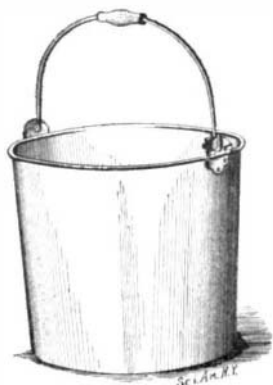




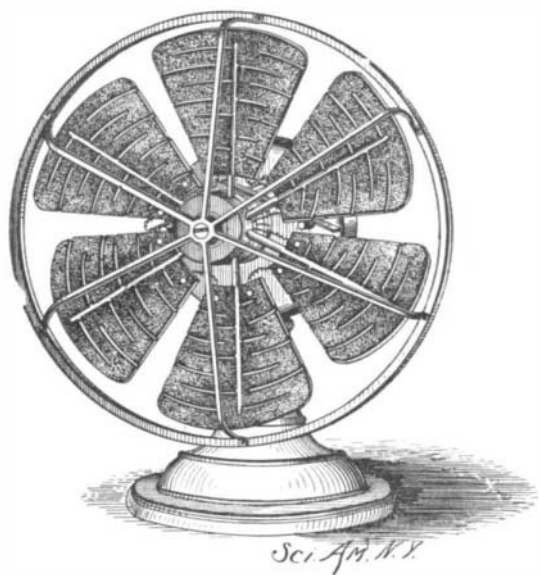
ODD CONTRIVANCES.

BAIL SUPPORTER.—A kettle bail that will never stand in the position in which it is placed, is one of the petty annoyances to which every housewife is subjected. A Western inventor, Mr. Silas Baker, of Pawpaw, Ill., intends to do away with this old annoyance by means of a simple little device which is intended to hold the bail in such a position that it cannot rest against the kettle. To the ears of the kettle a semicircular piece of metal is secured, having a hole near its center and a flange on its circular edge. A series of notches in the edge of the flange engage and hold the wire bail. Lugs are employed to attach the semicircular piece of metal to the ears of the kettle.



ADJUSTABLE BAIL SUPPORTER.

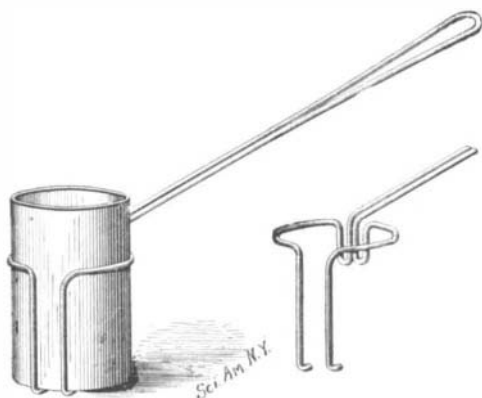
ELECTRIC HEATER.—A Boston inventor has conceived the idea of using a fan motor so that hot air can be supplied. He makes the blades of his fan of carbon, which has both the required mechanical strength for moving the air and also the electrical qualities necessary to form a heating resistance. The current is passed directly to the blades, dispensing with the complicated intermediate devices which have been heretofore employed. The invention avoids the use of blades supporting the usual resistance wires on insulating pins, skeleton frames supporting wire



ELECTRICAL FAN AND CARBON HEATER.

gauze which forms a heating resistance and other forms, comprising a resistance and a blade-supporting the resistance. In this device the blade which fans the air is itself the electrical heating resistance, and that seems to be a novel feature.

DIPPER-HANDLE.—A convenient form of handle for dippers, cans and other vessels, which can be as readily attached as it can be removed, is illustrated in the annexed engraving. The handle is made of a single piece of wire, so bent as to provide a support for the bottom, and to embrace the vessel. Our illustration



REMOVABLE DIPPER-HANDLE.

