## INDOOR BED TENTS.

BY KATHERINE LOUISE SMITH.

Fresh air at night and plenty of it is the cry that is going up among those who are determined to subdue the "Great White Plague," and with these persons it has become more than a fad, a necessity. Those who have resolved to abstain from kissing even their nearest and best, are now either seeking some practical method of sleeping out of doors, or planning some device whereby a good supply of fresh air may be obtained in warm bedrooms. Many persons are building screened porch bedrooms just outside of the sleeping rooms, where they can sleep in the patent sleeping bags that leave only the head exposed and that come with pockets for holding the hands. These persons dress and undress indoors, and jump into their twenty-dollar sleeping bag after adjusting a warm hood and muffler. But though the muffler can be drawn over the head so that only the eyes are exposed, and though it is made of heavy wool and elastic, there is in this outdoor sleeping bag danger of catching cold between the warm room and the outside bed.

So these fresh-air enthusiasts are casting about for some method that shall keep the body warm, the head exposed to the fresh air, and the bed adjusted in such a way that undressing and passing to the bed can be conducted in a warm room. To fill this need several devices have been invented, but they all fall under two heads—one where the person sleeps with his head out of the window, and the other where the bed is rolled to the open window, and a tent employed to drop over the sleeper's bed.

The cost of the ordinary window bed is moderate. It can easily be made by any carpenter, as it is constructed of an ordinary hospital bed with the legs adjusted eighteen inches from the end. These are just long enough to raise the bed so it can go over the sill. The head of the bed at night is thrust through the window, the sleeper creeps into the bed with his head outside the window and draws an awning down over his head, which protects him from inclement weather and at the same time does not exclude the air. A wide strip of felt is fastened to the lower sash of the window, to keep the air out of the room. In this way the sleeper has his head outdoors and his body under the bed clothes in a warm, heated room. There are, however, two objections to this bed, though it is so simple it can be made at home. These are that in cases where it protrudes through a window above the first floor, there is often the uncomfortable sensation that one may fall, and the other is that the bed shows from the outside of the dwelling.

For these reasons many persons are using the new fresh-air tents which are fastened inside the window. While several varieties are made, they all involve similar principles of construction, and they have the merit of not being conspicuous. In using the window tent, the side of the bed near the top is placed next to the open window. The tent, which is made of heavy canvas or awning cloth, comes down from the inside of the window over the side of the bed and over the pillow. It reaches to the middle sash, and can be adjusted by tightening a screw, and is capable of being moved from one window to another. With the head once under the tent, one can actually breathe the fresh air from the window, while the rest of the body is in the bed covered by the bed clothes and in a warm room.

These tents have become popular, for they are large enough so that the face can be close to the window or on the pillow and three feet back. A little celluloid window in the side of the tent next to the room allows the user to look out and to converse with those

(*Continued on page 423.*)

## AN EMERGENCY OXYGEN CUP FOR MINERS.

BY FREDERIC B. HYDE.

Clarence Hall, explosives expert for the government, has just announced the invention of a safety device which, had it been in use a few weeks ago, might have saved hundreds of lives at the mine of the St. Paul Coal Company at Cherry, Ill. The device is a simple appliance, which generates sufficient oxygen to sustain life for a half hour or so under any conditions of atmosphere. Had the miners who died in the recent disaster been supplied with this apparatus, the densest of smoke or an atmospheric condition entirely devoid of oxygen would not have killed them. They would have been enabled to remain alive until the supply of oxygen was exhausted.

MINER'S EMERGENCY OXYGEN OUTFIT.

The newly-invented oxygen generator guarantees life for a lease of from a half time ranging an hour to an hour while a man is fighting his way to the open air or awaiting the coming of rescuers. The invention was made by Mr. Hall while in the government service.

The manner in which the inventor hit upon the idea of supplying oxygen to the entombed miner was casual in the extreme. Mr. Hall was lighting the lamp of an automobile, when the thought occurred to him of generating oxygen as the gases of the lamp were generated, and supplying that oxygen to miners to breathe when the air of the mine had become so contaminated with poisonous gases and smoke as to spell immediate death. Accordingly he made a device which consists of a water chamber, and below it a compartment filled with sodium peroxide. In an emergency, a stopcock is touched, and the water comes in contact with the chemical. The oxygen is generated. This is passed through the water, which cools it. Then it passes to the mouth and nose by means of a mask, such as is fitted to the face when gas is ordinarily administered by a dentist. Thus may oxygen be supplied that will keep a man going for half an hour while he fights his way out of a mine filled with gas or smoke.

