated with any oleaginous, fatty, resinous, or tarry matter, or with naphtha. The fatty, oleaginous, resinous, or tarry matters should be mixed with the dried peat, sawdust, charcoal, or other solid carbonaceous substances, before the latter are placed in the retort, and not added thereto while in the retort.

Claims.—The method described, of operating upon carbonaceous or bituminous substances (capable of yielding combustible gas for lighting and heating), by the introduction into the retort, during the process of distillation, of jets of super-heated steam, for the purpose of decomposing the same, and causing its elements to combine in a nascent state with the gases evolved from the carbonaceous or bituminous substances contained

in such retort. Also, mixing with solid carbonaceous matters, as above set forth, fatty, oleaginous, or resinous substances, previous to the same being placed in the retorts, for the production of gas.

*Aluminium, the so-called New Metal.**

Marvels (if we may judge from the eager manner in which they are received by the bulk of mankind) are the natural food for the sustenance and quickening of many minds. There are few among us who cannot testify to the charm of a really marvellous story. It is indeed quite vexing, while soaring pleasantly in imagination, far from facts and figures, to be brought suddenly, by some friendly monition, into the presence of stern realities, and thereby convinced that we have been merely dreaming. If, however, we do not desire to have our visions thus rudely dispelled, we must choose for our ruminations some field which will not admit of the facile demonstration of the impracticable or impossible. In short, it is injudicious, whatever custom may say to the contrary, to feed the marvellous vein of craving humanity with fictions based upon supposititious progress made in the applied sciences; and that for the simple reason that the deceit, whatever it may be, is so readily discoverable. This, we think, is well understood by all persons engaged in practical science; for whatever class else of the community may take on trust the announcements of wonderful discoveries put forth from time to time, whether they relate to flying machines, the long range, or perpetual motion, we are sure it is not the followers of chemistry or mechanics who place the slightest faith in such fictions. They, however, are subject to fall into an error of an opposite kind, and distrust the value of every suggestion that has not been put to actual trial. This is more especially the case when very important advantages are declared to be attainable by the adoption of some new proposition; for knowing, by experience, how gradual has been the progress in the arts, practical and scientific men are unprepared for great changes; and thus, from their discrediting unattested statements, many valuable discoveries have long been kept in abeyance.

The recent proposition for the adoption into the arts of the metal aluminium, has afforded to the lovers of the marvellous a new subject for speculation. Already its adaptability to a hundred cases is proclaimed, although the difficulty of obtaining it is at present a bar to its use. It is sufficient that the compounds of the metal are capable of being reduced and made to yield the pure metal; that the metal thus obtained is white, tough, not readily oxidizable, and has a lighter specific gravity than iron: and from these facts a world of probabilities as to its ultimate range of application, has been put forth. We remember, some years ago, when the great and unexpected yield of copper at the Burra Burra mines affected, for a time, the market price of that metal, the public was promised penny-pieces as large as dinner plates. But, far from that, copper has actually advanced in price, and that to a permanent and inconvenient degree; while gold—notwithstanding the prophecies respecting the change which the enormous additions made to it of late

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