

STOVE WITH AN ADJUSTABLE FIREBOX.

BY GEORGE J. JONES.

A great improvement in the construction of stoves has been recently made in a design just placed on the market, which has a number of novel features, the most notable of which is the adjustable firebox, by which the size and intensity of the fire can be regulated at all times. For instance, it is a waste of fuel to get up a fire capable of roasting a piece of meat when it is merely desired to cook a light meal for one or two persons. With the stove referred to it is possible to secure four different sizes of firebox, so that the size of the fire can be regulated to suit the emergency. This stove is made by the Cahoon Company, of Minneapolis, Minn., and a view of it is shown in the accompanying photographic view. The front of the grate is attached to the frame of the door and swings on a pivot, which is designated by the letter A. This grate is saucer-shaped, and when it is desired to get the full fire-box capacity, the bulge is turned outward, thereby increasing the capacity of the firebox by 156 inches. All ordinary purposes will be answered, it is said, by the use of the grate turned in. There is an auxiliary grate, which is put in place by removing the first row of covers in the back of the firebox and dropping it in with the use of a stove-lifter, and this confines the fire to one end, which is sufficient to answer a great many purposes. Then again there is a grate partition which is also dropped in place with the assistance of a stove-lifter, which confines the fire to the space under a single lid.

The latter attachment was designed for summer use, and with a mere handful of fuel required it is possible to cook chops or omelet or boil tea. Without this grate partition in place, maintaining the fire at one end of the firebox, it is possible to get the stove up to a fine baking heat.

Another feature of this stove is the fact that the air supply is delivered into the firebox superheated. In the picture, the casting has been removed from the front end of the firebox, showing the port holes for the admission of air. The air is carried from these holes through a series of chambers, and by the time it reaches the fire it is thoroughly heated. This greatly facilitates combustion, which is said to be so complete in this instance that there is no smoke or soot arising from the fire and the ashes show that the fuel has been thoroughly consumed. Garbage and other household waste can be thrown into the fire and will be consumed without the least odor. Bituminous coal burns beautifully without any objectionable features of any character. For this purpose a special grate is furnished, which is shown in the cut on the floor at the side of the stove.

The Mont Blanc Railway.

M. H. Duportal, the French Inspecteur Général des Ponts et Chaussées, has selected St. Gervais as the starting point for the railway which, it is hoped, in a few years will reach the summit of Mont Blanc. A line to the summit of the great White Mountain of Savoy has long been the dream of engineers, and at least three plans, devised previously to the accepted one of M. Duportal, have received serious consideration; but of these the only one which now occupies the attention of engineers is that identified with the name of M. Vallot, the Director of the Mont Blanc Observatory.

