

ABSORPTION OF HEAT BY VAPORS AND ODORS.

From Prof. Tyndall's lecture on Radiation, published by D. Appleton & Co., we take the account of his investigations of the absorption of heat by vapors and odors:—

"We commenced the demonstrations brought forward in this lecture by experiments on permanent gases, and we have now to turn our attention to the vapors of volatile liquids. Here, as in the case of the gases, vast differences have been proved to exist between various kinds of molecules, as regards their power of intercepting the calorific waves. While some vapors allow the waves a comparatively free passage, in other cases the minutest bubble of vapor, introduced into the tube already employed for gases, causes a deflection of the magnetic needle. Assuming the absorption effected by air at a pressure of one atmosphere to be unity, the following are the absorptions effected by a series of vapors at a pressure of $\frac{1}{100}$ th of an atmosphere:—

| Name of Vapor. | Absorption. | Name of Vapor. | Absorption. |
|-------------------------|-------------|----------------------|-------------|
| Bisulphide of Carbon... | 47 | Sulphuric Ether..... | 440 |
| Iodide of Methyl..... | 115 | Formic Ether..... | 548 |
| Benzol..... | 136 | Acetic Ether..... | 612 |
| Amylene..... | 321 | | |

"Bisulphide of carbon is the most transparent vapor in the list, and acetic ether the most opaque; $\frac{1}{100}$ th of an atmosphere of the former, however, produces 47 times the effect of a whole atmosphere of air, while $\frac{1}{100}$ th of an atmosphere of the latter produces 612 times the effect of a whole atmosphere of air. Reducing dry air to the pressure of the acetic ether here employed, and comparing them then together, the quantity of wave-motion intercepted by the latter would be many thousand times that intercepted by the air.

"Any one of these vapors discharged in the free atmosphere, in front of a body emitting obscure rays, intercepts more or less of the radiation. A similar effect is produced by perfumes diffused in the air, though their attenuation is known to be almost infinite. Carrying, for example, a current of dry air over bibulous paper moistened by patchouli, the scent taken up by the current absorbs 30 times the quantity of heat intercepted by the air which carries it; and yet patchouli acts more feebly on radiant heat than any other perfume yet examined. Here follow the results obtained with various essential oils, the odor, in each case, being carried by a current of dry air into the tube already employed for gases and vapors:—

| Name of Perfume. | Absorption. | Name of Perfume. | Absorption. |
|--------------------|-------------|-----------------------|-------------|
| Patchouli..... | 30 | Portugal..... | 67 |
| Sandal Wood..... | 32 | Thyme..... | 68 |
| Geranium..... | 33 | Rosemary..... | 74 |
| Oil of Cloves..... | 34 | Oil of Laurel..... | 80 |
| Oil of Roses..... | 37 | Camomile Flowers..... | 87 |
| Bergamot..... | 44 | Cassia..... | 109 |
| Neroli..... | 47 | Spikenard..... | 355 |
| Lavender..... | 60 | Aniseed..... | 372 |
| Lemon..... | 65 | | |

"Thus the absorption by a tube full of dry air being 1, that of the odor of patchouli diffused in it is 30, that of lavender 60, that of rosemary 74, while that of aniseed amounts to 372. It would be idle to speculate on the quantities of matter concerned in these actions."

THE GREAT LAKES TO BE CONNECTED WITH THE MISSISSIPPI.

At the last meeting of the Polytechnic Association, Mr. Carter, of Chicago, gave some particulars in relation to the work of lowering the bed of the Illinois and Michigan canal, for the purpose of draining the Chicago river into the Illinois. This canal is 100 miles in length, with a width of 70 feet at the surface, and 30 at the bottom. It connects the Chicago river, at a point near the city, with the Illinois river at Peru. It passes over a summit of about seven feet elevation, the water being raised for this level by a steam engine. The first design of the engineers was to sink the canal deep enough to avoid this summit level; but, to save expense in construction, the Commissioners finally decided on the present plan. The citizens of Chicago have, for some time, been desirous to have the canal sunk through this level, in order to drain the waters of the Chicago river through the canal into the Illinois, instead of allowing them to flow, as at present, into the lake, where they foul the water of the harbor by the sewerage of the city. It has finally been decided to do this work at the expense of the city, and on

the close of navigation this year, numerous gangs of workmen are to commence the task so as to complete it with the least possible delay. Mr. Carter said that the length of the summit level is about 18 miles.

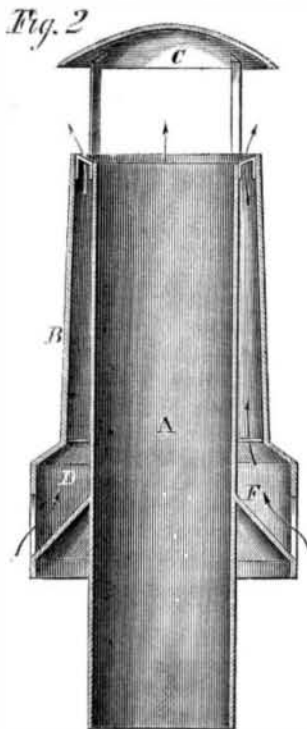
HENRIKSEN'S CHIMNEY TOP.

