NEW INVENTIONS.

Safety Steam Boiler.

Measures to secure a patent for improvements in the above have been taken by Stephen Waterman, of Williamsburgh, N. Y., the original invention having been patented on the 28th of Dec., 1852. It is an improvement on the plan for preventing the serious casualties consequent to boiler explosions, which was noticed on page 108 of the present volume. It will be recollected that a "safety chamber" was placed upon the boiler, and that when the steam attained an undue pressure it tore a plate which separated the chamber from the boiler, and as the steam gained additional space, its pressure on the square inch was reduced. This plan, although completely effective, involved the necessity of a large safety chamber, it is to reduce the dimensions of this appliance, that the present patent is chiefly designed. A reservoir of cold water is placed in juxtaposition to the boiler and its appurtenances, so that the top communicates with the boiler and the bottom with the "safety chamber," both communications being opened and closed by cocks. By this contrivance, when the plate bursts, its disruption acts upon an arrangement which opens both communications, and the steam pressure on both sides of the water being equalized, this latter fluid, by its gravity, will descend into the chamber and condense the steam, or if considered preferable, it might pass directly into the boiler.

Improved Cotton Press.

A press of an improved description, for cotton, hay, and other articles, has been invented by Levi Dederick, of Albany, New York, who has taken measures to secure a patent. In this machine two followers are employed, one at each end of the box, which are operated by double levers, likewise fixed at either end, and worked by means of cords and pulleys. The article to be pressed is placed in the box, and the ends being drawn outwards, the outer ends of the levers are of course depressed, and the followers forced inwards, the article being pressed at the centre of the box. The levers and followers are restored to their original position by turning a winch at each end of the press furnished with cords and rollers.

Another Press.

This is a press for similar purposes, by the same inventor, who has taken measures to secure a patent for it. The improvements, however, are of a different nature from the last exhibited. and are not intended to alter existing mechanical arrangements, but merely make a change in the shape of the box, and the method of securing certain doors with which the inventor proposes to furnish it. The shape of the box is rectangular, rather greater in height than width, and it is provided with end doors and a side door. If two followers are used there is a door at each end, but if only one, then one end alone is provided with a door. The arrangement of the side door is likewise suited to the circumstance of one or two followers being used. In the latter case it is placed at the centre, and in the former, at the end, this is done to suit the convenience of taking out the bale, which will be pressed at the centre of the box or down at the bottom, according as one or two followers are employed. The other improvement in this invention consists in the fastening for the doors, which, particularly in the instance of the side door, is made with very great stability, a precaution that it will be evidently seen is very necessary when great pressure is employed. The end doors are in like manner secured in an efficient manner by means of a bar which can be easily turned, when the doors are required to be raised or opened.

Improved Trip Hammer.

Measures to secure a patent for improvements in the above have been taken by William Van Anden, of Poughkeepsie. N. Y. In this invention there are two distinct improvements. The first enables the workman to regulate the force with which the hammer descends upon the anvil, and the second is a superior manner of placing the friction rollers which receive the action of the cams. The hammer shaft is attached to a collar which works loosely around a shaft provided with a spring, whose duty is to force down the hammer, which it does with more or less energy according to its adjustment. When the cam shaft is made to rotate, the hammer shaft is elevated by the action of the cams against the friction rollers, which are placed in a frame capable of vibration, so as to relieve the cams after their highest points have performed their functions. A third cam, acting through the medium of a lever and set-screw, causes a spring to bear against the hammer shaft when the downward motion is to take place.

Soap Cutting Machine.

