

RECENTLY PATENTED INVENTIONS.

Electrical Devices.

PORTABLE DYNAMO.—G. A. ALLEN, Western Springs, Ill. By means of this improvement a device may be built of twice the capacity of any former construction without increasing the size of the armature-shaft or length of rack-bar. It reduces to a minimum, if not entirely obviates, all sparking at the brushes and secures a great improvement in smoothness of running. The device is capable of firing more than twice as many fuses as any machine of this type, but is easily transferred from place to place and operated by one man.

CIRCUIT-BREAKER FOR ELECTRICAL CONDUCTORS.—W. G. SHAW, White Plains, Md. In this patent the invention is an improvement in circuit-breakers for electrical conductors, and is particularly designed for use on overhead wires forming parts of a circuit. The sub-shafts are concentric and in alignment and form supports for the circuit making and breaking sections in the operation of the invention.

Of General Interest.

CAR.—F. A. BOOLE and L. D. STEPHENSON, Blaine, Wash. The invention has reference to cars, and especially to those for holding lumber in kilns during process of drying. Its principal objects are to provide such a car in which each piece of lumber will be separated from those adjacent to it by an air-space and which may be readily assembled or disassembled.

CORD OR STRING CUTTER.—A. F. HOFFMAN, Olean, Mo. The cutter comprises a handle having a reverse curve, the two parts of the handle being separated from each other to form a crook, a blade formed integrally with the body of the handle and in general alignment therewith, one edge of the blade being sharpened, and a curved and blunted point extended in general alignment with the blade.

TURPENTINE-BOX.—A. C. McLEOD, Quitman, Ga. The invention comprises a box and a reinforcing-wire having a front portion wired to the upper edge of the front of the box and provided at its ends with rearwardly-projecting portions wired to the upper edges of the opposite ends of the box and extended rearwardly beyond the box to connect with a tree.

PNEUMATIC WATER-LIFT.—W. A. HARRIS and S. H. HARRIS, Greenville, S. C. In the present patent the invention is an improvement in pneumatic water-lifts, and has for its object to provide a novel construction by which the water may be elevated by pneumatic pressure and which may be utilized as a fire-extinguisher when it is desired.

HALF-TONE-PRINTING PLATE.—L. F. SMITH, El Paso, Ill. The object of the inventor is to successfully make half-tone plates without any expensive apparatus. Although for use in half-tone work, line-etching in zinc, brass, or other metals may be made as thin plates and mounted in the same way. The method of connecting the face-plate to the back is applicable to all kinds of printing-plates, engraved or chemically etched, of thin and flexible plates or thick and rigid ones, of a flat surface or a curved plane surface, and a wooden backing or a metal backing.

SHEET-METAL ROOFING.—D. J. WINN, Sumter, S. C. In this instance the invention consists in forming one of the side edges of the sheets with two additional folds arranged to form a return-bend over the ridges, so as to cover and protect the nails and giving a triple thickness of sheet metal over the ridges. The roofing-plates are folded in one piece and compactly nested for mutual protection and economic transportation.

CREOSOTE-TRAP.—E. C. COLE, Chicago, Ill. The invention is an improvement in stoves and ranges, and has for an object the provision of a novel means whereby to catch and retain creosote dropping from the smoke-pipe of a range. An important feature is a pocket or trap formed in the casting of the back flue and all dangers of leakage resulting from defective joints and the like are avoided.

DERRICK.—W. L. ALLAN, San Francisco, and W. T. PRICE, Ithaca, N. Y. The principal object of the invention is to construct a derrick which may be erected without the use of a gin-pole, and which is so formed as to allow of the topmast-sheave being placed close to the top of the mast, thus doing away with certain stresses set up in the mast when the sheave is placed in the usual position and also allowing the mast to be made lighter than heretofore.

AUTOMATIC SHUT-OFF FOR FLUIDS.—E. L. CRIDGE, Passaic, N. J. The improvement relates to valve mechanism, the more particular object being to provide a valve operated and controlled by means of pressure of a fluid passing through said valve, the arrangement being such that when the pressure of the fluid falls below a predetermined limit the valve closes and shuts off further flow of the fluid.

BELT-FASTENER.—P. TESSIER, Horace, N. D. This invention is an improved fastening means for connecting the ends of a power-belt, rendering the connection secure without injury to the normal strength of the material. Among the objects of the invention is to provide a device of this character which can be readily applied or removed when desired and

which will act to hold the ends of the belt with greater security as the tension thereon is increased.

SPEED-INDICATOR.—J. T. F. CONTI, 195, Boulevard Pereire, Paris, France. This apparatus essentially comprises a receptacle having a central capacity connected with an upper lateral tubular or circular chamber and containing a heavy liquid, such as mercury, upon which rests a lighter liquid the level of which will depend upon the deformations of the liquid under the influence of the centrifugal power.