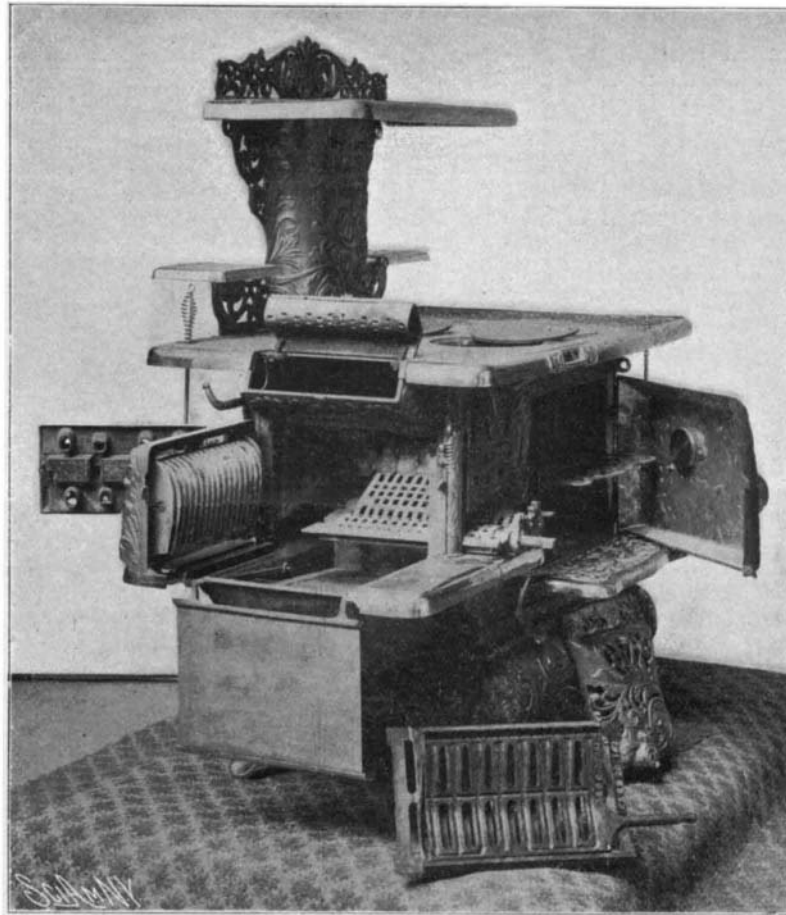
M. Vallot's project is a railway starting from Les Houches, opposite the present station of the P. L. M., a line which, after crossing the tremendous torrent of Le Bourgeat, enters a tunnel and continues practically subterranean throughout to the Petits Rochers Rouges, about 450 meters horizontal distance from the summit, and traced by way of the Gros-Bechar, the Aiguille du Gouter, and the Bosses, the total length being about eleven and one-half kilometers. The idea, here, seems to be to get the shortest possible and most sheltered line, enabling the summit to be reached in all seasons; and it is conceded that M. Vallot's survey is the best possible for the purpose.

M. Duportal's scheme does not supersede its predecessor, however; rather, it will prepare the way for it; and it has the great merit of serving the immediate and practical necessities of the district. The first section of the proposed electric line reaches the Aiguille du Gouter almost direct from Fayet by way of the Boinnassay Valley. The right side of this valley formed by the buttresses of the Prarion, of Mont Lachat, of Les Rognes, of the Tête Rousse, and of the Aiguille du Gouter, faces full south, and consequently is always free from snow early in the year, at any rate as far as the Tête Rousse. An open-air line by this route is therefore feasible; and this is important from the point of view of tourists, who naturally desire to see the marvelous perspectives of the moun-

tains—which would be impossible if the line should be tunneled all the way. Moreover, it renders that beautiful upland called the Prarion available to all the world.—N. Y. Times.

A Curious Water Power.

We have been favored by one of our correspondents in Clarksville, Tenn., Mr. J. M. Macrae, with an interesting description of a curious water power which was made possible by the difference in level of the river, which has such a sinuous course that the two branches at one point are separated by a very narrow neck of land. The Elk River, in Franklin County, Tenn., furnishes power for lighting the towns of Tullahoma and Winchester, as well as for the waterworks at both places. At this point there is a bend in the river, the distance around being about one mile. At the point where the power house was built the width of the neck of land is but 30 feet, so that it was possible to see the two sections of the stream flowing in opposite directions. The bluff which divides the stream is about 40 feet high, and this isthmus is about 100 yards long. There is no room on the top of the bluff for a road, and there is only a footpath. At the narrowest point the bluff is cut through. A temporary dam was then thrown across the stream, turning the water through the cut and leaving the bed dry for the construction of a permanent dam, which is of concrete, and is 18 feet high and 10 feet wide at the bottom, while the width at the top is 4 feet. The concrete dam occupies the bed of the river, which is about 100 feet wide at this point. On a low bank opposite the power



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house an embankment was thrown up, joining with a wing of the dam. The power house is equipped with three turbines, which developed 300 horse power. The current is delivered to Winchester at a pressure of 2,000 volts, and to Tullahoma, 10 miles away, at a pressure of 10,000 volts, which is stepped down to 2,000 volts for consumption. The plant is the property of the town of Winchester, and the cost of the dam, machinery, wiring, water pipes, and tank was about \$60,000. It will, of course, be remembered that during the civil war Gen. Butler cut off a circuitous water route on the James River, Va., by digging his famous "Dutch Gap" canal.