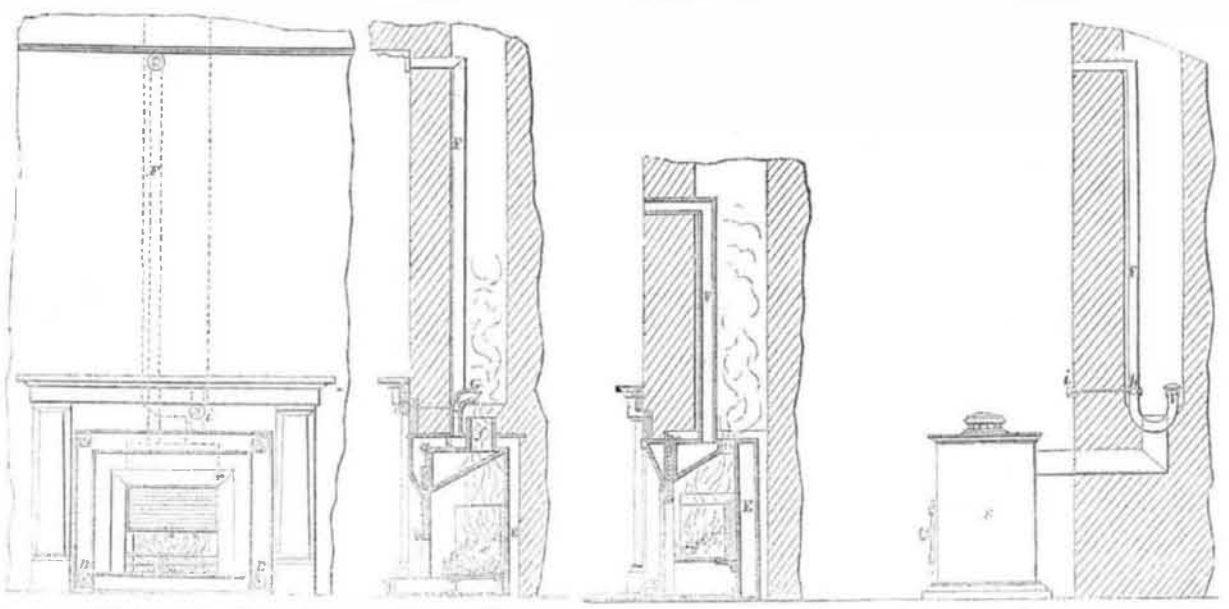
Measures to secure a patent for improvements in the above have been taken by James B. Duff of New York City. This machine is intended to cut soap into bars and cakes, and contains several improvements over the apparatus hitherto used. The vertical knives which are of wire, are not kept taut whilst cutting, but are capable of yielding, so that they form a loop, whilst passing through the soap, which will have a smooth and straight appearance when cut in this manner. The material is fed up to the cutters by a bed which is made to traverse by means of a rack and pinion, two horizontal wire cutters serving to smooth the top and bottom of the soap. The bars are cut into cakes by a similar plan, except that the wire cutters in this case being short do not require to yield. A self-adjusting spring lever regulates the delivery of the cakes when cut.

Improved Metal Tubes.

Measures to secure a patent for the above have been taken by Ernest Marx, of New York City. This invention consists in making tubes by rolling up sheets of iron or other ductile metal in successive convolutions until the required diameter and thickness are formed, and the securing it in such form by any suitable means. Tubing thus made may be used for machine-shafting or connecting rods, for masts of vessels, and for almost all purposes where tubes or bar-iron are employed. The advantage proposed is its capability of offering great resistance to tension, torsion, or flexure, being stronger in proportion to its weight than bar or tubes made in any other way, for the reason that any flaw or defect in the metal cannot extend far.

HEATING AND VENTILATING BUILDINGS.

Figure 1. Figure 2. Figure 3. Figure 4.



The annexed engravings are views of improvements in warming and ventilating buildings, taken from "Newton's Repertory of Arts Inventions," &c., London. It is a subject which is frequently urged upon our notice by correspondents, and we endeavor to embrace every opportunity to present something that may be of general interest.

Figure 1 is a front view of an open fire-place with the arrangements for ventilating. Figure 2 is a vertical section thereof. Figure 3 is a vertical section of a plan of carrying out the improved mode of ventilation, and figure 4 is a view of the system applied to a chimney in a dwelling where a stove is used.