FLUE-CLEANER.—G. C. FRENCH, Chicago, Ill. The invention has reference to flue-cleaners, and has for its object to provide means adapted to readily and completely loosen and remove soot and scale from the inside of a boiler-tube without becoming clogged and consequently rendered more or less inoperative. The operation of the cleaner is continuous.

SEDIMENT-CATCHING POCKET FOR RECEPTACLES.—W. M. GILBERT, Conshohocken, Pa. The invention relates to certain improvements in dispensing-receptacles, and more particularly to means adapted to be inserted within or formed integral therewith whereby any sediment which settles to the bottom of the liquid may be caught and prevented from being dispensed with the main body of the liquid.

GRATE-BAR.—A. L. HOWARD, Vinton, La. The invention is especially useful in connection with devices adapted for the purpose of burning culm, sawdust, and the like. The object is to provide a device inexpensive to manufacture and which presents removable top sections which may be easily replaced from time to time as circumstances require.

FIREPROOF CONSTRUCTION FOR BUILDINGS.—J. JACOBS, Akron, Ohio. In the present patent the purpose of the inventor is the provision of an economic and effective fireproof construction for fire doors, shutters, and partitions, which construction combines lightness with strength and durability and is readily adaptable to any manner of building.

EYE-PROTECTOR.—E. MIROVITCH, 53 Rue Notre Dame de Lorette, Paris, France. The invention comprises eye-glasses or goggles for automobilists or others, having a double ventilating-tube and an extensible bridge-piece, the construction of the bridge comprising two semi-cylindrical stems adapted to work within a screw-threaded nut having right and left handed screw-threads adapted to engage corresponding threads on the ends of the respective stems. It relates to improvements in eye-protectors for which former Letters Patent of America were granted to Mr. Mirovitch.

SANITARY MOUTHPIECE-GUARD.—R. R. MACGILL, Baltimore, Md. The object in this case is to provide a simple and efficient device which will insure the user of the device protection against disease germs, and which permits the application of new disinfectant material for each user of the device without necessitating the removal of the same from the telephone.

SAFETY DEVICE FOR ELEVATORS.—W. LOWRY, Cowley, Alberta, Canada. The invention refers more especially to devices for elevators employed in coal and other mines, although applicable to elevators employed in other places. One of the principal objects is to provide devices of this kind of an embodiment to overcome disadvantages and objections encountered in the use of many other devices of the kind hitherto employed.

CRATE.—R. MORGAN, Ellsworth, Kan. Mr. Morgan's invention is an improvement in crates of the collapsible type. By the peculiar construction of the sides of the crate the said sides may be extended and contracted longitudinally during the folding and opening of the crate, the contraction of the sides permitting inward folding of the sides and ends without interfering with each other.

Hardware.

NUT-LOCK.—J. K. GOURDIN, Pineville, S. C. The invention secures a better spreading of a locking-key into spaces between a nut and bolt in order to lock said key in place when driven home. The key is of soft metal, and pressure applied, it spreads into the spaces in the threads of the bolt and nut and locks them against displacement. Means provide for increasing this locking effect. In compressing the key in the space between nut and bolt a punch may be placed against the outer end of the key when fitted in place and the punch hammered to force the soft-metal key between the bolt and key. A wrench applied with force cuts the soft-metal key and permits removal of the nut.

SNAP-HOOK.—J. C. WELCOME, SR., Burns, Ore. One purpose of the invention is to provide a hook particularly adapted for use in connection with harness, so constructed that all springs are dispensed with and so that even if the snap is closed it will automatically open when a ring or like object is passed to the bill of the hook and whereby the snap will be automatically closed by the entered object when within the bill, but that after the hook is engaged with an object it will not become disengaged until purposely released.

WRENCH.—A. S. MORANGE, Stratford, Conn. The invention is an improvement in wrenches having among other objects to provide a strong and compact adjustable wrench of simple con-

struction in which all of the operating parts are completely inclosed, thereby presenting a neat outward appearance and protecting the adjusting means from the weather.

Heating and Lighting.

FLAME-SPREADER FOR OIL-BURNERS.—J. H. GREENHAGEN, Columbia City, Ore. The invention pertains its improvements in flame-spreaders for all burners used in railroad signal-lamps and the like, its object being to produce a spreader which is economical in the use of oil, and designed to properly spread the flame without causing smoke, and preventing accumulation of dirt in the spreader.

HEATING STOVE.—L. H. THURSTON, Belt, Mont. The improvement is in the nature of a new heating stove, applicable for heating stoves and furnaces of all kinds, and to which is given the name of "oxygen blast." It is designed to secure a more economical use of fuel, a thorough heating of the lower stratum of air in the room, and a perfect ventilation of the room with removal of foul air.