Mr. Hall as a representative of the government studied many of the great disasters in mines that have occurred in recent years. At Mononga, where more than three hundred men lost their lives in December, 1907, he found that the vast majority of the men had died by slow suffocation long after the explosion. Many of these had crawled for great distances on their hands and knees, for the miner knows that the best air is near the ground. Their trousers were worn through at the knees, and their blood marked their trails. Their fingers were worn through to the bone from crawling.

Of all men who die in mines, ninety per cent meet death through suffocation. There are in the United States 700,000 men who work in coal mines. Many of these are daily subjected to the danger of suffocation. Every year 4,000 of them go to their deaths in this way. The ordinary safety devices are expensive. The men cannot have them always at hand, even if they could afford the expense.

The new device can be slipped into the coat pocket, and kept with the coat and lunch basket, always within reach.

Mr. Hall is in charge of the explosives station in Pittsburg, recently described in the SCIENTIFIC AMERICAN SUPPLEMENT. That station, it will be remembered, has a large chamber in which all sorts of poisonous gases may be confined and into which men are sent to demonstrate various appliances. Various kinds of oxygen helmets which will keep a man going for two hours were tried out here.

In this demonstration chamber Mr. Hall burned excelsior in the chamber until the smoke was so thick that the eye could not see four inches through it. Then he donned his oxygen-producing device and went in. He remained here quite comfortably for fifteen minutes. Then the smoke pained his eyes and drove him out. The device continued to generate oxygen, and other men entered the chamber with entire safety for more than half an hour.

### A New Chromatic Circle.

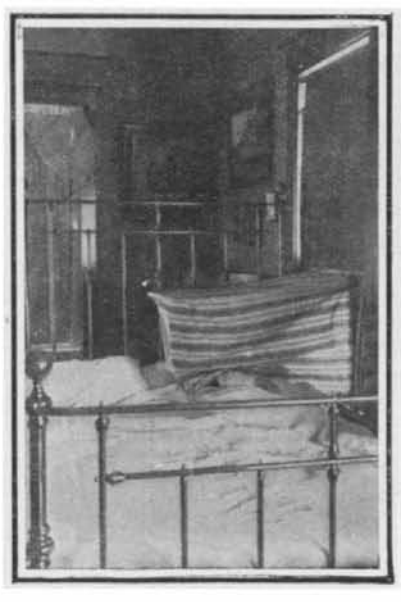
The principal purpose of a chromatic circle is to show the true complementary color corresponding to any given tint. Rosenstiehl has attempted to correct the old error of regarding red and green, yellow and violet, blue and orange, as pairs of complementary colors. These false notions were introduced by Robert Waring Darwin at the close of the eighteenth century. They have been perpetuated by the chromatic circle used in the Gobelins tapestry manufactory and popularized by a lithographic copy of that circle, made in 1861, which is the only document at the disposal of French artist-artisans.

Rosenstiehl's experiments show: First, that the true complementaries of red and orange are not green and blue, but two tints near together in the green-blue region; second, that the complementary of yellow is not violet, but blue; third, that violet is the true complementary of green. The differences between the true complementaries and the false complementaries of Darwin are sufficiently great to warrant the construction of a new chromatic circle. Rosenstiehl's circle comprises twenty-four colors, which form twelve exactly complementary pairs. A neutral gray is produced by the rotation of a disk, half of which is covered with each color of any pair of complementaries, and all the grays thus obtained are very nearly identical. This condition, very difficult to realize in practice, implies not only equal intensities of the two colors of a pair, but sensibly equal intensities of all the colors. The result is in accordance with the Young-Helmholtz theory of the three fundamental color sensations.