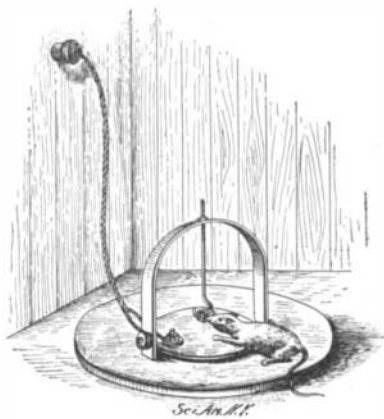
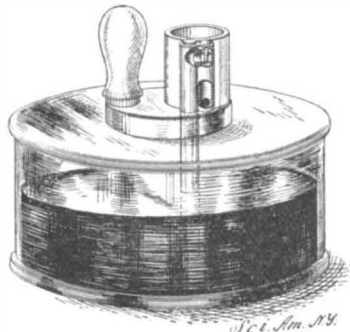
tion so clearly shows the peculiar construction of the handle that an extended description is not necessary.

SIPHON INKWELL.—In order to prevent the exposure and consequent evaporation of ink, inkwells have been devised consisting of a large ink reservoir from which ink is supplied to a small dip-well. The ink is usually

forced from the reservoir into the dip-well through a supply opening. As a result the ink is exposed, evaporates, and leaves a fixed deposit which not only renders the well unfit for use, but frequently clogs the supply opening and prevents the replenishing of the dip-well. The improved inkwell pictured is free from this defect. A siphon has its long leg extended into the reservoir and its short leg in communication with the bottom of the well. A port pierces the wall of the well above its bottom and communicates with the siphon at a point between its ends. A valve controls the port in order to complete the siphon and empty the well, or to break the siphon and establish communication with the well at an elevated point for the return fluid. By means of a rubber bulb air is forced into the reservoir above the ink, so that the ink, being subjected to pressure, will pass through the siphon and will escape into the well through the port. In order to retain the ink within the dip-well after releasing the bulb, an overflow port is provided piercing the short leg of the siphon and the wall of the dip-well at a distance to permit the retention of a proper amount of ink in the dip-well.

ELECTRICAL TRAP.—An inventor has conceived the idea of killing mice and rats by electricity, and has to that end devised an electrocuting-trap. The base of the trap is a conductor of electricity. Upon this base a conducting platform is placed, separated from the base by an insulating material. An arched bait-holder is electrically connected with the base. Wires leading from any convenient source of electricity are connected with the base and the superposed platform in open circuit. When the rat leaps upon the platform and snatches the bait, the circuit is closed and the entire current passes through its body.

BALL-BEARING WHEEL.—A ball-bearing wheel is a novelty for which Frederick P. Vaughan, of Perry, Oklahoma Territory, recently secured a United States patent. The wheel consists essentially of an inner portion provided with an inner bearing ring, and an outer bearing ring forming the tread of the wheel. The outer bearing ring is provided with sides interlocked with the inner portion of the wheel. The inner and outer bearing rings form a race-way for balls. The inventor states that the wheel reduces the friction to a minimum and is capable of sustaining heavy loads. Water is effectually excluded from the interior of the rim by reason of the peculiar construction of the interlocked inner and outer rings.



ELECTRICAL MOUSE-TRAP.



A BALL-BEARING WHEEL.

Electric Burglars' Tools.

Sometimes we must turn to European papers to find out what our enterprising, inventive burglars have been doing in the way of devising more efficient means of "cracking safes." It seems that some time ago a burglar was caught in New York upon whose person a small electric lamp of the cylindrical type was found. The New York sensational journals naturally dilated upon the use of the electric light instead of the time-honored dark lantern. The London Daily Mail seized this story with avidity, and enlarged upon it until it finally assumed the following shape: "The New York police to-day arrested two thieves who had

been committing extensive burglaries in wealthy suburban districts. One burglar carried an electric bludgeon operated by a storage battery and capable of shocking and stunning a person. He also had an electric saw and jimmy for opening safes. His companion carried an electric lamp instead of the old-fashioned oil-lantern. The two burglars were well-dressed and had good manners. They are said to be skillful mechanics. The police say that the electric bludgeon is one of the most dangerous weapons ever seen."

Tesla's Recent Patents.

