

**ELECTRIC HEATING IN A CARMELITE HOSPICE.**

The development of electrical power at Niagara Falls in vast quantities has resulted in the installation in the new Carmelite Hospice of an electrical plant for cooking and heating which has not its equal in the world. This hospice is located on the Canadian side of the river some distance back from the falls. It is on a bluff and from its windows a most magnificent view of the Niagara scenery is obtainable. Its location removes it from the circle of the falling spray cloud, but it is close enough to the cataract to secure the benefit of the electrical development made by the Canadian Niagara Power Company in the power station of the Niagara Falls Park and River Railway. This installation of the Canadian Niagara Power Company is a temporary construction, and in time will be supplanted by the magnificent development the company intends to make under the franchise it holds in Queen Victoria Niagara Falls Park.

In the power station of the Niagara Falls Park and River Railway, the Canadian Niagara Power Company has installed two 1,000 horse power generators, the power from which is used for various purposes, but there has not yet been a demand of any magnitude for power on the Canadian side at Niagara. From this power station to the transformer house of the hospice, two miles, the current is conducted on bare copper wires. About 100 horse power is used in the hospice, 25 horse power for lighting, cooking, and heating water, and 75 horse power for heating the lower floor of the building.

In the transformer house of the hospice has been installed two 30 K. W. Westinghouse and one 25 K. W. General Electric transformer, primary 2,200 volts and three-phase secondary 110 volts, current being transmitted through underground cable to the switchboards located in the basement of the main building. One of these switchboards is shown in the illustration. The switchboard with double-throw switches controls two phases of the current, while the third phase is controlled by a switchboard adjoining the first one, and is used for cooking, lighting, etc. The arrangement of the switchboards is such that either transformer can be used independent of the other for either purpose.

The present building is but a wing of the structure contemplated in the plans of the Carmelite Fathers. In this building two hundred 16 candle power lights are used for illumination, and on the lower floor, which is heated by electricity, there are eleven bedrooms, a dining room, a reception room, and office. The corridor of this floor is 120 feet long, 10 feet wide, and 15 feet high. This corridor contains nine 4 horse power electric heaters, and in each bedroom, which is 10 by 12 by 15 feet, there is one 4 horse power electric heater with changeable heat switch of two heats.

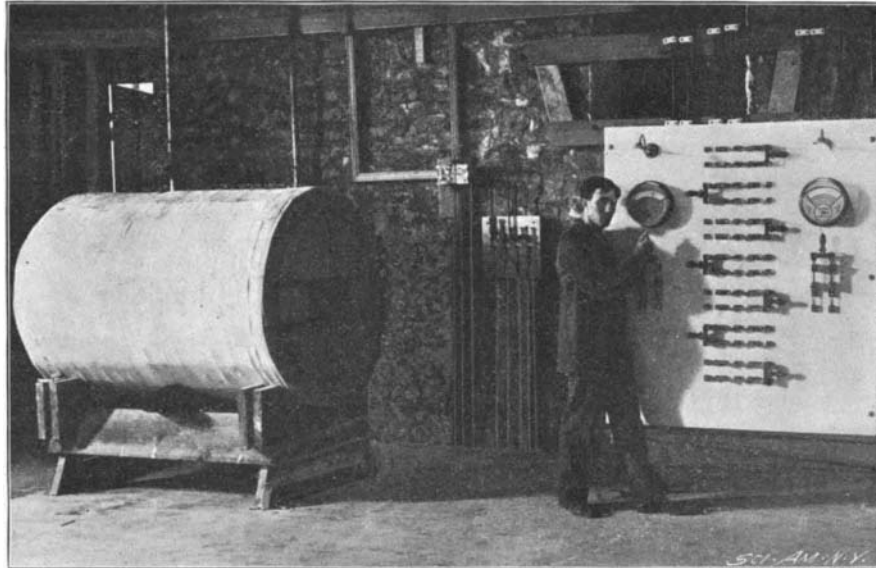
In the butler's pantry there are three 5-gallon urns and a chafing dish electrically operated. One of the urns is used for tea, one for coffee, and one for boiling water to supply the coffee and tea urns.