The first bituminous coal mined in the United States, states the United States Geological Survey, was taken from what is usually termed the Richmond Basin, a small area in the southeastern portion of Virginia, near the city of Richmond. This basin is situated on the eastern margin of the Piedmont Plateau, 13 miles above tide water, on James River. It lies in Goochland, Henrico, Powhatan, and Chesterfield counties. The coal beds are much distorted, and the coal is of rather low grade when compared with that from other districts with which it has to come into competition. The occurrence of coal was known in the Richmond Basin as early as 1700, and in 1789 shipments were made to some of the Northern States. In 1822 the production amounted to 48,215 gross tons. At present what little coal is produced in this field is for local consumption only.

Storm awning raised, showing the sleeper in the indoor bed tent.

The storm awning outside the window.



The window sleeping tent in use.

Sleeping hood to protect the head from cold.

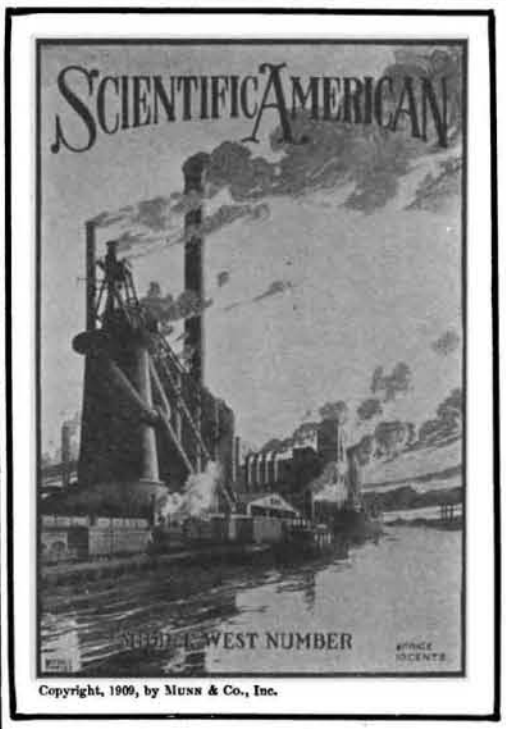
INDOOR BED TENTS.

