

RECENT INVENTIONS.

Mr. George Steinson, of East Chester, N. Y., has patented an improved leg for bedstead frames, which furnishes to the bed an elastic support. The leg is formed of flat curved springs, and a spiral spring placed in a box, the whole being supported on casters.

Mr. Fredrick A. Baker, of Brooklyn, N. Y., has patented a fire escape ladder for the use of firemen. It can be readily secured to the windows of buildings from story to story to form a fire escape.

An improved legging, which fits closely to the foot and ankle, and can be opened or closed easily, has been patented by Mr. Casper Riese, of Berlin, Prussia, Germany.

Improvements in electric burglar alarm for safes have been patented by Mr. Edwin J. Leland, of Worcester, Mass. These improvements relate to burglar alarm telegraphs connected with safes, vaults, and similar places, and arranged to give a signal at a central office in case the circuit is broken or the wires tampered with. Such lines usually have combined with them a galvanometer, so that any change of resistance caused by an attempt to put a loop in the line, and thereby cut out a safe or vault without breaking circuit, or from any cause, shall be indicated by the galvanometer. The object of this invention is to provide means for testing the line at any time and determining whether the safe or vault is in circuit, so that it will not be necessary to make a personal inspection of the vault or safe every time the indicator shows a change of resistance or the signal is operated, as such effects are often produced by crossed wires and electrical disturbances in the atmosphere.

An improved bottle stopper has been patented by Mr. Thomas G. Austen, of Oswego, N. Y. This invention relates to that class of devices that are designed so close the mouth of a bottle and yet to permit the gradual ejection or sprinkling of its contents.

Mr. Joseph T. Maybury, of Mobile, Ala., has patented a process of canning oysters, which consists in placing them in cans and pouring over them a hot mixture composed of water, salicylic acid, and vinegar, in the proportions of about ten gallons, one and six-tenths gill, and one-half gallon, respectively, and then closing the cans and placing them in boiling water for a short time.

A novel skylight bar, in which provision is made for collecting the condensed moisture which accumulates on the interior surface of the glass and conducting it to the roof, has been patented by Mr. Fred Ruemping, of Kansas City, Mo.

An improved well casing, which is simple and effective, has been patented by Messrs. Henry Shear and Henry M. Toomey, of Arcola, Ill. The invention consists in a well and cistern casing formed of a number of segmental sections of earthenware or burned clay, provided with tongues and grooves at the ends and with strengthening ribs on the inner sides.

Messrs. William P. Lyon and Samuel Vail, of Port Chester, N. Y., have patented a fastening for the end boards of wagons and carts, so constructed that it will fasten automatically when the end board is raised into place, and which, when locked, will hold the end board securely.

Mr. John H. Reed, of Cowles, Neb., has patented a new penmanship-instructing chart, which will permit persons who are not good penmen themselves to instruct others in the art of penmanship and to explain the proper formation and inclination of letters.

An improved trunk fastener, patented by Mr. George A. Sofield, of Jersey City, N. J., consists in the combination with a bolt tongue having a transverse groove of a socket provided with a longitudinal groove to receive the bolt, and with a transverse groove containing a spring latch fitting into it and catching into the transverse groove of the bolt tongue.

Mr. Patrick H. Duke, of Richmond, Va., has patented a package of plug tobacco having the faces of its plugs formed into perfect squares, one set of which is raised and the alternate set depressed, with the raised and sunken faces of one layer or set of plugs fitting into and over the sunken and raised faces of the crossed piled plugs forming the next layer.

An improved apparatus for distributing fertilizer, which may be made either an attachment of an ordinary seeder or planter, or used independently thereof, has been patented by Mr. Luther A. Horine, of Jefferson, Md.

Mr. Carey Inskeep, of Ottumwa, Ia., has patented an improved hairpin, which is so constructed that it cannot become detached accidentally, but may be inserted and removed without disturbing the contiguous hair further than requisite to allow space for the body of the pin.

Mr. Edward A. Smith, of Greeley, Col., has patented an improved earth auger, which consists in a novel arrangement of the casing, the cutter, and the drill point in a well auger.