In the kitchen are to be found features that are most interesting. The range has a heating surface of 6 square feet, and each square foot of surface has a switch and can be controlled to full or half heat at the will of the operator or cook. The baking and roasting facilities are included in two small and one large oven. Each of the two small ovens has three compartments and consumes 23 amperes at 110 volts, while the large oven takes 50 amperes at the same voltage. This large oven is so arranged that it will roast four 25-pound roasts of meat at one time. Some idea of the work this equipment in this electrical kitchen will do may be gained from what was accomplished in it on June 15, the occasion of the blessing of the building and its formal opening for sacred purposes. At that time all the meats for two hundred and fifty people were cooked in two and one-half hours, while all the other cooking for the same number of people was done at the same time. This is with the exception of the soup, which was made the day before, as it requires

many hours of attention to be good. As the heat of all the apparatus is uniform, the liability to burn is less than with other fuels. As the point of baking or roasting is plainly indicated, the cook can make no mistake. In the small ovens bread can be baked in 18 minutes.

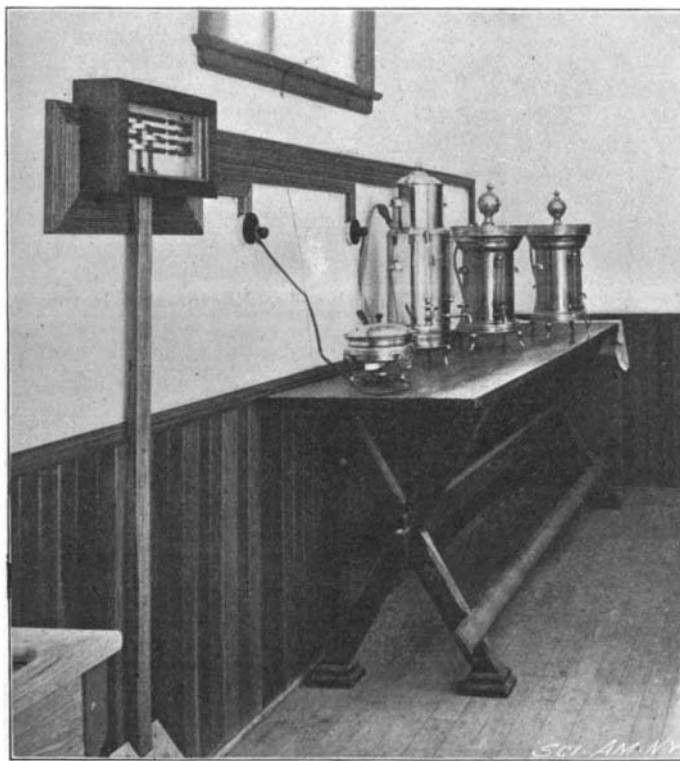
all the water at the time the current is not being used for other purposes. In the 400-gallon boiler water is raised from 60° to 212° in six hours, with full heat.

Naturally the main interest in this plant centers on the cost of the service; and here it may be said that the experience in the operation of the hospice plant can hardly be taken to form comparison with what the same service would cost elsewhere. This is because there are some exceptional features of cost found in this installation. The 25 horse power used for hot water heating, cooking, and for lighting purposes, cost \$25 per horse power, but the 75 horse power used for heating the corridor and bedrooms is obtained at about one-fifth of this cost per horse power. It is evident that this power is not used the year around; and then another feature is that in the station of the Niagara Falls Park and River Railway there is always a surplussage of power in the winter time, as the business of the road is mainly a summer one. For this reason the same number of cars are not run in the winter as are run in the summer, and, therefore, not so much power is demanded from the power house.



