

way through the piles of stone in the course of time. A mixture of sand and water placed about the saw blades assists them in the operation of cutting. The gangs of saws are operated by machinery.

In winter the quarrymen clear the quarry of all refuse material such as broken stone and quantities of sand. In the work of removing the small bits of stone and sand a locomotive hauling a train of flat cars will be found at many of the quarries.

With reference to the sandstone quarries of the next State in rank to Ohio, Pennsylvania's yield has been increased largely in the line of building stone. The value of this stone alone last year showed an increase over the preceding year of \$1,131,988. The bluestone localities also showed an increase in value of \$44,903. Notable also in connection with Pennsylvania's stone quarries has been the progress made toward the consolidation of many of the sandstone and limestone interests. Both railroads and quarrymen are interested in this move.

In New York the principal sandstone region is in Orleans County. The belt is said to be a narrow one and not much more than 25 miles in length. The stone from this section is largely used for building purposes. From these quarries also come large quantities of stone for paving. Another important stone belt is near Potsdam, St. Lawrence County. Although the production of the State for last year as a whole showed a decrease, plans are on foot in some sections for enlarging the handling facilities. Comparatively recent has been the consolidation under one head of interests which in the past have been owned by many, and this, too, will result in quarrying upon a larger scale.

#### A NEW OIL BURNER.

An improved oil burner has recently been invented which is especially designed for use in the firebox of the ordinary domestic cooking stove or range. An essential feature of the invention is the design which permits the burner to be readily fitted into the stove without necessitating any material changes in the construction of the latter. The accompanying engraving illustrates the burner as placed in a range. It will be observed that the furnace consists of a body or log tapered at one end and provided with a longitudinally-extending flue into which the fuel is fed. This flue connects with a number of transversely-disposed fire or burner openings. Fuel is fed by gravity into the log through a pipe connecting with an oil tank. The pipe leads to the rear end of the log, where it enters the generator, which consists of a malleable iron pipe placed vertically before the tapered portion of the log. Here the oil is vaporized and passes over the top of the log to a needle valve through which it is fed into the burner. The generator is so placed as to become thoroughly heated without coming into direct contact with the flames. In order to take up any overflow of oil that may occur when first lighting the burner, a drip-pan lined with asbestos is provided under the needle valve and also under the body proper, as shown in Fig. 1. As soon as the log has been sufficiently heated, this surplus oil is vaporized and passes up into the burner, as indicated by the arrows. In this way the disagreeable odor which forms an objectionable feature of so many oil burners is avoided. At the same time the openings in the bottom of the log serve to increase the draft. In order to further consume all the carbon and make the burner absolutely odorless a water pipe is provided for feeding water in drops into the jet at the needle valve. The water is immediately vaporized on coming into contact with the hot jet, and passing into the burner assists in the combustion. The combustion of the gas, it is claimed, is so complete that whatever deposit has been formed by the oil when first lit, is, in a short time, consumed, and the firebricks soon look as clean as a new sheet of manila paper. The water feed also reduces the noise of the burning gas considerably. The flames fill the firebox and shoot over the oven, heating the same very rapidly and keeping it at a uniform temperature. Water in the boiler is made hot in a remarkably short time. Any good fuel can be used which will be consumed at the rate of one and a half to two gallons per day. The burner is also adapted for use in a furnace, a single burner being sufficient to heat a medium-sized dwelling. The inventor of this device is Mr. Oscar Falkenwalde, of Baltimore, Md.

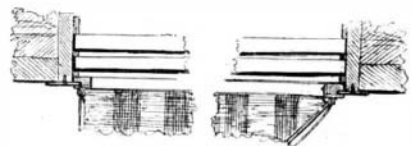
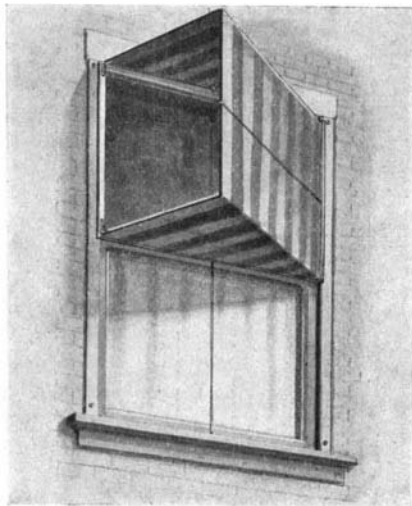
#### The Current Supplement.