Household Utilities.

PLATE-LIFTER.—C. F. SMITH, New York, N. Y. In this patent the invention is an improved plate-lifter for carrying plates, lids, and other devices about in the kitchen, especially when in heated condition. The invention is primarily directed to a novel construction adapting the lifter to be adjusted with facility to suit plates, pans, etc., of varying diameter.

WINDOW-SHADE AND CURTAIN-SUPPORT.—J. L. SMITH, Eureka Springs, Ark. The object of the inventor is to provide means simple in construction and durable in use adapted to be readily applied to a window-casing and to permit a curtain or shade to be lowered from the top of a window and held adjusted in the desired position, so as to admit air and light from above the top of the curtain and shade and permit of readily cleaning the same.

BEDBUG-TRAP.—J. E. BRUNDIN, New York, N. Y. The device is intended to be employed in connection with a bed or bedding for the purpose of trapping bedbugs and such like insects or vermin. The principal object is to produce a trap which may be easily and quickly applied or set for the uses intended and which may be readily detached and emptied or discharged.

Machines and Mechanical Devices.

APPLIANCE FOR CORD AND ROPE MACHINES.—P. M. STEGMAIER, Plymouth, Mass. The appliance is applied in cord and rope machines for the purpose of smoothing and rendering uniform and compact the lay or twists of the strands of cord or rope as the latter leaves the forming device. It is adapted for all purposes of what are known as "fore-turn-tubes" and "after-turn-tubes," and may be disposed in either horizontal or vertical position, according to the character of the forming or laying devices of the cord or rope machine on which the same may be applied.

ATTACHMENT FOR LINOTYPE-MACHINES.—W. N. BOWMAN, Pierre, S. D. The device consists of a guard adapted to fill an open space at the top of the mold-slide, thus preventing metal from dropping in front of the ejector-blade, the guard end bearing against the periphery of the rim of a mold-wheel, so as to scrape therefrom all type-metal, and a wiper arranged in the path of the mold adapted to oil the walls of the mold-orifice, enabling the slug to be ejected and a perfect "lock-up" to be obtained between the mold and the spout of the melting pot, thereby preventing high slugs caused by metal adhering to the back of the mold.

PAPER-MAKING MACHINE.—W. H. HOFFMAN, Little Falls, N. Y. The invention pertains to cylinder and Fourdrinier machines; and its object is to provide improvements in machines whereby light-weight stock, such as used for making tissue and toilet paper is prevented from sticking and breaking while passing the press-rolls, thus producing a better quality of paper, increasing the capacity of the machine, and reducing waste of stock to a minimum.

CANDY-MACHINE.—Z. S. HOFFMAN, Newark, N. J. In this instance the improvements are in candy-machines of the type operating centrifugally to force out the melted sugar or other candy material in shreds or of a floss-like nature, the main object being to so construct the candy-head that the outlet may be readily adjusted as to size, thus providing for various sizes of shreds.

Railways and Their Accessories.

SLEEPER AND CONNECTION FOR RAILWAYS.—R. H. IRELAND, Newark, N. J. Among the objects in this invention is the provision for the securing of the rails without the use of spikes or like fastening devices and enabling the rails and sleepers to be assembled expeditiously without the necessity of gaging the distance between the rails, which is fixed and determined in the manufacture of the sleeper.

AUTOMATIC AND STEAM PIPE COUPLING.—W. F. THORNTON, JR., Germantown, Pa. An object of the inventor is to simplify the construction of this device, making it positive and perfect in action even when the coupling of the cars takes place under the most unfavorable

circumstances, as when brought together on sharp curves or when the couplers of the cars stand at different heights; further, to provide for the connecting of the air and steam pipes of one of the improved automatic couplers with such pipes of an adjacent car when the latter is not thus provided.

RAIL-JOINT.—A. E. SPRATLEY, Monett, Mo. Among other objects in this case is to dispense with the use of bolts and other devices for positively connecting the rail ends together, and thereby admitting of the rails expanding independently of each other. The construction is such that the strength of the joint is materially increased and the ends of the rails supported in a way to prevent the constant pounding of the train-wheels depressing them at this point.

Pertaining to Recreation.

BAIT TRAP AND HOLDER.—V. LE BEAU, New Orleans, La. The object in this improvement is to provide means for storing food adapted to attract minnows, to hold the food compactly and in good condition so as not to be affected by the currents or when raising the trap out of the water, and also to provide means whereby the live bait is permitted to readily enter the trap and be retained.

Pertaining to Vehicles.

VEHICLE.—O. J. WIDMEIER, Sigel, Ill. In driving on country roads where they are bad it is inconvenient for a single-horse team to pass along by reason of the fact that most vehicles which pass are double-horse teams. Horses of the double teams wear two paths in the roadway, and the intermediate space becomes very rough, upon which space the horse, if it were a one-horse vehicle, must pass. The object is to provide a vehicle which will overcome this objection.