**SWITCHBOARD AND 400-GALLON TANK FOR WATER HEATING.**

In one of the illustrations, at the left of the switchboard will be noticed a large tank. This is the 400-gallon boiler in which water is boiled for the laundry and bathroom purposes. It takes a current of 120 amperes, being divided into three heats. Opposite this 400-gallon boiler, but not shown in the illustration, there is a 150-gallon boiler, in which water is boiled for



**ELECTRICALLY OPERATED COFFEE AND TEA URNS.**

kitchen purposes, but its services can also be used in connection with the large boiler. This small boiler takes 125 amperes for its operation, being also divided into three heats. This small boiler is used mostly for quick boiling. Both boilers are covered with 2½ inches of asbestos covering. An effort is usually made to boil

In view of the approaching French exposition, it will be interesting to note the enormous increase in the extent and success of the various expositions held at Paris.

The first occurred in the year 1798. It brought together the modest number of 110 exhibitors and cost only 60,000 francs. The buildings, of wood embellished, were erected on the Champ de Mars. Twenty-five medals were distributed.

The second took place three years later (1801) in the court of the Louvre. It represented 220 exhibitors and quite eclipsed the first.

A third exposition, opened the following year at the same place, collected 550 exhibitors. This was a veritable triumph.

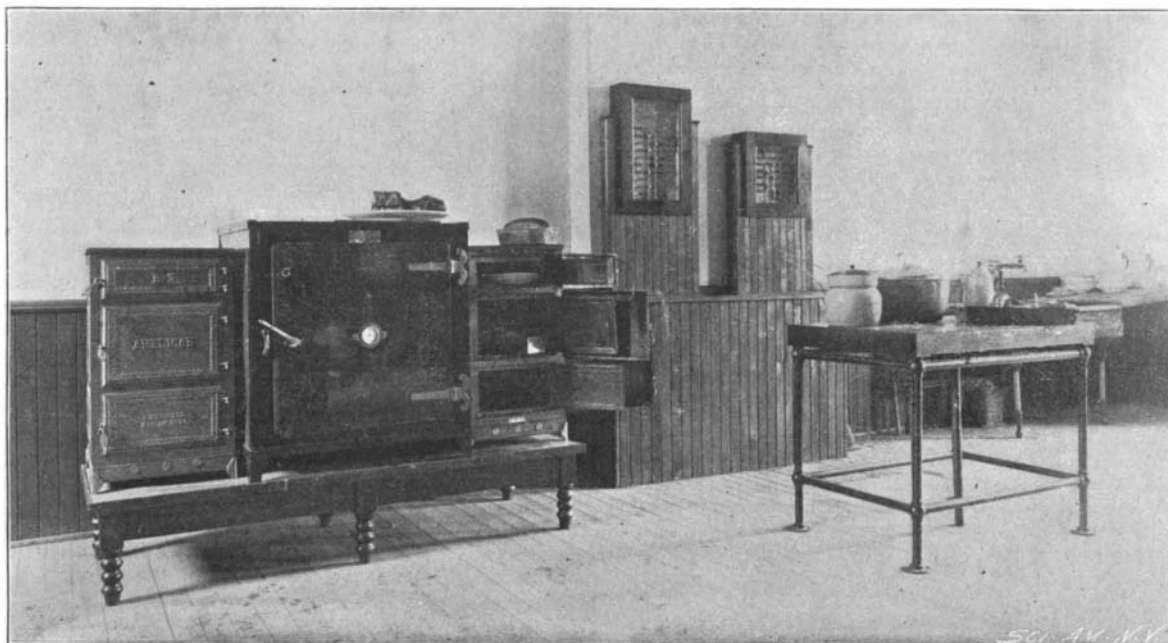
Napoleon I. inaugurated the fourth exposition, which was held on the Esplanade of the Invalides in 1806; there were 1,422 exhibitors. This figure was carried to 1,622 at the fifth exposition in 1819, in the Palace of the Louvre. The sixth (1823) met with little success, as also the seventh in 1827 in the reign of Charles X., in the Palace of the Louvre. As an offset, the eighth, opened on the Place du Carrousel in the reign of Louis Philippe, gathered no less than 2,487 exhibitors. This success was accentuated in the exposition of 1839, held on the Champs-Élysées (3,381 exhibitors) and in that of 1844, also on the Champs-Élysées (3,960 exhibitors). The exposition of 1849, again on the Champs-Élysées, extended over a surface of 2,200 square meters and cost 6,000,000 francs.