| | |
|---|---|
| Starch, soluble, A. E. Militz | 941,159 |
| Steam or other fluid pressure regulator, W. H. O'Connor | 941,092 |
| Steam washer, automatic, R. E. Jack | 940,694 |
| Stocking, self-supporting, G. Graham | 941,193 |
| Stopper, O. A. Borden | 941,302 |
| Stove, Johnson & Noble | 941,321 |
| Stove and range top, cooking, B. B. Culver | 941,064 |
| Stove frame, gas, F. Graff, Jr. | 941,141 |
| Stovepipe, W. W. Graham | 940,927 |
| Street indicator and advertising device, combined, J. H. Goodier | 940,963 |
| Sweep stock, J. Stone | 940,905 |
| Swimming appliance, W. A. Glazier | 941,244 |
| Swing, E. V. Lewis | 941,081 |
| Talking machine sound box, J. C. English | 940,795 |
| Talking machine stand and horn, combined, H. C. Miller, reissue | 13,044 |
| Talking machines, apparatus for making sound records for, C. S. Wickes | 941,291 |
| Teaching penmanship, device for, S. R. Smith | 940,744 |
| Telephone attachment, C. B. Mitchell | 941,086 |
| Telephone cabinet, C. E. Oxford | 941,336 |
| Telephone key and means for actuating the same, W. Christensen | 940,673 |
| Telephone mouthpiece, antiseptic, G. Rowlands | 941,173 |
| Telephone system, D. S. Hulfish | 940,693 |
| Telephone system, H. B. Stone | 940,746 |
| Telephone system, J. N. Wallace | 940,994 |
| Telephonic ssytem for auditoriums, K. M. Turner | 941,114 |
| Thorium sulfid, making, J. L. Huber | 941,071 |
| Threshing machine concave, O. H. Paschke | 941,037 |
| Tie. See Cross tie. | |
| Tile-faced blocks, machine for molding, Meeker & Drake | 940,983 |
| Tin plate by means of chlorin, detinning, H. von Schutz | 940,898 |
| Tin plate finishing machine, E. Norton | 940,715 |
| Tire, A. T. Tizard | 941,289 |
| Tire, cushion, C. O. Baughman | 940,919 |
| Tire for vehicles, resilient, G. O. Draper | 941,015 |
| Tire protector, rubber, H. R. Palmer, reissue | 13,045 |
| Tire, spring, R. M. Spencer | 940,904 |
| Tire, wheel, F. L. Berg | 941,058 |
| Tobacco press, C. H. Hammond | 940,803 |
| Tongue support, W. C. D. Evans | 940,960 |
| Tool holder, W. J. Powell | 941,272 |
| Tool holder and means for setting the tools therein, M. Morton | 940,938 |
| Torpedo, J. Tasto | 941,111 |
| Toy, A. H. Cotton | 941,311 |
| Track structure, C. W. Kutz | 941,324 |
| Trap, O. Janke | 940,877 |
| Trap, W. W. Worcester | 940,911 |
| Traveling bag hinge, W. J. Petri | 941,040 |
| Treadle mechanism, W. Bartholomew | 940,659 |
| Trick chair, E. De Moulin | 941,135 |
| Trolley pole catcher, J. H. Walker | 941,216 |
| Trolley, self-restoring, H. H. Parker | 940,718 |
| Trousers crease retainer, H. A. Neumann | 940,712 |
| Truck, car, W. H. Son | 940,901 |
| Truck, car, C. W. Wodznski | 941,293 |
| Truck side frames, brake hanger pin construction for car, G. G. Floyd | 940,865 |
| Tubes, apparatus for making spirally wound, C. F. Jenkins | 941,255 |
| Tug attachment, shaft, Littman & Lackie | 941,326 |
| Turbine, elastic fluid, J. S. Green | 940,802 |
| Turbine, elastic fluid, P. J. Hedlund | 940,874 |
| Turbine, steam, M. Keller | 941,322 |
| Turbines, automatic stop for elastic fluid, F. Hodgkinson | 940,089 |
| Typewriter, keywheel, J. W. Miller, Sr. | 941,026 |
| Typewriting machine, H. R. White | 940,765 |
| Typewriting machine, O. Woodward | 941,120 |
| Typewriting machine, C. B. Yaw | 941,122 |
| Typewriting machine, J. C. McLaughlin | 941,166 |
| Typewriting machine adjusting appliance, C. S. Alverson | 941,294 |
| Undertaker's lifting strap, J. P. Huber | 941,072 |
| Union suit, J. E. Richards, reissue | 13,046 |
| Unloading device, shiftable instantaneous, J. Herks | 940,811 |
| Urinal, female, M. M. Van Vechten | 940,756 |
| Valve, J. C. Evans | 941,314 |
| Valve controlling device, E. T. Pardee | 941,033 |
| Valve, cut-off, J. L. Moore | 940,815 |
| Valve device for corrosive, liquids, W. H. Smith | 941,351 |
| Valve gear, Chubb & Mullen | 941,189 |
| Valve, rotary discharge, O. Mantius | 941,024 |
| Vaporizer, oil, J. F. Malcom | 940,981 |
| Vegetable cutter, J. Spenko | 940,830 |
| Vegetable cutter, J. Moreau | 941,161 |
| Vegetable masher, B. Iitsuka | 941,073 |
| Vehicle brake, automatic, C. E. Crumm | 941,063 |
| Vehicle canopy top, J. Reid | 941,274 |
| Vehicle, dumping, W. H. Phillips | 940,721 |
| Vehicle, motor, J. A. Charter | 941,129 |
| Vehicles, gear actuating mechanism for motor, G. H. Lanchester | 941,261 |
| Vehicles, pole attaching means for, J. G. Maloney | 940,982 |
| Velocipede, G. C. Worthington | 941,121 |
| Vending machine, W. H. Laraway | 941,079 |
| Ventilator, J. M. Rose | 941,171 |
| Vests, trousers, etc., means for adjusting, F. M. Schmidt | 941,277 |
| Veterinary instrument, E. G. Lawton | 941,325 |
| Violin key, H. Harmer | 941,196 |
| Wagon, camping, D. L. Hardin | 941,195 |
| Waist and skirt supporter, A. M. Preston | 941,207 |
| Wallet, J. R. Cardwell | 940,853 |
| Warp beam tension device, G. Keller | 941,201 |
| Washboard attachment, M. G. Sarno | 940,896 |
| Washer. See Steam washer. | |
| Washers, bearing for sterilizing, W. Bartholomew | 940,663 |
| Washing machine, Lewis & Graves | 940,882 |
| Washing machine, W. E. Devore | 941,344 |
| Washing machine attachment, S. Bowman | 941,304 |
| Washtub cover, A. Adams | 941,054 |
| Watches and clocks, individual hair spring stud index for, C. Teske | 940,750 |
| Water bag, F. A. Gordon | 941,245 |
| Water closet, etc., tank, G. H. Bailey, 940,951, | 940,952 |
| Water closet, ventilating, C. H. Thompson | 940,833 |
| Water fountain, B. Kaminsky | 940,879 |
| Water heater, D. Hanlon | 940,685 |
| Water heater, G. C. Madsen | 940,980 |
| Water heater, G. H. Wade | 941,215 |
| Water power applying apparatus, F. T. Newbery | 941,090 |
| Water wheel, D. D. Dennis | 940,677 |
| Web folding mechanism, E. Klein | 940,933 |
| Wedges, manufacturing compound tapered, C. E. Sweet | 940,949 |
| Weeder, F. M. Newland | 941,091 |
| Welding tool, W. A. Sparks | 940,903 |
| Well strainers, self-closing bottom for, J. A. Pollard | 941,205 |
| Well tubing and means for connecting sections thereof, G. A. Pittman | 941,204 |
| Wheel guard or fender, vehicle, J. O. Roberts | 941,170 |
| Wheels, mud scraper for, J. O. Davison | 940,859 |
| Winding, doubling, gassing, and like machine, yarn or thread, Higginson & Arundel | 941,319 |
| Winding indicator, J. C. Hawkins | 941,143 |
| Window, J. Cooney | 941,310 |
| Window construction, metal, G. H. Forsyth | 941,018 |
| Wire joints, tool for forming, A. B. Probasco | 940,823 |
| Wire stretcher, M. M. Marty | 940,884 |
| Work support, W. C. Stewart | 940,745 |
| Wrench, W. P. Lewis | 940,977 |
| Yeast compound, dry, J. E. Yost | 941,221 |