BOW-REST FOR VEHICLE.—J. H. SPRAGUE, Norwalk, Ohio. The invention relates to improvements in folding tops for automobiles and other vehicles, and more particularly to means for spacing the bows of said tops and holding them in definite position in relation to each other when the top is folded back, said means being so constructed that all chafing and wearing of the bows or cover is prevented. The bow-rests are so constructed as to prevent all rattling or jarring of adjacent parts.

AUTO SNOW-CAR.—J. SHERWOOD, Lake, Idaho. In carrying out his invention, Mr. Sherwood provides a main frame mounted on runners and carrying a suitable motor, together with a propeller connected with the said main frame and arranged to be operated by the motor mechanism on the main frame to advance the car, and also to be heated from the said motor mechanism, whereby to keep the surface of the propeller clear of accumulations of snow, so it will be in operative condition at all times when desired.

NOTE.—Copies of any of these patents will be furnished by Munn & Co. for ten cents each. Please state the name of the patentee, title of the invention, and date of this paper.



HINTS TO CORRESPONDENTS.

Names and Address must accompany all letters or no attention will be paid thereto. This is for our information and not for publication. References to former articles or answers should give date of paper and page or number of question. Inquiries not answered in reasonable time should be repeated; correspondents will bear in mind that some answers require not a little research, and, though we endeavor to reply to all either by letter or in this department, each must take his turn. Buyers wishing to purchase any article not advertised in our columns will be furnished with addresses of houses manufacturing or carrying the same. Special Written Information on matters of personal rather than general interest cannot be expected without remuneration. Scientific American Supplements referred to may be had at the office. Price 10 cents each. Books referred to promptly supplied on receipt of price. Minerals sent for examination should be distinctly marked or labeled.

(10410) A. C. M. asks: I am told that some ten years ago a method was described in the SCIENTIFIC AMERICAN by which a man can obtain power by looking at some particular part of his face through the mirror. This power enables him to get rid of his own diseases and to cure certain diseases in other persons by a method called suggestive treatment. This treatment, I am told, is also called biology or telepathy. The particular part of the face referred to has been pointed out to me, but I want to have full information on the subject, and shall be very glad to obtain, if possible, spare copies of the SCIENTIFIC AMERICAN which contained the suggestions referred to above, or any books dealing with the subject of obtaining power by this or any other means. I shall also feel very much obliged if you would kindly let me know the names and addresses of the persons practicing this treatment, to whom I may refer for the solution of my difficulties. A. We have no information regarding a method of curing diseases by looking at ourselves in a mirror. We wish it were in our power to do so. It would be vastly easier than to take medicine.

But we shall stick to the old way for the present. We do not think this method of treating disease is described in any scientific work.

(10411) J. W. asks: If you have a book that tells how the distance from the earth to the sun is ascertained, let me know. Could you give me the formula in trigonometry for finding the side distance or hours of the sun dial? A. The distance of the earth from the sun was ascertained first by astronomers by observations upon the transit of Venus. The solar parallax will give the result if it can be found with sufficient accuracy. The best method for finding it is by measuring the velocity of light, which multiplied by 499 gives the distance of the earth from the sun. You will find most of these processes given in text-books of astronomy. We can send Moulton's for \$1.50, and Young's "General Astronomy" for \$3. The formula for a sun dial which employs a horizontal surface upon which to cast the shadow of a style, or plate, is tang. angle with north and south line equals tang. 15 deg. times sin. lat. for 1 P. M. and 11 A. M. tang. angle for 2 hrs. 10 A. M. and 2 P. M. equals tang. 30 deg. times sin. lat. and so forth till the angle for the longest day in summer at your place is reached.