The inventor of this chimney cap asserts that it is a complete cure for smoky chimneys, and highly desirable where a great draught is needed. It is claimed that on sea-going or other steamers, the funnel may be made much shorter on this plan, and that for sail-



ing vessels it is also desirable, making the fire in the galley burn freely in baffling winds when other arrangements fail. It has been used in some of the hotels and factories in San Francisco, and found to be advantageous.

In construction it is simply a pipe, A, with a jack-



et, B, and a hood, C, as shown in Figs. 1 and 2. The lower part of the jacket is enlarged, as at D, and has openings, E, through which the air enters. It issues at the top, as shown. The jacket is supported by braces, F, at top and bottom. The air circulating through this appurtenance creates a current within the main pipe, A, which causes the fire to burn briskly. It would seem to be a useful invention.

It was patented on Oct. 15, 1865, through the Scientific American Patent Agency, by B.A. Henriksen, of San Francisco, Cal., whom address for further information. [See advertisement on another page.]

FOR INVENTORS AND MECHANICS.

We desire again to call the attention of our readers to the new work, as above, lately published by Messrs. Munn & Co., SCIENTIFIC AMERICAN Office, New York City. Every person who is interested in the mechanic arts or inventions should have a copy. It contains a great deal of valuable information, crystallized, so to speak, into the smallest compass; and this reduction of space, by saving paper, permits the issue of the book at the insignificant price of 25 cents. Among other things, it contains 112 diagrams illustrative of the best mechanical movements—reduced by the photograph and engraved expressly for the work. Mechanics and inventors will find these engravings to be of value as references, whenever they are searching for good methods of obtaining any required motion of parts. It likewise contains all the Patent Laws of the United States, conveniently arranged with appropriate headings, for reference; also the official rules and directions for doing business at the Patent Office; forms for assignments of patents; useful advice upon the sale and introduction of patents; diagram of the condensing steam engine, with letters of reference to all of the parts; a chapter upon practical geometry, with diagrams; several illustrations of gasket braiding, with directions of value to engineers; table of the pressure and temperature of steam; table of the effects of heat upon the various metals and other bodies; how to make tracing paper; table of the electrical conducting power of metals; how to calculate the horse-power of a stream of water, a water wheel, or a steam engine—together with instructions how to obtain patents in the United States and other countries, with schedule of fees, etc., and much other interesting matter, which we have not space here to mention. Sent by mail every where. Address Munn & Co., No. 37 Park Row, New York.

LATEST FOREIGN INTELLIGENCE.

WHAT PROPER INSPECTION DOES FOR STEAM BOILERS.—A few months ago we laid before our readers a summary of the report of the engineer of the Midland Steam Boiler Insurance and Inspection Company, and we now extract the following from the report of the chief engineer to the Manchester Association for the Prevention of Boiler Explosions. In one month, he says, 373 boilers have been examined, and 98 dangerous defects met with. Three explosions had taken place in as many weeks in his district, through which one life had been lost, and four persons injured. Not one of these boilers, however, was under the inspection of the company, and competent inspection would certainly have prevented the explosions.—*The Ironmonger.*

In experimenting upon the wood fuel, Count Rumford found that lime-tree wood gave out most heat in burning.

HIGHWAY STEAM LOCOMOTIVES.—"An Engineer" writes the appended letter to an English cotemporary:—Feeling that your paper would be the proper channel through which all mechanical inventions of use and utility should become known, I have thought that the following description of a trial trip, made by Richards and James's patent highway locomotive engine, manufactured at the Victoria Ironworks, West Croydon, would be interesting to your many readers. This engine is nominal 32-horse power, having two 12-inch cylinders, 12-inch stroke, fixed upon the bed-plate or frame, upon which also rests the boiler. The boiler-working pressure is 100 lbs. per square inch, proved 250 lbs., the steering apparatus is attached to the front wheels, and the driver is the engineer and steersman, being able, by the arrangement adopted, to handle his engine from his position as the steering-wheel, one stoker and driver being only necessary to man the engine. The driving gear is divided into three speeds, changed at will of the steersman, viz., two, five, and eight miles per hour. The machinery is entirely hidden from view by a very neat framing. The distance from the ground to ash-pan is 2 feet 2 inches. She carries a tender, with donkey pump attached, for pumping water from the sides of the roads, steam being taken through a flexible tube from a large engine boiler; this pumps throws 10,000 gallons of water per hour, filling the tender, capacitated to carry 1,000 gallons