The first universal exposition was that of 1855, which caused the construction of the Palace of Industry. The surface covered was 168,000 square meters and the expense rose to 11,500,000 francs. There were 23,954 exhibitors and more than 5,000,000 visitors. Then came the well known expositions of 1867 (52,000 exhibitors and 687,000 square meters), of 1878 (52,835 exhibitors and 16,000,000 visitors), and 1889 (55,486 exhibitors and 32,500,000 visitors).

**Discoveries in Alaska.**

The party of scientists who went to Alaska as the guests of Mr. Harriman are meeting with success, and have made several important discoveries.

Among these is an immense bay extending inland for over twenty miles. At the upper end of this bay they discovered a great glacier inferior only to the Muir glacier in size. It has been named "Unknown Bay." Four other new glaciers which have never been seen by white men were found at the head of Disenchantment Bay. In Icy Bay an immense glacier was discovered, and was named "Harriman's glacier." New plant species have been found by the botanists, and the collection of marine species is expected to surpass any other yet made in the northern waters. Many other discoveries were made in bird life.



**KITCHEN OF THE CARMELITE HOME EQUIPPED WITH ELECTRIC STOVE AND OVENS.**

**A Notable Feat of Bridge Moving.**

A notable engineering feat was performed a few days ago by the substitution of a new 500-ton drawbridge for an old and much lighter one where the Pennsylvania Railroad tracks pass the Passaic River near the Market Street station, Newark, N. J. The actual substitution of one bridge for another was made in eighteen and one-half minutes. The old drawbridge, which was built in 1868, was 213 feet long. The river at this point is 400 feet wide. At both sides of the river stationary spans are at the ends of the draw. The delay of traffic is, of course, most serious on a railroad like the Pennsylvania. It is easy enough to rebuild stationary parts, even where trains run over them every few minutes, but the substitution of one drawbridge span, weighing some hundreds of tons, for another, was a serious and interesting problem. When open the ends of the draw rested on fenders, which protect the structure from injury by passing boats. The engineers lengthened these fenders up and down the river until it was 250 feet long and capable of sustaining the weight of the draw. The new draw was erected on the southern fender, and it rested on eight railroad tracks, which in turn rested on rails. The space between the fenders and the central pier of the draw was filled with piling and capped with rails. Sunday was selected as the best day for doing the work, as then the traffic is the lightest. When the time came for moving, jacks were put under the old draw, and it was lifted clear of its pivot and raised to the level of the new one, and the two were lashed together with wire rope. Powerful hawsers were roved between blocks from the upper end of the old bridge to the drums of two stationary engines, which were started a few minutes after traffic was stopped. In eight minutes the old bridge was clear of its structure and moved onto the upper extension of the fender, and in another ten minutes the pivot of the new bridge was exactly over the socket, and in half an hour more the new bridge had been lowered on this pivot and the gear by which it is worked from an engine overhead had been fitted. The actual substitution of one drawspan for the other was made in eighteen and one-half minutes.

**Repairs to the "Buffalo."**

Repairs have been begun on the cruiser "Buffalo" at the Brooklyn navy yard. When they are completed, the vessel will be an excellent addition to the navy. She will be fitted for special transport duty between

New York and Manila. The entire interior of the vessel will be remodeled and many improvements will be added. The engine room will be refitted and regular man-of-war quarters will be added. An ice machine will be introduced, and a larger evaporating plant has been purchased for the vessel. About \$40,000 will be spent in these improvements, so that the ship will be worth at least \$700,000. She will be painted white and fitted with a number of modern guns. We have already, on other occasions, given the history of this vessel.

