

It may be observed, that in some of these experiments the water must have been employed to disadvantage; and that, by increasing the height of the water much further than the above limits, in the same machine, we could not expect to produce proportionate augmentations of the force of the blast: for if a certain quantity of water, running with a certain velocity through the choak, be supposed to fill the bore of the pipe, a less quantity, with a less velocity, must leave a vacancy, which will suffer part of the air to escape; and a greater quantity, with a greater velocity, must have some part of it spent ineffectually, for want of sufficient room to spread. Some experiments, to be mentioned hereafter, afford a clear proof of this.

[TO BE CONTINUED.]

ENGLISH PATENTS.

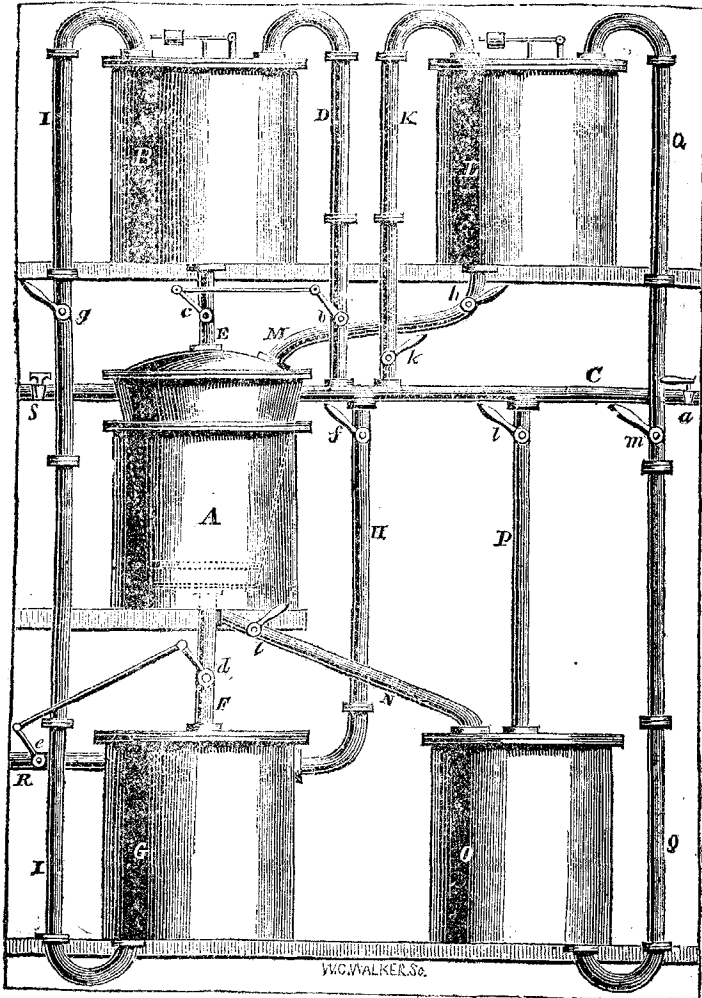
Account and Description of S. W. WRIGHT'S Patent Machinery, and Process for Washing and Bleaching.

By this apparatus, the several processes of washing, cleansing, bleaching, and drying, are almost wholly effected by the simple agency of high pressure steam, without the goods being submitted to *rubbing*, so injurious to most fabrics, but especially to those of fine texture. The steam is made not only to act a chemical part in the several operations, but by its expansive force to perform a mechanical one also; to fill, to discharge, and to re-fill at pleasure, a series of vessels with the fluids required in the successive processes; and all these changes are effected, without any other manual aid, but the occasional turning of a few stop-cocks.

The accompanying diagram, must be considered as illustrative of only one eligible mode of performing the operations, as the form and disposition of the vessels, and other parts of the apparatus, may be varied according to circumstances. By this arrangement, the goods to be cleansed, or bleached, are first packed closely into a conical vessel, through which steam is, for a while, caused to pass; the steam is next made to force an alkaline solution through the goods, in order to remove the impurities, or colouring matter, (which operation is repeated as often as may be judged expedient;) hot water is then impelled through the goods, to remove all the alkaline matter; ultimately, steam of a high pressure is forced through to expel the water; the goods are, by this last operation, left nearly in a dry state, and perfectly clean. A subsequent process, that of introducing blasts of cold air through the goods, may also be employed, by which their whiteness will be further improved.

A, is a copper vessel, formed as the frustrum of a cone, at the lower part of which is a perforated false bottom or grating, and below this, the real bottom, from whence a pipe descends. The cotton, linen, or other articles to be operated upon, having been previously soaked in water and rubbed over with soap, are to be closely

packed in this vessel, the lid of which is then to be screwed down and rendered steam tight at the junction. In the diagram, this conical vessel is shown, surrounded by a jacket, to prevent the radiation of the heat, but this addition, the patentee does not consider to be absolutely necessary. B is a vessel (which is also of copper, as well



as the other vessels and tubes represented,) containing soap and water, or the usual alkaline solutions of pearl-ash, soda, &c.; C is a pipe leading from a steam boiler, through which is introduced steam, that has been raised to a pressure of 50 lbs. upon the inch, which is at first to be gradually admitted into the apparatus, by partially

opening the stop-cock, *a*, when it passes into the vessel *A*, where it is allowed to act upon the goods therein deposited, for half an hour; after which, the cock *a* may be completely opened, and the full force of the steam be allowed to operate, first, opening the cocks *b*, *c*, *d*, *e*, when the steam will pass up the pipe *D*, into the vessel *B*, containing the alkaline solution. The pressure of the steam upon the surface of the liquid in this vessel, will now cause it to descend through the pipe *E*, into the vessel *A*, and herein, the steam continuing to press, will force the alkaline liquid through the goods, saturating every part, and carrying dirt and other impurities to the bottom, the liquid passing off through the pipe *F*, into the receiver *G*, underneath.