(10412) S. B. M. asks: Will you kindly settle the following arguments? Practically the same principle is involved in all three, and of course the velocity of the cannon ball in the first is absurdly small, but that is granted for the sake of argument. I. A train is running eastward at a speed of 100 miles an hour. Mounted on the front of this train is a cannon. From the cannon is fired a projectile with a velocity of one hundred miles an hour westward: i. e., in a direction opposite to the motion of the train: A holds: 1. That the projectile will move over the top of the train with a velocity of 100 miles an hour. 2. That its velocity with regard to the ground is nil; i. e., through space it has no velocity. 3. That a rifle ball will reach the ground in just as short a length of time when fired at a high velocity as if it were dropped from the muzzle of the gun with no lateral velocity, granted of course that the ground is level and the bore of the gun is parallel to the ground. B holds: 1. That the projectile will move over the top of the train at the rate of 200 miles an hour. 2. That with regard to the ground it has a velocity of 100 miles an hour westward. 3. That this is not true. A. In your various propositions regarding relative motion, the one whom you designate as A is right and B is wrong. Such problems are applications of Newton's Three Laws of Motion, or rather of the first and second laws. These laws are to be found in all school textbooks of physics. The cannon mounted upon the train which is running 100 miles an hour is carried eastward by the train with a velocity of 100 miles an hour, and sends its projectile westward with a velocity of 100 miles an hour. It should be plain that a ball which moves east and at the same time west with the same velocity will be at rest with reference to the earth below it. The train moves away under it. The ball would drop vertically upon the roof of the train, or upon the earth below from the muzzle of the gun, if the train could run from under it before it had time to fall upon the roof. The rifle ball shot horizontally will fall toward the ground as really and with the same velocity as if it were dropped vertically. See Newton's Second Law. Gravitation produces its effect, whether it acts at the same time with other forces or acts alone. This is the reason why a ball which is projected upward returns to the earth again. All objects not supported fall toward the center of the earth in exactly the same manner, since gravity produces its effect upon all alike. It matters not how they are moving under the action of other forces. II. An elevator falls down a shaft at the rate of 50 feet per minute; a man drops after it at the rate of 60 feet per minute. A holds that the man will strike the elevator with the same force as if the elevator were stationary and he were dropping 10 feet per minute. B holds that he will strike it with less force. A. A man who strikes an elevator which is moving 10 feet per minute slower than he moves will strike it with a velocity of 10 feet per minute, and give a blow proportional to his weight and his velocity. III. The same thing as II. (a) A train is moving at the rate of 30 miles an hour; on the same track a train is following at 40 miles an hour; (b) they are moving at the same speeds on parallel tracks. A holds that (a) the second train will strike the first with the same velocity or force as though the first were standing still and the second struck it going at the rate of 10 miles an hour; (b) that the second train will pass the first at the rate of 10 miles an hour—will take as long to pass it as though it were standing still and the second going at 10 miles an hour. B holds (a) that the second train will strike with less force and (b) that it will take longer to pass the first train. A. The swifter train will pass the slower train as if it were standing still and the swifter had a velocity equal to 10 miles per hour, the difference of the two velocities. All these answers are based upon the supposition that the resistance of the air is excluded from the problem, as is usually done in such cases. This is not necessary, however, in these answers, since it is stated in the questions that a certain definite velocity is attained, the resistance of the air being one of the elements in attaining the velocity.

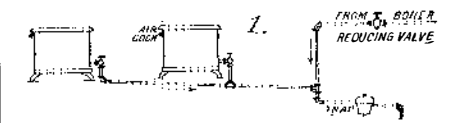
(10413) H. F. says: Concerning the earthquake reported, was the recent disturbance in Kingston predicted by reliable scientists, and can such disturbances be prognosticated to any degree of accuracy? A. Earthquakes have not been successfully predicted, nor does it seem probable that they ever can be predicted.

(10414) J. W. K. says: I hereby take the liberty of asking you to settle an argument. I claim pure distilled water is a non-conductor of electricity, B claims it is a good conductor. Which is the best insulator of the following—glass, pure water, oil, rubber, wood (dry), shellac, and in what order do they stand? What would the resistance of a column of pure water be if the column were 1-16 inch in diameter and 10 feet long, also the same column of silver? Please state the resistance in ohms. A. If the conductivity of annealed copper is taken as 100, the conductivity of annealed silver is 105, and of hard-drawn silver is 98.1. On the same scale the conductivity of pure water is less than one-millionth (0.000001) and that of glass less than one-billionth (0.00000001). Pure water is classed with insulators, but pure water does not exist in nature. The resistance of a silver wire, annealed, 0.001 inch in diameter and 1 foot long, at the freezing point of water, is 8.781 ohms; and that of the same wire hard drawn, under the same conditions, is 9.538 ohms. From these figures you can calculate the resistance of the wire you wish to use. The resistance of the column of pure water of same size and under the same conditions would be less than one-millionth as much. We leave the calculations to you. The order of the insulators about which you inquire as given by Foster in his "Pocket Book" is pure water, olive oil, paraffine oil, glass, gutta percha, shellac. We can send you the book for \$5.

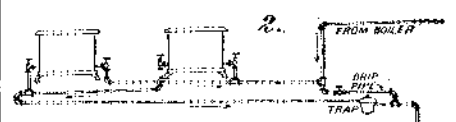
(10415) A. O. S. says: What is your idea, or the idea of scientific men of to-day, as to the condition of the ultra space as regards temperature? In other words, if a thermometer were placed far and away beyond the effects of gravitation and radiation of the entire stellar universe or ultra space, what would it register? Would it be what we call absolute zero, or in other words total absence of heat, and if so, why? A. It is the opinion of scientists that the temperature of space is absolute zero. The simple reason for this is that there is nothing there to intercept the waves of radiant energy and thus transform them into heat.