**Automobile News.**

An automobile club is to be formed in Philadelphia. Steam wagons are to be employed in hauling borax in Oregon.

According to The Motor Car Journal, the Austrian Ministry of Commerce is reported to be contemplating the introduction of motor cars for the conveyance of mail bags to and from the railway stations as well as for the delivery of parcels post packages and the collection of letters from the pillar boxes.

The *Matin's* nine-day automobile race around France terminated at St. Germain on July 24. The winner was M. René de Knyff, a Belgian, who covered the distance (1,428 miles) in 44 hours, 44 minutes, 9 seconds, or at an average speed of about 32 miles per hour. In many parts of France the country was hilly and sometimes mountainous, and the carriages provided with the greatest horse power showed themselves to special advantage in hill climbing.

Mr. and Mrs. Davis have, owing to accidents to the machinery of their automobile, only reached Syracuse. The trip will be continued July 29.

Messrs. Haynes & Apperson, builders of an automobile of the same name, are making a trip from Kokomo, Ind., to Brooklyn. No attempt at fast time is being made and the average speed is fourteen miles per hour.

The automobile show at the Tuileries Gardens, Paris, has been very successful, and the number of vehicles shown has been very large and the exhibits are valued at over half a million dollars. The electric vehicles are particularly in evidence. Many of the French vehicles seating from two to three people rose in price from \$700 to \$1,200.

In France automobile accidents are becoming many and serious, and, unfortunately, the victims are usually the automobilists themselves. The former mayor

of Ay, M. Bollinger, was riding in his automobile down a hill; they were going at a pretty good pace when the brakes failed, and suddenly the carriage, for some unaccountable reason, turned completely over, all the passengers being thrown underneath the vehicle. M. Bollinger was instantly killed and the others were seriously injured. In Belgium a well-known sportsman ran over a child with his motor cycle, broke the child's arm and leg, and he received a fractured skull. M. Pierre Giffard, an authority on the subject, attributes the alarming and constantly lengthening catalogue of accidents to excessive speeds which the drivers give their carriages.

**The Current Supplement.**

The current SUPPLEMENT, No. 1231, has many articles of unusual interest, the most important being "Geodetic Work in Spitzbergen," by Prof. J. H. Gore, an illustrated article of great interest. "Microbes in Co-operation" is by G. Clarck Nuttall. "New French Automobile Fire Engine" is described and illustrated with drawings, giving details of the mechanism. The usual "Trade Suggestions of the United States Consuls," "Miscellaneous Notes," "Selected Formulæ" and "Trade Receipts and Suggestions" are published. "Building Railways in the Field by the Railway Corps of the German Army" is an illustrated article showing how soldiers build railways in fields. "The Electric Tramway of the City of Tours" describes the Diatto system. There is also an interesting article on "The Nuraghi of Sardinia and Similar Structures." These are towers which compare in interest with the famous round towers of Ireland. They are of enormous size, and there are more than 3,000 on the island. "Some Experiments in Making Rubber Substitutes" is an interesting technical article.

**Contents.**

(Illustrated articles are marked with an asterisk.)