The pressure of steam is next employed to re-fill the vessel *B*, with the discharged alkaline liquor; for this purpose, the cocks, *b*, *c*, *d*, *e*, are to be closed, and the cocks *f* and *g* to be opened; the steam will now pass down the pipe *H*, and operate with its full pressure upon *G*, thereby forcing the liquid up the pipe *I* *I*, again into *B*; from whence it is forced again through the goods in the vessel *A*, repeating the operation as often as it may be found necessary, in order to perfectly cleanse them; the number of times it will require, will depend upon their degree of foulness, &c. which can only be determined by experience: for the ordinary washing of body linen, twenty times have been found sufficient.

Having now removed all the dirt and other impurities from the articles operated upon, the next process is that of rinsing, which is effected by closing the cocks, *b*, *c*, *d*, *e*, *f*, *g*, and opening those at *i*, *k*, and *h*, when the steam from *C*, passes up the pipe *K*, into the vessel *L*, which is filled with clean hot water; the full pressure of the steam being now transferred to the surface of the hot water, forces it through the pipe *M*, and through the goods in the conical vessel *A*, carrying away the alkaline and other impurities through the pipe *N*, into the vessel *O*. The hot liquor in *O*, is now to be returned into *L*, by *i*, *k*, *h*, and opening those at *l* and *m*, when the steam passes down the pipe *P*, and forces the liquor contained in *O*, up the pipe *Q* *Q*, again into *L*, for the renewal of the operation, this part of the process being also repeated as often as may be deemed desirable, which will depend upon the condition of the goods.

The washing and rinsing having been performed, drying forms the next part of the process, which is effected by closing all the cocks except those at *a* *d* *e*, and allowing steam at a reduced pressure to pass direct from *c* into the vessel *A* again, by which all the water is driven out from the goods, leaving them in nearly a dry state, the steam passing off through the pipe *F*, and escaping at *R*. In this part of the process it is necessary to observe that steam should not be employed at a greater pressure than 20 lbs. to the inch, and that its action should not be prolonged beyond the time required for driving off the water.

For the bleaching of piece goods, in lieu of the circular-sided vessel *A*, the patentee recommends one with straight sides, with its area diminishing downwards: in this vessel the goods, having been

carefully folded, are to be packed closely together, and, in addition to the steaming and washing by means of alkaline solutions, currents of cold air, produced by a blowing machine, are to be admitted through the pipe S, which it is said greatly assists in whitening the fabric. [Register of Arts.

Description of the Diving Apparatus, patented by W. H. JAMES, Esq.

A VERY ingenious attempt has been made by Mr. W. H. James, to construct a diving apparatus that will enable the wearer to descend to the bottom of deep water, and remain there for half an hour, or more, to execute a variety of important operations, altogether impracticable without it: such as the recovery of sunken property; the obtaining of coral and pearls; building under water, &c. For some of these purposes the diving bell has of late years been employed, but as the workmen who descend can only carry on their work within its narrow limits, their operations are very much restricted. To overcome this inconvenience and give a more extended range to the actions of the diver, so as to render them more effective and useful, has been the object of Mr. James, in his invention, which has recently become the subject of patent right.

The diver is attired with a portable vessel, (placed around and adapted to the figure of his body,) which is filled with condensed atmospheric air, and by means of a simple arrangement of pipes and judiciously constructed valves, he is enabled to supply himself with fresh air for respiration during the time he is under the water.

It must be obvious that an apparatus on these principles will admit of considerable variations in the construction, which have therefore been contemplated by the patentee in his specification; we restrict the description to one of the forms, and its mode of operation.

The accompanying engraving gives a front view of the diver, fully equipped with the apparatus, and represents him as engaged in recovering from a wreck, at the bottom of the sea.

A is the vessel to contain the condensed air, which is to be filled by means of a condensing air pump; it consists of a series of strong metallic tubes, or one continuous tube, coiled elliptically round the body, and connected together by bands, to which straps are attached to secure it in its position. At *a* is a valve opening inwardly, through which the air is to be forced by a condensing pump, until it has acquired the desired degree of density; or the vessel may be filled, by attaching to the valve *a*, a reservoir already filled with condensed air, and allowing it to flow through the same until the pressure becomes equalised. The degree of density required will of course be determined by the time it is proposed for the diver to remain under water. (With a vessel of the magnitude exhibited, thirty atmospheres are considered sufficient for an hour's consumption.) B is a tube made of caoutchouc (or Indian-rubber) for conveying the air into the water-tight helmet C, by means of a valve so contrived as to be under the complete and easy control of the diver. The helmet