A parliamentary return issued on September 13 gives the amount of the trade of the British colonies and possessions with the mother country and foreign countries for the years from 1890 to 1900. In that period the imports into the British colonies from all countries increased by over £48,000,000; imports from the United Kingdom increased by £6,000,000; imports from colonies increased £13,000,000; and imports from foreign countries £29,000,000. In the same period the exports from British colonies to all countries increased by £51,000,000. Of this increase £22,500,000 went to the United Kingdom, £10,000,000 to British possessions, and £18,500,000 to foreign countries. In the year 1900 the trade done by the colonies with the United Kingdom and colonies was roughly £316,500,000, and the trade between the colonies and foreign countries £167,500,000. The returns include bullion and specie.

Lord Salisbury as a Man of Science.

With his characteristic modesty and retiring disposition Lord Salisbury never claimed to be a man of science, but all who listened to his presidential address "On the Unsolved Riddles of Science" delivered before the meeting of the British Association at Oxford in 1894, were deeply impressed with the comprehensive grasp which he had upon the development of science in all of its branches. On that occasion he certainly did not confine himself to a mere generalization of the scientific position; on the contrary, he alluded, and with a freedom which completely surprised those who devote their time almost exclusively to scientific study, to many of the minutest details in the problems which occupy the attention of the chemist, physicist, biologist, and astronomer. He discussed the foundation of the atomic theory, the nature and origin of the so-called elements, the spectroscopy in its application to the study of solar and stellar phenomena, ether, and Hertzian waves, bacteriology, and the theory of natural selection, and did so with the confidence of one who knew his ground. This gave great conviction to his conclusion that the advances in each section of knowledge had been very great, while the hope of penetrating the prime mystery of all seemed as far off as ever. Lord Salisbury confessed to being pessimistic as to whether we should ever gain a clear insight into the nature and origin of life. It was characteristic of him, viewed in the light of his known mental attitude in other provinces, that he chose to survey the state of our ignorance rather than the proud position of our science. "We live," he said, "in a small bright oasis of knowledge surrounded on all sides by a vast unexplored region of impenetrable mystery, and from age to age the strenuous labor of successive generations wins a small strip from the desert and pushes forward the boundary of knowledge."

Lord Salisbury was reluctant to accept the views of the Darwinian school. He delighted in contrasting the deductions of the mathematician and geologist with those of the biologist upon the question of when life was first possible upon this planet.

It is generally understood that the branch of science which Lord Salisbury loved best was chemistry, and the freedom with which he discussed chemical questions gives weight to the suggestion. Besides, it was well known that he spent much time in his laboratory in Hatfield House, where, however, he directed his attention also to engineering and electrical problems. He conceived the idea of utilizing the flow of the river Lee for the electric lighting of the house, and the provision of a water-supply to the town of Hatfield from the mains of Hatfield Park was due to his thought and kindness. In many ways he showed that his love of science had practical as well as academic leanings, but he made no original communication on scientific subjects to the learned societies. He was elected to the Fellowship of the Royal Society in 1869 and almost immediately became a member of the council. He took a keen and active interest in the internal affairs of the Royal Society, for he served on the council in 1882-83, and again in 1892-94. He was vice-president also in 1882-83 and in 1893-94. And almost his last

public act was associated with science and not with politics, for on the occasion of the election of the Prince of Wales to the Fellowship of the Royal Society in April last it was Lord Salisbury who introduced him to the President and Fellows. Lord Salisbury's name is not associated with a single popular measure of the kind that would be sure to win medical approbation. But medical men could see in his attitude toward life the trained and austere thinker. He did not speak if he did not know; he would not proceed to the next step till he had verified the one on which progress should depend; and having convinced himself in which direction truth lay he would hold firmly to his convictions.—Lancet.

Spencer's Airship.

Spencer's airship sailed from Crystal Palace, Sydenham, around St. Paul's Cathedral and over miles of the densely-built part of South London. The airship descended safely after a fairly successful flight at New Barnet.