Nikola Tesla has received several patents for a "Method of Intensifying and Utilizing Effects Transmitted Through Natural Media." In one of his systems Tesla varies the potential point or region of the earth by imparting to it intermittent or alternating electrifications through one of the terminals of a suitable source of electrical disturbances which, to heighten the effect, has its other terminal connected with an insulated body, preferably of large surface and at an elevation. Electrifications communicated to the earth spread in all directions, reaching a circuit which generally has its terminals arranged and connected similarly to those of the transmitting source, and which operates upon a highly sensitive receiver. Another of Tesla's methods is based upon the fact that the atmospheric air, which behaves as an excellent insulator to currents generated by ordinary apparatus, becomes a conductor under the influence of currents or impulses of enormously high electromotive force. By such means air strata, which are easily accessible, are rendered available for the production of many desired effects at distances. Although either method may be employed, it is obviously desirable that the disturbance should be as powerful as possible and should be transmitted with a minimum loss. The loss reduces greatly both the intensity and the number of the co-operative impulses, and since the initial intensity of each of these is necessarily limited, only an insignificant amount of energy is thus available for a single operation of the receiver. Furthermore, the energy obtained through the co-operation of the impulses is in the form of an extremely rapid vibration and unsuitable for the operation of ordinary receivers. To overcome these limitations of the two methods mentioned, Tesla reproduces arbitrarily varied or intermittent disturbances or effects; transmits these disturbances through the air to a distant receiving station; utilizes the energy derived from such disturbances at the receiving station to charge a condenser; and uses the accumulated potential so obtained to operate a receiving device.

The apparatus which is employed at the receiving station consists in the combination of a storage device included in a circuit; connection points at a distance from the source of the disturbances and between which a difference of potential is created by such disturbances; a receiving circuit connected with the storage device; a receiver included in the receiving circuit, and a mechanism for closing the receiving circuit at any desired moment, thereby causing the receiver to be operated by the energy with which the storage device has been charged.

In another method the energy stored is not, as in the preceding instance, obtained from the energy of the disturbance effect transmitted from a distance, but from an independent source. The method in general consists in charging a storage device with energy from an independent source, controlling the charge of the device by the action of the effects or disturbances transmitted through the natural media, and coincidentally using the stored energy for operating a receiver. A condenser is used as the storage means.

The invisible radiations of the spectrum and of vacuum tubes are generally considered to be vibrations of extremely small wave length. These radiations possess the property of charging and discharging conductors of electricity, the discharge being particularly noticeable when the conductor upon which the rays impinge is negatively electrified. It is usually held that these radiations ionize or render conducting the atmosphere through which they are propagated. Tesla's own experiments lead him, however, to conclusions more in accord with the theory he has already advanced, in which he holds that sources of such radiant energy throw off with great velocity minute particles of matter which are strongly electrified, and therefore capable of charging an electrical conductor, or, even if not so, of discharging an electrified conductor either by carrying off bodily its charge or otherwise. Tesla has taken out a patent based upon a discovery which he has made, that when rays or radiations of this kind are permitted to fall upon an insulated conducting body connected with one of the terminals of a condenser, while the other terminal is made by independent means to receive or carry away electricity, a current flows into the condenser so long as the insulated body is exposed to the rays. Under certain conditions an indefinite ac-

accumulation of electrical energy takes place. This energy after a suitable time interval, during which the rays are allowed to act, may manifest itself in a powerful discharge, which can be utilized for the operation or control of mechanical or electrical devices or rendered useful in many other ways. The radiant energy is directed upon an elevated conductor, connected with one of the armatures of the condenser, positively electrified by the invisible radiations. The electricity is carried off from the other armature by connecting it with the ground. The accumulated energy is discharged through a suitable receiver.

Recent Improvements in the Nernst Lamp.

Several patents have recently been issued in the United States to Walther Nernst, Henry N. Potter, and Marshall W. Hanks, for processes and devices designed to overcome various defects which have been noticeable in the Nernst lamp.

Mr. Potter intends to use several spirals of wire to effect the heating of a single glower, or a number of glowers. A single spiral suffices to heat small glowers with sufficient uniformity, but when glowers of large-current capacity are to be started up, the heat must be very evenly distributed to prevent cracking of the glower. Instead of increasing the diameter and length of wire of a small heater, which is rather costly, Mr. Potter finds it cheaper to multiply heaters in parallel. Several heaters equal in surface to a single large heater, he finds, will heat up more quickly, as they have but a fraction of the mass of the large one. Several heaters can be so distributed about a glower that their combined effects heat much more evenly than a single spiral practically can.