(10416) Several valued correspondents have written us, calling attention to the error of omission on the part of the types in an answer to Query 10342. Not all of the criticisms were kind, some were unjust, and some as erroneous at least as the original incomplete answer. In another note we have completed the answer as it should have appeared in the original issue, and have said all it seems necessary to say about it. We may now, however, point out the curious failure in argument by several in reasoning that whatever would be true of two balls of metal falling a short distance in air would also be true for any distance and for balls of any materials whatever. They argue even to the case of lead and hydrogen, in which of course a most absurd conclusion would result. Lead is not far from 9,000 times as heavy bulk for bulk as air, and aluminum is about 2,000 times as heavy as air. These in a fall of a moderate distance will fall equally fast. As we have before stated, the fall will not differ appreciably for distances up to 100 feet or more. We have not experimented on this matter, but take the statements of good authorities. Galileo experimented with 1-pound and 10-pound balls of lead and dropped them from the Leaning Tower of Pisa, height 179 feet, and found that they fell practically together. A lead ball weighs four times as much as an aluminum ball of same size. This difference is small as compared with the difference between these weights and that of the displaced air. For low velocities such as are acquired in a fall of 100 feet these two balls will be about equally able to overcome the resistance of the air, and will doubtless reach the ground very nearly together.

(10417) L. H. P. writes: Referring to the question asked by H. W. S., No. 10192, in your paper of November 10, 1906, page 351: Neither system of radiator connections will work at 80 pounds pressure. The diagram No. 1 would work at a reduced pressure, say 5 pounds, provided the pipe was of the proper size, and the trap connected with the down pipe thus:



Your diagram No. 2 will not work, as the return of the first radiator will stop the circulation of the second. It should be run thus:



In this arrangement no air valves are required if any ordinary Nason or pot trap is used. In both diagrams shown by you, the air valves are at the wrong end of the radiators. A. We thank you for calling our attention to an-

other way of arranging the piping of the radiators. Both systems, as you describe them, would, we believe, work satisfactorily. Both systems shown in our sketches would work at 80 pounds pressure if the piping were of proper size and properly pitched. We understand, of course, that a much lower pressure, say 5 pounds, would be much preferable, but that was not the pressure which was specified in the letter we were answering. We therefore did not refer to it. The location of the air valve depends on the character of the radiator. On most of the common radiators the air valves are located as you indicate them.

(10418) J. G. T., Cincinnati, Ohio, is informed that if he sends his name his queries can be answered. See first notice in Query column each week.

(10419) M. W. P. writes: Our teacher has taken the position that a circle is a polygon. I would be pleased to have your opinion on the matter and also a demonstration in proof, for she will not receive any proof that I have been able to find. A. We are not able to tell from your letter whether you agree with your teacher that a circle is a polygon or not. If you do not agree with her we are sorry for you, since she is entirely right. Every mathematical student of any advancement knows that the circle is regarded by all mathematicians as a polygon of an infinite number of sides. The fact that a polygon may be inscribed in a circle and another may be circumscribed about the same circle which shall differ from the circle by less than any assignable quantity is proof of the point in question.

(10420) L. T. F. asks: As a reader of your paper for thirty-five years I would ask you to give the following information through your journal. This morning, about 5 A. M., we discovered smoke in our house. After investigating I found a bunch of rags on fire on a shelf. It was a glowing mass of fire about the size of a coconut, but no blaze. I found on further investigating that this rag had been saturated with furniture polish during the previous day, composed of linseed oil, turpentine, and varnish. I would like to know if it is possible for spontaneous combustion to take place on an open shelf in twelve hours' time? If so, there is a new danger for fire not thought of by the average housekeeper. A rag saturated with a mixture such as you describe is a very dangerous thing to leave lying around the house. The average housekeeper should not run such a risk of a fire. Many cases like this occur every year.

(10421) D. D. A. asks: 1. How can I make dry batteries? That is, what shall I fill them with? A. Dry cells are filled with a solution of ammonium chloride in water. Other materials are added to make a suitable paste. The carbons are packed with manganese dioxide and graphite. The process is given in our SUPPLEMENTS Nos. 1383 and 1387, price ten cents each, much more fully than can be given in a letter. 2. I have a small electric motor; the armature has three poles, the brushes are flat copper. Can I change it into a dynamo? Please give directions for doing so, if possible. A. Many small motors will not generate as dynamos, since they cannot build up a field of sufficient strength. You can find out about yours by trying it. Should you not succeed, you can then disconnect the field wires and use a battery in the field circuit to magnetize the field. It will then be separately excited, and will generate a current.