Alaska, discoveries in.....	91	Heating, electric.....	91
Automobile news.....	92	Industrial plant, subterranean*.....	89
Automobiles, meters for.....	82	Inventions, index of.....	93
Babbitt metal, melting.....	87	Inventions recently patented.....	82
Books, new.....	93	Kaaba and the holy carpet.....	88
Bridge, average life of metallic.....	82	Life saving appliance, prize for.....	83
Buffalo, repairs to the.....	92	Liquid air in medicine and surgery.....	83
Commercial needs.....	82	Patents, British, in 1898.....	83
Consuls, activity of American.....	83	Pearl button industry*.....	86
Dividing engine*.....	84	Photographs, submarine.....	88
Dredges, steel.....	83	Railway in China, American.....	82
Electrical notes.....	90	Respiration, calorimeter*.....	85
Electric heating*.....	91	Science notes.....	90
Electric storms, protection against.....	86	Submarine boat*.....	88
Engineering notes.....	89	Submarine photographs.....	88
Explosives, firing high.....	82	Subterranean industrial plant*.....	89
Exposition, Paris.....	91	Supplement, current.....	92
Flue stopper*.....	84	Terms, use of scientific.....	86
Gun, three-pounder*.....	88	Turbine water wheel*.....	84
		Wagon tongue support*.....	84

**RECENTLY PATENTED INVENTIONS.**

**Electrical Apparatus.**

**MEANS FOR PREVENTING SPARKING WHEN MAKING AND BREAKING CIRCUITS.**—ADOLPH MÜLLER, Hazen, Westphalia, Germany. A circuit in which an electromotive force is opposed to that of the current source can be broken without sparking by increasing the opposing electromotive force until it equals that of the source of current before breaking the circuit. This is effected, according to the present invention, by introducing into the circuit, before disconnection, a battery of elements which easily becomes polarized. Such a battery is immediately polarized on entering the circuit to the tension of the current within the circuit; or it immediately increases any opposing electromotive force which may be present in the circuit until that force is equal to that of the source of current.

**INCANDESCENT LAMP.**—ANDREW H. MILLER, Central City, Colo. The filament of this incandescent lamp is in two sections and is associated with such connections as permit it to be cut in and out of circuit in a variety of ways, thus permitting the regulation of the power of the lamp. By means of the invention three distinct adjustments and hence three distinct candle-powers can be obtained. This renders the lamp especially desirable in hotels and hospitals where it is desired to vary the power of the lamp.

**Mechanical Devices.**

**FLOOR-SURFACING MACHINE.**—HENRY McLOUGHLIN, Leavenworth, Kans. In the wheel supported frame of the machine a primary-movement shaft is mounted, having a slidable worm meshing with a worm-wheel. A clutch member fast to the shaft drives the worm. Gearing connects the worm-wheel with the wheels of the frame. In a swinging frame on the main frame cutting apparatus is mounted, driven by gearing from the primary-movement shaft. By means of this machine large areas of flooring can be quickly planed or true-surfaced without excessive labor.

**Railway Appliances.**

**CATTLE-GUARD.**—JOSEPH W. ROSS, South Carrollton, Ky. The cattle-guard is of that form in which a railroad crosses a fence-line and is provided for some distance along its track with an impassable road-bed armed with spikes to prevent cattle from passing. The invention is distinguished from others of the same class by spiked zigzag plates having a bearing on the ties midway between their upper and lower angles. It is stated that thereby a convenient angle is obtained for driving the spikes, and that the ties afford a stiff backing for the plates at a point where they are especially weak and liable to be indented by the hoofs of animals.

**LOCKING DEVICE FOR CAR COUPLINGS.**—GEORGE P. STEWART, Palestine, Tex. Janney car-couplers are subject to accidental release of the knuckle from engagement with the opposite coupling. To prevent this, the inventor employs a transverse rockable lever loosely secured to the lower part of the key to control its upward movement. A pendent weighty dog on the

draw-head is hung above the free end of the lever. The upward movement of the key is prevented until lever and dog have been simultaneously lifted.

**SIGNAL-LAMP-RAISING DEVICE.**—THOMAS J. WALSH, Walton, Ky. The object of the invention is to provide a simple apparatus to raise and lower signal-lamps at railway-stations, thus obviating the danger incurred in using the customary portable ladders. At the upper end of the signal-lamp mast a lever is pivoted from one end of which a pulling device extends downwardly, and by the other end of which a pulley is carried. A rope is passed around the pulley and connected with the lamp. By this arrangement, a lamp may be raised from the station or office.