In 1901 there were 1,529 persons killed and 7,988 persons injured on the Russian railways. According to the mileage, there were on the State railways in European Russia 18.66 accidents to persons, on an average per 700,000 miles, 17.10 accidents on the private railways, and 14.52 cases on the state railways in Russia. The total injured was about one-fifth of the number injured in the United States every year and the total number of accidents is in about the same proportion.

Sanitary Regulations of Barber Shops.

The last Legislature of New York State passed a sanitary code for the regulation of barber shops. The law has only recently taken effect. The Board of Health of New York has adopted the following rules in order to properly enforce the provisions of the State code. They are so reasonable and wise that we call attention to them with the hope that municipalities of other States where no such law prevails will demand the passage of similar legislation. The rules of the New York Board of Health are as follows:

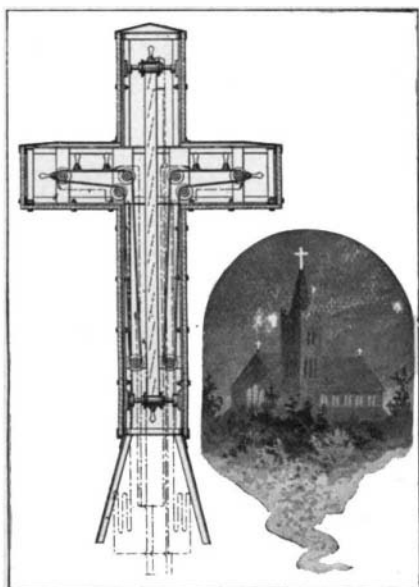
1. Barbers must wash hands thoroughly with soap and hot water before attending any person.
2. No alum or other astringent shall be used in stick form. If used at all to stop the flow of blood it must be applied in powder form.
3. The use of powder puffs is prohibited.
4. No towel shall be used for more than one person without being washed.
5. The use of sponges is prohibited.
6. Mugs and shaving brushes shall be thoroughly washed after use on each person.
7. Combs, razors, clippers, and scissors shall be thoroughly cleansed by dipping in boiling water or other germicide after every separate use thereof.
8. No barber, unless he is a licensed physician, shall prescribe for any skin disease.
9. Floors must be swept or mopped every day and all furniture and woodwork kept free from dust.
10. Hot and cold water must be provided.
11. A copy of the regulations is to be hung in a conspicuous place in each shop.

The most of these rules are now observed by every well-regulated barber shop, but the cheaper barber shops rarely pay attention to all the necessary sanitary precautions in serving their patrons. The evils arising from unsanitary barber shops have long been known, and we are glad to note the growing tendency to correct them.

ILLUMINATED CROSS FOR CHURCH TOWERS.

An illuminated cross at the top of a church steeple can be seen from a great distance and presents a very pleasing spectacle; but such illumination is seldom provided owing to the difficulty of reaching the lamps when they need repairs. The expense of hiring a "Steeple Jack" to replace a lamp whenever it burns out would obviously far outweigh the artistic benefits derived from such illumination. However, an invention recently patented by Joseph A. Blenke, of Covington, Ky., provides a very simple means of gaining access to the lamps. The means used will be comprehended by a glance at the accompanying illustrations. It will be observed that the incandescent electric lamps are mounted on belts which are stretched over pulleys. The vertical and two horizontal arms of the cross are each provided with a separate belt. The arrangement is such that the lowest pulley of each belt may be easily reached from the base of the cross. The lamps are inclosed in a glass case having the shape of a cross. The glass is preferably ground or frosted, so as to diffuse the light and distribute it more evenly in the form of a cross.