(10422) L. M. F. asks: I have a ground circuit telegraph line one-half mile long; two 20-ohm instruments on line. At one end have two 5 x 7 and one 6 x 8, at the other end one 5 x 7 and one 6 x 8 gravity batteries. Have glass insulators for line wire; do not know if line wire is steel or iron. Batteries will not work line, will work on short circuit. Have batteries connected, the positive pole to the negative pole of the other; also have them connected from one end of line to the other in like manner. I have worked line with an addition (to the present batteries) of twelve dry cells. I have a bell which one dry cell will ring, my gravity batteries will not. I have the copper covered with blue vitriol. The crowfeet are covered with a black substance. Batteries have been charged for two weeks. Are my batteries weak? Is my line the fault to a certain extent? How many gravity batteries will it take to run this line with 20-ohm instruments when line is in working order? A. Your trouble with the telegraph line may be due to one or more of several causes. The joints of the wires of the line may not be good. The ground connections may be bad. The battery may not be connected in series at the two ends, so that one part of the battery opposes the other part. The battery may not be powerful enough for a good line, and if there is any fault in the line the battery will of course not be powerful enough for a poor line. It is not possible for us to tell which of these causes is the source of your trouble. One dry cell may ring a bell when a far better gravity cell will not. The dry cell has 1.5 volts, and the gravity cell has only 1 volt at its best. But the gravity cell with its 1 volt will work right along for months on a telegraph line, while the dry cell will be run out in a short time. The black, or rather brown, dirt on the gravity zincs does not diminish to any extent the force of the cell. It is well enough to take the zincs out and scrape off once in a while. If you can find no other fault in your line, you would do well to put on more cells.

INDEX OF INVENTIONS

For which Letters Patent of the United States were Issued for the Week Ending February 26, 1907.

AND EACH BEARING THAT DATE

[See note at end of list about copies of these patents.]