"Some New Arrivals at the London Zoo" is the title of the article which opens the current SUPPLEMENT, No. 1415. This article is not the only one on natural history, for Albert Hart discusses sponges, where they live and how they are obtained, and tells something of their uses. R. Lydekker has something to say on some peculiar products. Foucault's pendulum experiments can be repeated by means of a small-scale apparatus which is fully illustrated and described. Dr. T. Byard Collins gives a critical account

of the airship of M. Frederick l'Hoste. Miscellaneous articles, short, but bright and entertaining, are also included in the columns of the current SUPPLEMENT. Physicians will appreciate an article on the ambulance work in country districts of Germany. The Fire Walk Ceremony of Tahiti is one of the curious rites performed by savage nations which has attracted no little attention among ethnologists. Prof. S. P. Langley during a visit to the Fiji Islands observed the ceremony carefully and presents, in a very exhaustive article, a scientific explanation of the phenomena. Prof. Warren Upham, well known to paleontologists, writes on primitive man and his stone implements. Fred T. Jane continues his naval war game articles. The recent Berliner telephone transmitter patent decision is digested.

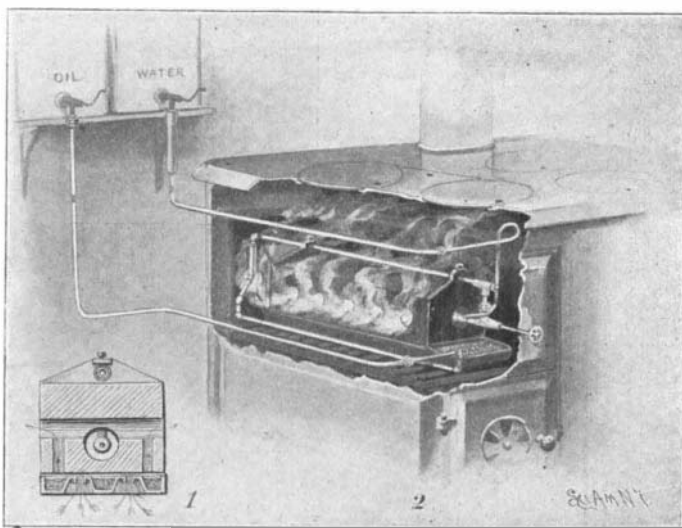
#### VENTILATOR.

An excellent ventilator for use in summer weather is illustrated in the accompanying drawings. This ventilator may be attached to a window casing to direct



COMBINATION AWNING AND VENTILATOR.

or force air into a room through the open window. The device comprises a hood of canvas or awning material, or it may be formed of metal or wooden slats designed to fold one on the other, similar to Venetian blinds. The front, or open end of the hood, is attached to a metal bow which has swinging connection with one side of a frame, the other edges being secured to rails on this frame. The ends of the bow are connected to spiral springs which serve to hold the hood in its open position. By drawing the cord fastened to the center of the bow the hood can be folded back so as not to obstruct the light from the window. The frame to which the hood is secured is mounted to slide in vertical guide-ways in the window casing. It may be drawn up to



IMPROVED OIL BURNER PLACED IN A RANGE.

any desired position by operating the cord attached to the frame and passing over a pulley at the top of the window casing. It is designed that the opening of the ventilator shall be placed in a general direction of the wind. If it be desired to change the direction of the ventilator, this can be easily done by taking out a fastening screw of one of the guide plates of the window casing. The ventilator frame can then be removed and reversed. In warm weather this device affords an efficient ventilator, shutting out the heat of the sun, and at the same time causing a greater circulation of air in the room than would result were the open window not provided with this device. The inventor of this device is Mr. Robert E. M. Bain, Century Building, St. Louis, Mo.