**Miscellaneous Inventions.**

**CISTERN.**—WILLIAM J. SLACK, La Grange, Ind. The inventor has endeavored to provide an improved attachment for removing foul water and sediment from cisterns. The attachment is a casting formed with circumferential flanges to adapt it for forming a watertight joint with the wall of the cistern, and with a central depression or cavity which is of conical form to adapt it to collect the sediment. A discharge passage is provided which communicates with the cavity, and which removes the sediment and foul water by siphonic action.

**SWINGING-DOOR ATTACHMENT.**—JOHN H. WHITAKER, Davenport, Iowa. Waiters in restaurants and hotels have a habit of kicking open swinging doors, thereby often upsetting their trays and dishes. The present invention provides an attachment consisting of a bracket secured to and extending outwardly from the door. A padded wheel is mounted to rotate about its vertical axis on the outer end of the bracket, and is arranged for engagement with the body or shoulder to open the door. Owing to the peculiar arrangement of the wheel, there is no danger of the door's swinging back against the waiter before he has passed through.

**INVALID-BEDSTEAD.**—ELMER C. SCRIBNER, Nev-ersink, N. Y. The invention comprehends a novel construction of sectional bottom members having the foot portion formed of two longitudinal frames capable of being raised in unison or independently, and a single crank-operated mechanism, including shifting clutches to move into or out of operative position, whereby either one or both of the foot-frames can be elevated. The longitudinally-tiltable foot-frames are each made of two hinged sections, so that when elevated they may assume an angle shape to accommodate the bending of the invalid's knee.

**CHURN.**—HENRY G. SCHATZ, Commerce, Mo. The churn is provided with a vibrating dasher capable of being regulated to suit different churn-bodies. The dasher-shaft is reciprocated and vibrated by a worm-shaft operated by a handle. An end of the handle is pivoted on one end of a rocking lever, and is adjustable on the lever to shorten or lengthen the stroke of the worm-shaft.

**PROCESS OF MAKING DRY PIGMENTS.**—THOMAS J. O'SULLIVAN, London, Ontario, Canada. This process of producing dry pigment consists in saturating

sawdust with an iron salt, and then drying or burning it. Sawdust being a waste material, it follows that the pigment can be very cheaply made.

**FOLDING BED FOR VEHICLES.**—THOMAS LOTH-ERINGTON, Dallas, Tex. The folding bed is provided with a bottom, and transverse supports for the sides having vertical locking members at their outer ends. Box sides are adapted to rest on the supports and engage the side edges of the bottom and the vertical locking members. Lock bars are removably secured to the sides and adapted to engage the vertical locking members and the underside of the bottom. The vertical locking members and lock-bars have engaging shoulders and lugs. The bed can be quickly and conveniently removed from the running-gear, to permit the bed's being changed from a wagon-box to a tray, or from a coal-car to a flat-car.

**ACETYLENE-GAS LAMP.**—GEORGE W. BAYLEY, Brooklyn, New York city. The lamp comprises an inner and outer casing. The inner casing contains carbide and has a pressure-controlled valve in its bottom for the admission of water. An annular, closed water-reservoir within the outer case is located above the carbide in the holder. A valve in the bottom of the reservoir provides a means for allowing the water to flow into the outer casing before being admitted to the carbide. A vent connects the upper part of the water-reservoir with the gas-space of the lamp.

**SPOUT-GATE AND MECHANISM FOR OPERATING THE SAME.**—HENRY F. KUS, Escanaba, Mich. The invention is more particularly designed for use in connection with inclined spouts for discharging material from a dock into a vessel or from a platform into a car. The gate is mounted to swing vertically between supports at the discharge end of the spout. A locking-frame is mounted to slide in guides on the supports and is connected with the gate, so that when it is raised the gate will be opened.