The quality possessed by the glowers of acquiring an increased conductivity under the influence of heat has been counterbalanced by the employment of ballast-conductors placed in series with the glowers. But in the practical manufacture of standardized ballast and of glowers having uniform qualities under the conditions of practical use, it is sometimes found that an additional adjustment of the ballast is needed in order to secure perfect working. It is sometimes desirable to employ a ballast inclosed in an air-tight chamber, or so to construct the principal portion of the ballast that it is not readily adjustable. Mr. Nernst has devised a divided ballast, a portion of which is standardized as perfectly as possible, while the remainder is adjusted according to the peculiar conditions of each glower. By the employment of the divided ballast it is possible to compensate for any imperfection in the standardized ballast or in the glower, or both.

Mr. Nernst has likewise invented four compositions for glowers. These compositions consist essentially of the oxide of zirconium mixed with earths of the yttrium or cerium groups.

An effective and easily practised method for treating Nernst lamp glowers whereby they may be adapted to circuits of a given voltage, is the subject of the patent granted to Mr. Hanks. The adaptability

intended, with coatings of material, the composition of which is the same as that of the glower body itself. Assuming that the glowers to be treated are actually adapted for higher voltages than those for which they are desired, Mr. Hanks subjects them in a heated condition to a cloud of powdered material which is the same as that of the glower body itself. If the glower is treated while hot and is rotated during treatment, the powder will be deposited in a uniform layer. The treatment is continued until a voltmeter, connected across the circuit from which the energy for heating the glower is derived, indicates that the desired increase in cross-section has been obtained.

THREE NEW ELECTRICAL DEVICES.

The matter of rating the efficiency of an electric lamp of the incandescent type is always difficult, for the reason that the glow is found to vary greatly when



SPRING-ROLLER LAMP HANGER.

the readings are taken at different points. Because of the variable distribution of the light rays, this form of illumination could never be regarded as entirely faultless. What is known as the "hairpin" filament, the first form ever used, varied but slightly in its illumination on the horizontal plane; but it was sadly deficient in its vertical distribution, a very small percentage of its maximum candle power being thrown directly down through the tip. The next step forward was the single loop, which had the effect of increasing the amount of light directed through the tip end of the bulb; but the vertical distribution was much more irregular than with the "hairpin" filament. Following these were the double filament, the anchored coil, and the double loop, but none of these reached the standard set. The latest addition to the assortment of bulbs on the market is one with a spiral filament, which is shown in the accompanying cut beside a "hairpin" filament. The spiral design is said to give the maximum candle power at every point on the vertical as well as the horizontal plane.

It is often necessary to shift the position of a hanging electric lamp. One man likes his light high, while another wants it as near the work as it can be placed. In offices and industrial establishments where one desk or workbench is used by different persons, many curious ways of making the change are brought into requisition.

A device by which this change is at all times readily accomplished is shown in the accompanying cut. The lamp is provided with about ten feet of flexible cord, and mounted on a spring roller which locks automatically at any desired point. By the aid of this arrangement, the lamp can be drawn up or down to any point, in much the same manner as a spring-curtain.

An electric light when hung quite high is necessarily wasteful, for the reason that it is a matter of considerable inconvenience to turn off the current. Of course in such instances a wall switch button may be used, but this entails more or less elaborate wiring and more expensive attachments in the lamp-socket. The thumbscrew with which most of the lamp-sockets are fitted at present is the most simple and economical arrangement which can be devised, and answers all

purposes where the lamp is within easy reach. It is, however, inadequate where it is found necessary or desirable to hang the lamp beyond the ordinary reach, because in order to turn it off after use, it is necessary to secure a chair or ladder. Rather than do this the light would be allowed to remain in operation, running up needless charges for current. With the chain pull just brought out, this matter is solved in a very simple manner. The socket is supplied with a make-and-break attachment of the sliding kind, operated by means of a chain of any desirable length. One pull of this chain extinguishes the light and the next turns it on. This apparatus is said to be quite as convenient as the wall switch and, as stated above, much more economical.