Mr. Benjamin Le Coultre, of Geneva, Switzerland, has patented a chronograph having both second and minute hands indicating by one dial and mounted on the same arbor. The inventor fits upon the central arbor of the watch a loose sleeve that carries the minute hand and a driving wheel, and outside of this fits a second loose sleeve carrying the second hand and a driving wheel. Upon a lever fitted for movement by a ratchet wheel in the usual manner are fitted the wheels that operate the second hand from the center pinion when moved into gear, and upon a pivoted arm that is connected with the lever is a pinion that connects a fixed pinion on the center arbor with the driving wheel of the minute hand.

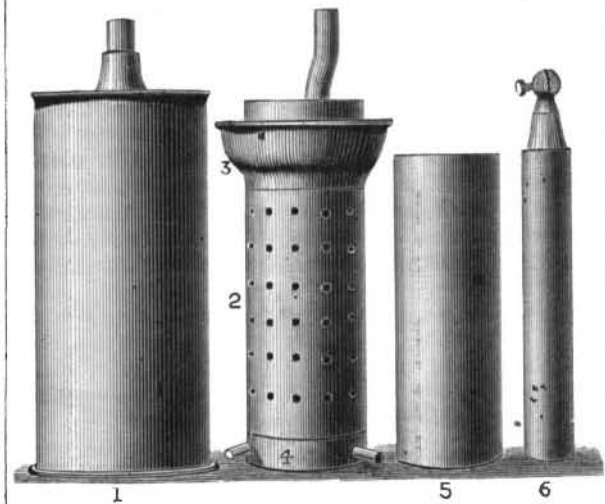
The driving wheels of both the second and minute hands are fitted with heart cams that are acted upon by a T-arm to bring both hands back to the starting point. By this construction a simultaneous action is obtained on both hands—first, to set them in motion; second, to arrest them; and, third, to return them to the starting point.

Welding by Pressure.

Pursuing his researches on the welding of solid bodies by pressure, M. Spring has subjected to various strong pressures (up to 10,000 atmospheres—150,000 lb. per square inch) more than eighty solid pulverized bodies; this was done in vacuo, and in some cases at various temperatures. The results are highly interesting. All the crystalline bodies proved capable of welding, and in the case of bodies accidentally amorphous the compressed block showed crystalline fracture; crystallization had been brought about by pressure. Softness favors the approximation of the particles and their orientation in the direction of the crystalline axes. The amorphous bodies, properly so called, fall into two groups, one of substances like wax (*ceiroid* bodies), which weld easily, the other of substances like amorphous carbon (*aciroid* bodies), which do not weld. The general result is that the crystalline state favors the union of solid bodies, but the amorphous state does not always hinder it. M. Spring says the facts described do not essentially differ from those observed when two drops of a liquid meet and unite. Hardness is a relative, and one may even say subjective term. Water may appear with a certain hardness to some insects, and if our bodies had a certain weight we should find the pavement too soft to bear us. Again, prismatic sulphur is changed by compression to octahedric sulphur; amorphous phosphorus seems to be changed to metallic; other amorphous bodies change their state, and mixtures of bodies react chemically if the specific volume of the product of the reaction is smaller than the sum of specific volumes of the reacting bodies. In all cases the body is changed into a denser variety, whence may be inferred that the state taken by matter is in relation to the volume it is obliged to occupy under action of external forces. This (M. Spring points out) is merely the generalization of a well known fact. Some curious results are deduced from it. The researches described have important bearings on mineralogy and geology.

A MODIFIED DANIELL CELL.

Mr. S. J. Browning, of Portsmouth, England, has devised a modified form of Daniell cell, which he thus describes in the *Electrician*:



"While using the same materials, and the same strength of solutions as those of the ordinary Daniell, it gives twice the amount of current.

"It can be clearly perceived that my main object has been the reduction of the internal resistance, which I believe I have accomplished to the utmost without reducing its constancy."

The accompanying diagrams illustrate this cell: 1. Outer copper cylinder. 2. Inner copper cylinder, which encircles the porous cell within one-eighth of an inch of same. 3. The copper shelf surrounding No. 3, for holding sulphate of copper. 4. A wooden cylinder with step turned inside, to keep porous cell in center of No. 2, and with three wooden plugs, to keep No. 2 in center of No. 1. 5. Ordinary eight inch porous cell. 6. Cylinder of zinc.