A printed copy of the specification and drawing of any patent in the foregoing list, or any patent in print issued since 1863, will be furnished from this office for 10 cents, provided the name and number of the patent desired and the date be given. Address Munn & Co., Inc., 361 Broadway, New York.

Canadian patents may now be obtained by the inventors for any of the inventions named in the foregoing list. For terms and further particulars address Munn & Co., Inc., 361 Broadway, New York.





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# The Middle West Number of the SCIENTIFIC AMERICAN

On December 11th, 1909, the Scientific American will issue a number devoted entirely to the wonderful Middle West region of the United States, a number which will set forth broadly and lucidly not only the agricultural interests of that region, but also those larger engineering undertakings which are destined to transform the Middle West, in part at least, into a manufacturing territory.

With that object in view the Middle West Number will publish articles on the following subjects:

**I. The Chicago and Gulf Waterway.**—An illustrated description of Chicago's drainage canal, an engineering work which stands without a parallel in the world.

**II. Chicago as a Railroad Center.**—Chicago is the greatest railroad center in the world.

**III. The Wonderful Grain Trade of Chicago.**—Chicago is an enormous wheat bin, into which much of the grain raised in the middle West is poured.

**IV. Shipping on the Great Lakes.**—Most of the iron ore that is now smelted in Pennsylvania is mined in the middle West. To transport it to the blast furnaces of the East at a cost which will enable American steel makers to compete with foreign steel makers, it has been necessary to devise a new kind of lake transportation. Ships of 10,000 and 12,000 tons burden have been constructed which convey ore at small cost through the Great Lakes, and which are without a counterpart anywhere in the world.

**V. The Handling and Shipment of Iron Ore.**—The above-mentioned fact that iron ore is mined in the middle West and smelted in the East has necessitated not only the construction of special freight-carrying steamers, but also the designing of special machinery for loading and unloading the ore from the steamers.

**VI. Freighting on the Mississippi.**—Freighting on the Mississippi is a more important industry than most of us may realize.