When for any reason it is desired to gain access to any one of the lamps the tower is ascended, and the

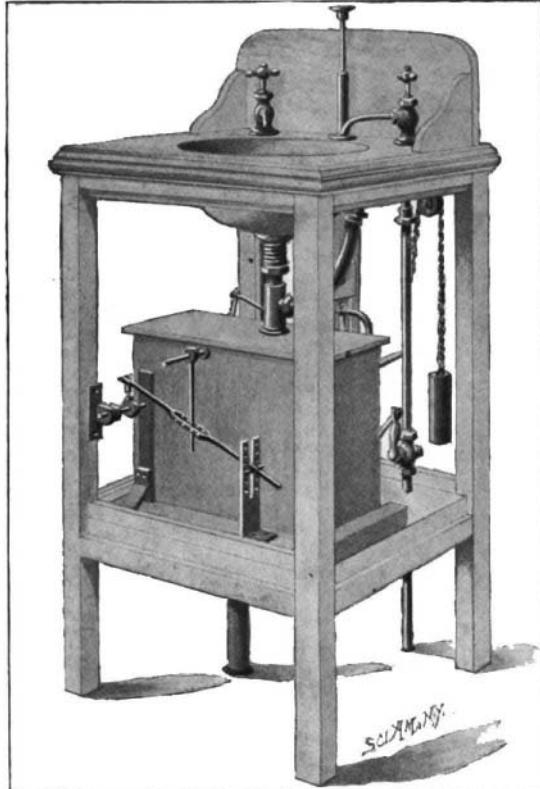
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belt on which the lamp is mounted may be reached through a door in the casing near the base. On pulling this belt the lamp will be drawn down to within reach of the hand. The wires through which the current is fed to the lamps have sufficient slack to permit the belt to be moved to a limited extent. After the lamp has received the necessary attention or been replaced by a new one, the series of lamps may be again returned to the normal position by drawing

on the belt. All parts of the illuminated cross are thus rendered readily accessible to the electrician.

DEVICE FOR PREVENTING WASTE OF WATER.

Most sinks and basins are provided with outlets to prevent overflowing of the basin in case the water is left running by some careless individual. This precaution is good as far as it goes, but it does not prevent waste of the water, which, in some localities, is quite expensive. A recent invention, which is to be accredited to Mr. Warwick Ford, of 157 West 14th Street,

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New York city, is adapted to meet the requirements by providing means for shutting off the supply of water after the basin has been filled up to the overflow outlet. We show herewith a general view of the invention. The overflow pipe leads down from the basin into a small tank pivoted within a larger tank shown beneath the basin. The small tank is prevented from tipping forward by connection with a weight shown at the right in the illustration. Overflow water from the basin runs into the small tank until its weight causes the tank to tip and empty its contents into the larger tank, whence the water flows off through the waste pipe. Now, when the small tank swings downward the shaft to which it is secured is rocked, and this motion is utilized, by means of connecting levers, to turn the stop-cocks on the water-supply pipes, thus shutting off the flow of water. At the same time the stopper of the basin is lifted off its seat, permitting the water in the basin to flow out. When it is desired to use the basin again it is only necessary to push down the slide rod, which is shown between the faucets, and then lift it up again. This rotates the shaft, restoring the parts to their original positions. In order to empty the basin when no overflows occur, the slide rod is pushed down, which causes the main shaft to turn and lift the stopper off its seat. The main shaft may be seen projecting from the tank at the extreme left of our illustration. The crank arm on this shaft is connected to a rod resting at its forward end in a forked bracket. Midway of the rod is the slot into which an arm from the second shaft projects. By means of this connection rotation of the main shaft causes the second shaft to turn on its axis, and the relative amount of moisture can be regulated by raising or lowering the outer end of the connecting rod and by shifting the depending arm to different points in the slotted rod. The secondary shaft operates the stopper of the basin by means of a connecting rod passing up through the discharge pipe, and the adjustment just described is necessary to insure accurate seating of this stopper and perfect closure of the discharge pipe.

A System of Transporting Fruit Without Ice.

A car of Valencia late oranges of the Pet brand from Pomona, Cal., was recently shipped from San Dimas and packed by the Citrus union there, coming through under what is known as the Baker system of transportation.

The oranges were of poor quality and the packing the same. The fruit, however, opened in good condition, proving that fruit can be shipped from California without ice, under a proper system of treatment under some known process.