Adding machine, J. Swart.....	845,276
Advertising device, W. E. Owen.....	845,704
Air blast drier, J. Beerink.....	845,047
Air brake apparatus, R. J. Wilson.....	845,500
Air cleaning apparatus, dust-laden, A. Lotz	845,364
Air compressor and the like, De Laval &	
Aborn	845,653
Air currents, apparatus for separating dust	
from dust-laden, A. Lotz.....	845,562
Air currents, separating solid material held	
in suspension by, A. Lotz.....	845,563
Air ship, J. A. Elston.....	845,539
Annealing box, M. F. Jarrett.....	845,093
Antbraquinone compounds, preparing,	
Scholl & Kanz.....	845,129
Automatic brake, J. W. Gurnsey.....	845,412
Automatic gate, G. C. Mason.....	845,308
Automobiles, gas lighter for, Kapp & Al-	
viset	845,553
Axle, H. K. Bryson.....	845,516
Bag, trunk, or similar article, W. J. Teese	
.....	845,145
Baling machine, J. J. Huggins.....	845,356
Baling press, C. E. Field.....	845,625
Battery plate, storage, J. Bijur.....	845,048
Bearing, ball, F. W. Gurney.....	845,632
Bed and table, combination, E. Peters.....	845,117
Bed attachment, C. E. Cass.....	845,523
Bed, extension, W. L. Edwards.....	845,223
Binder, loose leaf, Baughman & Mead.....	845,390
Bit. See Drill bit.	
Block signal system, F. B. Corey.....	845,220
Boat, life, G. O. Ditton.....	845,620
Boat releasing device, H. G. Oliver.....	845,477
Bobbin, G. Popplewell.....	845,575
Boiler tube cleaner, R. Herman.....	845,083
Bookbinders, signature gathering machine	
attachment for, J. Murray.....	845,369
Boring machine, A. Y. Pearl.....	845,191
Boring tool, recess, M. Jungling.....	845,360
Bottle, A. W. Hutchins.....	845,175
Bottle attachment, W. J. Gesell.....	845,347
Bottle, dropping, R. H. Ferguson.....	845,409
Bottle neck forming machine, J. C. Hender-	
son	845,235
Bottle, non-refillable, R. Gattl.....	845,541
Bottle, non-refillable, H. N. Rothweiler.....	845,570
Bottle stopper, G. Kirkegaard.....	845,646
Bottles, valve for non-refillable, W. T. Sol-	
omon	845,136
Box, J. H. Thielert.....	845,596
Box covering blank, J. S. Stokes.....	845,205
Boxes from pasteboard or the like, machine	
for manufacturing, F. Fetzback.....	845,071
Brake shoe adjuster, J. S. Ashworth.....	845,504
Brake system, fluid pressure, M. W. Hib-	
bard	845,353
Braking and locking device, combined, E.	
Peducasse	845,192
Brick or like molding machine, plastic, J.	
W. Bottomley	845,329
Brick press, P. Thomann.....	845,146
Briquet machine feeder, K. P. Hangl.....	845,290
Brush, J. F. Gohl.....	845,408
Brush, dustless, F. D. Wolfgram.....	845,387
Brush, tooth, F. P. Drowne.....	845,064
Buckle, O. C. Dally.....	845,164
Buckle, D. A. Huffman.....	845,642
Building, earthquake proof, J. Eechold.....	845,046
Burglar alarm, J. Gaynor.....	845,629
Butchers' block meat clamp, J. E. Keller	
.....	845,263
Butter cutter, Macnish & Penn.....	845,468
Cabinet, L. W. Randolph.....	845,707
Cabinet, L. W. Dickinson.....	845,728
Cap feeding machine, J. A. Hicks.....	845,415
Car controlling apparatus, C. W. Coleman.....	845,161
Car door, J. A. & J. A. Bourgeois.....	845,509
Car fender, W. T. McLaughlin.....	845,110
Car fender, automatic, W. H. Walsh.....	845,442
Car motor, E. Edwell.....	845,682
Car roof, S. Herbert.....	845,414
Car underframe, Howard & Dunn.....	845,089
Car vestibule diaphragm, J. H. Donaldson.....	845,451
Car wheel press, Cullen & Reiss.....	845,397
Cars, automatic air brake coupling for rail-	
way, F. H. Rutherford.....	845,265
Cars, folding stake for railway, J. W. Ken-	
drick	845,097
Carbon tetrachloride preparation and its	
production, J. Stockhausen.....	845,322
Carbons for arc lamps, utilizing waste	
ends of, R. Peters.....	845,256
Carpenter's bench, H. A. Brunstrom.....	845,688
Carriage machine, J. W. Crain.....	845,697
Cartridge holder, Burnett & Eubear.....	845,611
Case. See Show case.	
Cash check till, R. Field.....	845,342
Cash register, H. S. Hallwood.....	845,634
Casting spaces and quads, matrix for, F.	
H. Brown et al.	845,685
Castings, mold for making metal, F. H.	
Sweet, Jr.	845,668
Ceiling or floor plate, J. J. Sullivan.....	845,142
Cellulose, obtaining, F. L. Stewart.....	845,378
Cement brick making machine, H. Pocock.....	845,194
Cement mold, S. T. Buckland.....	845,610
Chair attachment, M. L. David.....	845,222
Chalk lines, automatic chalker and reel for,	
S. S. Field	845,401
Charging apparatus, T. F. & J. G. With-	
erbe	845,601
Cheese vat, F. J. Macnish.....	845,470
Churn, Gentry & Bottomlee.....	845,346
Churn, C. L. Cook.....	845,527
Churn motor, E. W. Cole.....	845,525
Churn operating mechanism, A. H. Stutler	
.....	845,595
Cigar box, Moon & Cushman.....	845,528
Cigar cutter, J. C. F. Dick.....	845,536
Cigar stand, cigar cutter, match box, and	
lighter, combined, J. E. Zorn.....	845,325
Circuit breaker, automatic, H. W. Leonard.....	845,655
Clam and oyster opening machine, L. H.	
Carlson	845,521
Clock, J. Fellheimer.....	845,070
Clock, calendar, J. L. Woods.....	845,603
Clothes drier, W. S. Morgan.....	845,248
Clothes drier, J. Curry.....	845,398
Clothes line pulley, R. Alpin.....	845,388
Clothes line support, E. H. Muse.....	845,702
Clothes rack, W. S. Mathers.....	845,245
Clutch, H. Jexler.....	845,094
Clutch, magnetic, A. W. Saville.....	845,126
Coal and other minerals, means for loading	
and unloading, C. Burnett.....	845,217
Coating machine, A. J. Ford.....	845,734
Coin collector, McBERTY & McQuarrie.....	845,370
Coin collectors, circuit for, J. L. McQuarrie	
.....	845,111
Coin collectors, circuit for, McQuarrie &	
Crane	845,112
Coin holder, M. Quinn.....	845,664
Coke oven charging apparatus, F. W. C.	
Schniewind	845,719
Column, metal, T. H. Gillespie.....	845,350
Compressor, rotary, C. C. Palmer.....	845,114
Concrete floor contractor, F. A. Koettitz.....	845,465
Concrete, mold for imbedding tablets in, T.	
J. Missildine	845,311
Concrete steel construction, P. Kuhne.....	845,554
Conductor pipe machine, S. M. Schmelzler.....	845,437
Confection baking apparatus, Lanier &	
Driesbach	845,557
Connecting pin, J. R. Reniff.....	845,121
Controller, Cooper & Johnson.....	845,528
Conveyer aron, E. Schaffner.....	845,269
Copper, hardening, R. T. Anderson.....	845,606
Copying machine, D. T. Marshall.....	845,730
Cork puller, H. Bitner.....	845,608
Corn cutter, A. C. Robey.....	845,123