**VII. The Steel Industry.**—One of the greatest steel plants in the world is that which has been built at Gary.

**VIII. The Freight Subway System of Chicago.**—Chicago can boast of a rational system of handling freight by means of subways.

**IX. The Water Supply of Chicago.**—Chicago's source of water is Lake Michigan. The city is supplied with water by means of a tunnel which extends two miles out into the lake.

**X. Reclaiming Arid Lands.**—The United States Government has under way many irrigation projects for the purpose of reclaiming lands which are arid, but which will blossom if properly watered.

**XI. Harvesting the Grain of the Middle West.**—Farms that cover not acres but square miles, crops that aggregate not simply bushels but car-loads, have rendered it necessary to plant and harvest on an unprecedented scale in the middle West. The ingenious agricultural machinery which has been designed to cope with these peculiar conditions is described and illustrated.

The Middle West Number will be more than twice the size of the regular SCIENTIFIC AMERICAN. It will be lavishly illustrated. It will be contained in a colored cover which strikingly depicts Chicago's grain elevators at work. Order from your newsdealer or from

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with the distance to which the cylinders are moved back beyond the tube ends. This distance is marked by a scale upon which is read the point where the subject first perceives the perfume, and thus is the acuteness of each nostril determined.

Taste is measured by solutions of sugar, quinine, tartaric acid, salt, etc., which are more and more diluted with water until the tongue—to which they are applied with a dropper—no longer perceives the flavors; and the weakness of the solution marks the acuteness of the subject's sense of taste.

When testing for acuteness of touch, the examiner holds what appears to be a rimless wheel from whose hub radiate a score of slender spokes. From the free end of each hangs a thread of slenderest cocoon fiber suspending a small disk of elder pith. All of the disks are of equal size and apparently of equal weight, but in reality are surmounted by tiny buttons of metal which give them different weights, varying from one to twenty milligrammes (1/65 to 20/65 of a grain). The subject being blindfolded, the examiner, commencing with the lightest disk, successively lowers one at a time upon the subject's skin. Several of the lighter disks are not felt, but soon there is applied one that is, and the weight of this lightest disk perceived determines the subject's sensitiveness. There are additional devices for measuring the various other elements of feeling, such as perceptions of weight, temperature, pressure, pain, etc.

## INDOOR BED TENTS.

(*Concluded from page 416.*)

in the room, and two persons can sleep in the same bed, while only one uses the tent.

This, so far, has been a most successful device for admitting fresh air on sanitary principles to a sleeping room. It enables one to breathe the outside air without danger of being chilled or exposed to drafts and colds. Some who tried this tent felt that the fresh air was too cold in storms or wet weather, and they use an outside awning, which can be adjusted at pleasure. With these tents the body can be kept warm, while the head, which is toughened to the cold, can obtain the stimulation it needs. This last can be modified by a Canton-flannel hood, which can be made so it will come down over the shoulders, and have a face opening large enough to leave the eyes, mouth, and nose exposed. The cape of this hood covers the shoulders if by any accident the bed clothes slip off them.

Fresh air allays sweating, provides good sleep—these tents are capital for insomnia—and helps the appetite. The cold air increases resistance to disease, purifies the blood, and prevents consumption, three reasons why one should breathe it at night. The theory of keeping the head in the cold and the body warm is that the body loses eighty to ninety per cent of its heat through the skin by radiation, and cold is bracing only when it comes in contact with the respiratory organs. On this theory, no good results are obtained when the feet and lower limbs get cold. On a cold night one can move away at least twelve inches from the window and still be under the tent, get perfect circulation, and be sure of getting up in a warm room in the morning.

Not so many years ago Americans as well as foreigners were afraid of the night air, though we have no such malarial districts as around Rome. Fortunately, we are learning to know better, and workers in Little Italy and the slums where foreigners congregate in cities are pushing the fresh-air movement with all their might. Fresh air and plenty of it is the best preventive for consumption, the grip, bronchitis, common colds, and pneumonia. Some sort of inside window tent and paper napkins, tissue paper, or pieces of gauze which are now used by some people for handkerchiefs, are destined to go a long way toward keeping people well, warding off disease and the "Great White Plague."