The Baker process consists in confining the food products in a dry atmosphere of medium temperature

charged with a harmless, antiseptic, germicidal gas. The effect is claimed to destroy or make dormant the germs or bacteria, both in the atmosphere and on the food products, and by uniting with the exuded juices of such food products to form a germ-proof coating which not only excludes other germs or bacteria, but also prevents the further evaporation of the juices.

Progress in German Cable Laying.

A new era in German cable construction began with the laying of a cable to Vigo, Spain, a distance of about 1,300 miles.

During the last seven years, Germany has laid 7,375 miles of cable, at a cost of over \$7,000,000. In 1898 a cable, 73 miles in length, was laid between Sassnitz and Trelleborg, and in 1899 German Southwest Africa was connected with the international telegraph system by a cable 154 miles long.

In 1900 the first German-American cable between Emden and New York, via the Azores—a distance of 4,813 miles—was laid. At about the same time Germany put down the first German cables along the Chinese coast, the cable Tsintau-Chefoo being 285 miles and that connecting Tsintau and Shanghai 438 miles long. The year 1901 witnessed the laying of the fifth cable between Germany and England, connecting Borkum and Baktou, a distance of 280 miles. The telephone cable between Fehmarn and Laaland was laid in 1902.

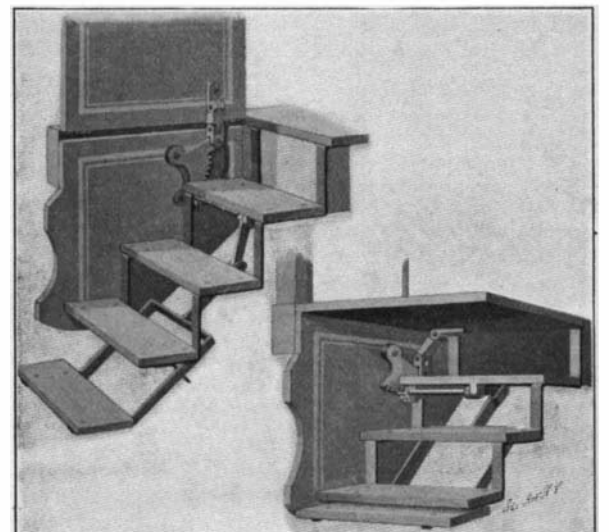
The construction of a second trans-Atlantic cable between Emden and New York, via the Azores, has been commenced and it will, it is expected, be ready for service before the expiration of the next year. Germany is also contemplating an increase of her cable net in eastern Asia and the South Sea, by constructing cables between Alenado and Guam and the Palau Islands and Shanghai.

It is said that the growth of German interests, both military and commercial, will in the future require the building of more cables by Germany, independent of foreign nations. Germany now has cable works and two cable steamers.

FOLDING STEP FOR VESTIBULE CARS.

Our columns recently contained a description of a folding step for railway cars, which could be lowered at stations to permit passengers to mount from or dismount to the low station platforms now almost universally used. The folding step was lowered or raised by means of a lever at the side of the car and was obviously much more convenient than the cricket or portable step which trainmen have heretofore been obliged to carry. The inventors of this step, Mr. James H. Fassett, of Nashua, and Mr. John E. Warren, of Greenfield, New Hampshire, have recently adapted their invention to vestibuled cars, and in doing so have hit upon an important improvement. In the present invention no lever is required for operating the step, but the same is automatically lowered and raised by connection with the hinged platform usually found on vestibuled cars.

The accompanying illustrations show the step in its two positions. The step, it will be observed, is carried on a forked arm which slides in a guide back of the fixed steps. At its upper end the arm is connected to a crank-arm on one end of a shaft. A gear-wheel is keyed to this shaft at the opposite end and meshes with a toothed sector connected by a link to the hinged platform of the car. Obviously, when the platform is

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raised, the sector will be drawn upward, rotating the gear-wheel and swinging the crank-arm downward, which throws the step out to proper position for use. When the platform is lowered the reverse takes place, and the step is drawn up to folded position beneath the lowest fixed step. In this way the supplementary step is operated without requiring attention of the trainman or causing him any more labor than the usual task of operating the platform.