In figures 1 and 2 the fire-place consists of a box made of sheet-iron, lined with fire-brick; the lower end of the fire-brick is inclined outwards for the purpose of reducing the capacity of the fire-place without diminishing the radiating surface. The grate is placed in the usual recess under the chimney the lower end of which is closed—as in figure 2—leaving only an opening for the metal flue, *f*, of the fire-box. The space, E, round the grate, is closed in front by a plate, so as to form a close chamber into which air may be admitted from the lower part of the room, at the openings, B B, figure 1, such openings being furnished with slide valves, to be opened and closed at pleasure. From the upper part of the space, E, there rises a pipe, F, the upper end of which communicates with the upper part of the room near the ceiling, as shown in figures 1 and 2. It will therefore be understood that cold air may be admitted to the space, E, through the holes or openings at B, and after being warmed in the space, E, it will pass up the pipe, F, into the room. A continuous current is thereby produced, so that the air admitted to the space, E, is not burned, but merely warmed before it issues into the room. If by this arrangement the atmosphere of the room is rendered too warm, it will only be necessary to close the openings, B B, by means of the slides, and then there will be no current of air through the pipe, F. The same arrangement may also be employed for ventilating the room, for which purpose it will only be necessary to cause the vitiated air in the upper part of the room to pass down the pipe, F, into the space, E, when it will be conducted into the chimney by the short pipe, G. This pipe has its mouth bent to keep the soot from falling into it; but a better plan is to have it straight with a cap over it. This short pipe is furnished with a throttle-valve, *h*, which is worked by a button, *i*, and when the room requires ventilation, it will only be necessary to open the valve, *h*, and close the valves, B B; the heated air of the room will then pass down pipe, F, into the case, E, which is filled with hot air, and the vitiated air from the room will then pass up the chimney through the pipe, G. When the room requires warming, the throttle valve, *h*, must be closed and the slide valves, B B, opened when the cold air will be warmed by contact with the heated sides of the case, E, and it will then ascend by the pipe into the room.

In figure 3 the lower aperture of the chimney is not closed as in figures 1 and 2, and the construction of the fire-place is such that it may be applied to any chimney without the necessity of closing the bottom part. In figure 3 the fire-place is enclosed in an outer casing so as to form a space, E, between the outer and inner casings, into which space air is admitted either at the bottom or from the upper part of a room. The tube, F, which conducts the vitiated air from the room terminates at the bottom in this chamber.—When it is required to warm the air of the room by passing a portion of it through the space, E, air is admitted through a branch side pipe into said space. The branch pipe which admits the air into, E, below, has a valve in it to regulate the quantity of air to be admitted, and to open and close the communication. The room can be ventilated by closing the valve which admits the cold air below by the pipe into chamber, E, at the back of the fire, when the hot air from the upper part of the room, will pass down pipe, F, go into chamber, E, and pass away by an opening at the back up into the chimney.—This mode of heating and ventilating rooms is upon the syphon principle; one which is old and well known, but which may, as shown, be applied in many ways.

In figure 4 the stove, S, is of any of the known forms—it looks much better in its plain unpretending style than the florid ornamental stoves in common use. The pipe is inserted in the chimney which is closed at the bottom to exclude any air except that which passes through the stove. The syphon pipe is shown at F. It is furnished with a valve, *h*, and button, *i*, for opening or closing communication with the room. The heat of the chimney is sufficient to rarefy the air in pipe, F, and thereby cause a draught from the room, which will by this means be ventilated. The stove is a close one the door opens in front of the circular grate, and it is made of wire gauze which acts as a blower.—The ventilation is shown as applied to the stove; the heating of the air by the grate plan being accomplished by the stove itself, which is placed in the room, and which, on this account, as is well known, heats a room with far less coal than a grate in the chimney. The fire-place with a grate, however, is the most cheerful plan, and is the one in general use in this city in sitting rooms, parlors, &c.

The greatest part of the heat generated in a grate goes up the chimney, and is lost so far as any benefit is derived from it by persons in the room. Dr. Arnot, by exposing ice in a chimney made the discovery, that more of it was melted in a given time there than in the room; this led him to invent the stove which still bears his name. Great attention should be paid to the best methods of economizing fuel, and proper ventilation. We have often directed attention to these questions by illustrating Ruttan's system, and in the notice which we presented two years ago, of Dr. Griscom's work on the subject. We have only to add at present that if all stove doors were made to open in front of the grate, and had a slit in the lower part to admit air by a wire gauze screen under the grate to supply the oxygen requisite for combustion, a great improvement would be effected. The coals could be fed in at the top, and the door used only for cleaning out the contents of the stove with a shovel. The door should be small and made with ribs fastened to it inside. The common ash pan cannot be dispensed with.

A proposition has been brought before Congress to purchase 100 fire annihilators for the use of the navy. The price will amount to $2,500 for the large size.

Beet root sugar is now made successfully in Ireland.