#### Subsidizing of British Mercantile Vessels for Naval Purposes.

BY THE LONDON CORRESPONDENT OF THE SCIENTIFIC AMERICAN.

The report of the committee organized by the British government upon the question of armed mercantile cruisers has been published. The committee were specially appointed to investigate generally the problem of the utilization of mercantile vessels as auxiliary cruisers in time of war; what boats might be secured for this purpose from the present mercantile fleet of Great Britain sufficiently strong from a structural point of view to carry an armament of 4.7-inch guns at least; and what vessels should be prevented by subsidy from passing under a foreign flag. In this report the committee has embodied several recommendations, by which means the foregoing requirements might be fulfilled. The results of the investigations of the committee proved that the majority of the large vessels of the British mercantile marine of high speed are structurally strong enough to carry and fight 4.7-inch guns; are subdivided to the present requirements of the Admiralty; and can be fitted with the official steering gear below the water line without difficulty, and at an expense of from £2,500 to £5,000 per annum, including interest on excess of first cost, depreciation, maintenance, etc. In connection with the initial cost of vessels of 25 knots, which is the present desired speed of these vessels, and also the extent of the annual subsidy requisite to compensate private shipping companies running such vessels in times of peace, three recommendations have been advanced by the committee. The first suggestion is that the Naval Department should guarantee the representative cost of the vessel, to enable the shipping owner to raise the capital at the nominal rate of interest of 3 per cent instead of the general 5 per cent; or secondly the Admiralty should contribute a lump sum toward the first cost of the vessel, thereby reducing the shipping owner's outlay; or thirdly, the Admiralty should make an annual payment extending over a number of years.

The committee has based its calculations upon the present cost of running large mercantile vessels, but has not overlooked the fact that in the future the expense of running will possibly be greatly reduced by the employment of oil fuel, steam turbines, etc. With regard to the subsidy, they suggest that it would be necessary to guarantee the bounty for a considerable period, such as ten years. To provide against the possibility of any such subsidized vessels being transferred under another flag, without the consent of the Admiralty, as was recently done in connection with the White Star Line, the committee advance a suggestion by which means such action might be controverted and their interests in a vessel secured. During the term of the subsidy the Admiralty should be registered owners of 33-64ths of the vessel at least, the profits being left wholly to the company, and legal security being taken to show that all owners' obligations should appertain exclusively to the company. The committee estimate that the cost of building liners to fulfill the purposes of armed cruisers of 25 knots speed and 52,000 I. H. P., such as the Cunard Company have in hand, would be approximately \$5,000,000 per vessel. In connection with the tenders for the two new 25-knot vessels the Cunard Company are building for the Admiralty, in accordance with the terms of the subsidy agreement issued a few weeks ago, the Naval Department have imposed very severe and unusual conditions upon the builders. The contracted speed is to be 25 knots, and if at the end of twelve months' service the boats have not averaged this speed throughout their voyages during the year, they may be returned to the builders. To be more explicit, this stipulation practically means that the boats have to undergo one year's speed trial. The majority of the shipbuilders in the country consider this an impossible condition, since after the vessel has passed out of their hands it might fail to maintain the requisite speed from causes over which they had no control. Also in view of the enormous risk a shipbuilder will incur in the construction of the vessels, which may possibly be thrown back upon his hands after a year's service, many of the builders have refrained from tendering for the construction of the ships. The government are advancing the necessary capital to build these two boats at three per cent interest, on the security of the entire Cunard fleet, including these two new vessels, and the Naval Department are paying the company \$750,000 per annum for the use, when necessary, of the entire Cunard fleet.

A photographic copy of the fourth patent issued by the United States was recently secured by the authorities at Washington, who have been recently engaged in a search to recover some of the oldest papers. The whereabouts of the original of this one is not known. It was granted on January 29, 1781, and was issued to Francis Bailey, of Philadelphia, and covered a process for "performing punches." The document bears the signatures of George Washington, Thomas Jefferson, and Edward Randolph.