A Substitute for Rubber.

The young shoot of the Rocky Mountain greasewood plant has a milky sap, and the old wood a resinous gum, which is soluble in carbon disulphid and in other known hydrocarbon solvents of rubber. From the young greasewood sap two inventors have discovered a method of making artificial India rubber. The plant is bruised between rollers, whereby the bark is loosened and the woody fiber of the larger stems crushed. The entire mass is then inclosed in a vessel, mechanically agitated, and exposed to the action of carbon bisulphid, carbon disulphid, naphtha, or other solvent of India rubber. After exposure for some hours to the action of the solvent, heat being applied if necessary, the liquid is strained off. The liquid solvent and contained gum are then placed in a closed vessel and the volatile solvent driven off by heat. The gummy mass that will not volatilize in the still or receiver is then washed in water, either warm or hot, and is then subjected to repeated rollings. The gum resulting is of a brown color, highly flexible and elastic, combustible, and seems to possess the characteristics of India rubber, except that it has rather a balsamic odor, differing from the odor of commercial rubber. The gum can be vulcanized by the addition of a quantity of sulphur in the same manner as the India rubber of commerce.

A Novel Horn for Phonographs.

A single horn is ordinarily used in phonographs to discharge the sounds, the small end of the horn being connected with the short tube of the reproducer either directly or by the interposition of a rubber tube connection. It has been proposed to use two horns communicating with opposite sides of the reproducer diaphragm, with the discharge ends arranged side by side. The purpose of this construction is to improve the tone, quality and power. Furthermore, it has been proposed for a similar purpose to employ a number of independent horns mounted upon a part to which a rotary movement is given. The horn in this case consists of a large bell or hood embracing a number of small horns communicating at their smaller ends with a transmitter having a mouth. A throat leads from the mouth to the diaphragm frame of the reproducer. It is claimed that music,

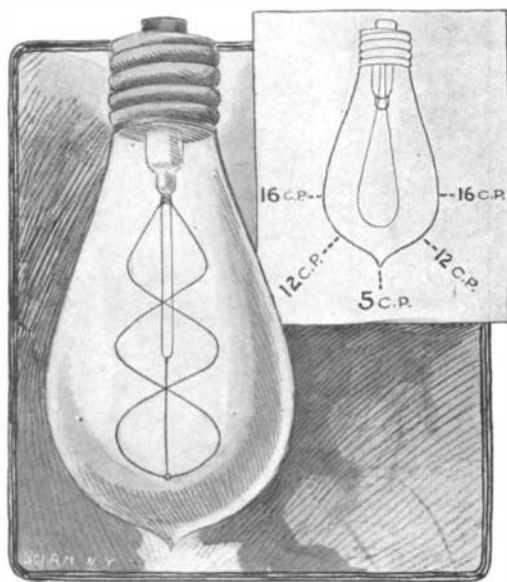


CHAIN-PULL ELECTRIC LIGHT.

vocal or instrumental, is reproduced by this new horn with great clearness, and that the power of every sound is materially improved.

A Sorely Needed Invention.

In the manufacture of oilcloth no means have yet been devised for utilizing the waste trimmings. Since the printing machine for the oilcloth must be absolutely to gage, at least one inch to one and a half inches are lost on each side of a strip of material. These trimmings are particularly valuable because they contain a considerable amount of linseed oil; and a method reasonably cheap and economical is wanted to extract this oil from the trimmings.



THE IMPROVED FORM OF INCANDESCENT LAMP FILAMENT COMPARED WITH ONE OF THE "HAIRPIN" TYPE.

of glowers to any given voltage is determined by length, cross section and composition; and it is generally the practice to make the glowers for use with circuits of any given voltage as nearly as possible of the same composition, the same diameter, and the same length. Despite the utmost care exercised in manufacture, more or less variation from the condition desired is likely to ensue. After the glowers have been completed it is obviously not feasible to change the composition or to decrease either the diameter or the length. Mr. Hanks therefore proposes to provide glowers which actually require higher voltages than those for which they were originally