**WASTE-PIPE PLUG.**—JOSEPH H. LITTLE, Manhattan, New York city. The present invention provides a chainless plug having a link attached thereto converging in a portion of its length and then diverging and having inwardly-turned hooks. In applying the plug, the link will be forced downwardly over a member of the strainer. The hooks will be spread apart so as readily to pass the member of the strainer. When water is to be retained the plug is inserted. When it is desired to draw the water the plug is pulled up until the contracted portion of the link comes above the strainer, the hooks preventing the total detachment of the plug.

**FIRE-ESCAPE.**—CHRISTOPHER PEEL, Manhattan, New York city. An upright ladder on the building is connected with foldable guard-walls above the ladder and adjacent to the windows of the building. The walls each have a foot-board foldable over an aperture thereof and adapted for projection beneath a window when the guard-walls are adjusted outwardly from the building wall.

**BOILER-ATTACHMENT.**—CHARLES W. SOMMER, Aberdeen, Miss. The attachment is especially designed for the collection and removal of sediment. The attachment comprises a pipe-line beneath the boiler, communicating at one end with the steam-space and having a blow-out at the other end. Hollow supports sustain the

pipe-line and establish communication between the lower portion of boiler and pipe-line. A branch communicates with the pipe-line and extends upwardly into the boiler and has openings adjacent to the crown sheets. When sediment is forced through the pipe-line, a suction is created in the supports, so that any sediment remaining in the bottom of the boiler is drawn through into the pipe-line and forced out by the steam.

**GAME.**—WILLIAM A. WISSEMAN, Manhattan, New York city. The game simulates the battle of San Juan Hill and involves a fort or block-house over which a hostile flag is flying, the construction being such that by manipulating a number of balls so that they will enter the block-house, the supposed hostile flag will be automatically caused to disappear and an American flag raised.

**ROTARY BRUSH.**—PETER K. WESTERGAARD, Orangeburg, N. Y. The brush is designed for the use of barbers and stablemen to remove impurities from the hair or scalp. The rotary brush is mounted in a frame and is secured to a vertical standard. On the standard a hand-wheel is journaled by which the brush is turned through the medium of bevel-gears. Beneath the brush a receiver is mounted which collects the impurities removed from the hair or skin.

**HUB FOR VEHICLE-WHEELS.**—CASIMIR C. BAL-LIN, Rue de Chateaudun 5, Paris, France. The invention is chiefly characterized by the interposition between the wheel-nave proper, which carries the spokes of the wheel, and the revolving socket supported on the axle, of an elastic non-metallic pad or cushion, the soft body of which diminishes the force of the jolts. This pad is formed of two series of caoutchouc balls arranged concentrically around the central socket and in the first place tightly packed in a chamber or race. The pad is made in sections for permitting the movements of compression at the moment of the shock to be effected by simple displacement of the elastic material itself and not by rubbing on the walls which inclose it, as is the case with a continuous ring.

**FIRE-ESCAPE.**—JOSÉ DELGADO Y AGUILAR, Brooklyn, New York city. A strong yet simple device has been provided by this inventor for permanent attachment to the outside or inside of a building, which attachment affords a rapid means of escape from burning buildings irrespective of the number of floors. The invention consists of a simple arrangement of a bracket carrying a pulley around which an endless rope runs. At the lower end of the device a controller is provided which regulates the speed of the descent.

**LIGHTING ATTACHMENT FOR VAPOR-LAMPS.**—JAMES A. YARTON, Omaha, Neb. The invention relates to improvements designed for attachment to oil-gas burners of that kind in which a generator is heated by the flame of the burner; and it comprises essentially a carburetor of special construction which is designed to furnish a limited quantity of gas applied to heat the generator to working condition before the ordinary or service generator is brought into use.

**HORSESHOE.**—WILLIAM CAHILL, San Francisco, Cal. The horseshoe is especially designed for use on racing-horses. A light-metal plate is adapted to be attached to the horse's hoof to hold in place an elastic pad,