Mr. Browning uses small blocks of vulcanized India rubber to keep the zinc in the center of the porous jar, and again to keep the porous jar in the center of the cylinder. He also uses a disk of felt for the zinc to rest upon.

High Lighting by Electricity.

There was very little to encourage the project to illuminate Holyoke, Mass., by means of lofty electric light towers, in the result of the similar experiment tried in Rouen, France, during the *fêtes* of July 13 and 14. On that occasion eight electric lights were placed on the spire of the cathedral with a view of illuminating the town. Though the quantity of light was estimated at 5,000 Carcel burners, the effect was practically *nil*. The spire seemed merely to have a huge lamp on it, which threw its light beyond the town rather than in the neighborhood of the cathedral.

A New Process of Refining Petroleum.

The Philadelphia *Record* says that a new process for treating the products of petroleum is being tested in that city. At present all oils are brought to heat tests by distillation, and in the process lose from 30 to 65 per cent. By the old process oil at a fire test of 110° costs 6½ cents per gallon. In bringing this grade of oil to a test of 150° it loses 30 per cent in the process of distillation; to raise it to 175° it loses 45 per cent, and to 185° 65 per cent. By the new patent process the oil is treated without heat and loses nothing.

Oil at 110° that cost 6½ cents per gallon, on being raised to a fire test of 150 is worth 13½ cents per gallon; to 175, from 15 cents to 17 cents per gallon, and if raised to 185° is worth from 18 to 20 cents per gallon. The cost of raising it to any of these tests is 1 cent per gallon. Here, also, is another advantage over the old system, as by the present method of distillation the profit on oil at a fire test of 110 is only half a cent per gallon, and at a test of 150 the profit is the same; whereas by the new process, the oil losing nothing in the manipulation, the profit is in a ratio to the number of degrees to which the fire test is raised. In the process the oil is deodorized, and at the same time the illuminating quality is improved so that the oil burns longer and brighter, and this is effected without the aid of any heat whatever. This is what the inventors claim for the new process, but until a rigid and satisfactory test has been made they will disclose neither their plans nor their names.

Eruption of Fuego.

A letter from San José de Guatemala, dated the 2d of July, to the *Panama Star and Herald*, says: "At 3 A.M. on the 29th of June, the volcano Fuego suddenly became active, throwing out vast showers of fire and cinders, with great darts of flame shooting up from 350 feet to 500 feet above the mouth of the crater. The whole country to the east and south was magnificently illuminated. At 3:40 A.M. two streams of lava could be seen running down the sides of the volcano, one to the south and east, the other to the westward. Dense masses of steam and smoke rose from the courses of the lava streams, as the shrubbery and foliage were burnt. The river Guacalate rose suddenly, and its waters were quite warm. Fuego continued to belch fire until daylight, by which time the whole northern horizon looking from San Jose, was dark with the smoke from the volcano. The lava streams continued in view until 4:30 A.M. The first grand column of fire rose at least 500 feet in height, solid and smooth, and then the top, expanding, opened out like an umbrella, the sparks coruscating like those from a brilliant rocket. The pulsations of flame during the first two hours of the eruption were about 50 seconds apart, strong and regular. The eruption was less active until, at 7:30 P.M. on the 1st of July, a column of flame rose to a height, probably, of 150 feet or more. At the hour of writing Fuego smokes away steadily."

A Queer Locomotive.

The *National Car Builder* condenses from the Paterson (N. J.) *Guardian*, a description of a new locomotive now in process of construction at the Grant Locomotive Works, which, it is thought, will eclipse for speed anything yet built. It will look like an ordinary engine turned upside down. The machinery will be on top of the boiler instead of under it, as usual, and the boiler will hang very low on the wheels. There will be two pairs of driving wheels, but instead of having them follow each other, one pair will be on top of the other. The real driving wheels will be the upper pair, and they will turn in the opposite direction from that in which the engine is going. They will rest upon the rims of the other pair, which will in turn rest on the track. The revolution of the upper pair, by friction, is expected to drive the lower pair, the tires of the latter serving as tracks for the upper ones. It is thought that a good deal greater speed can be got out of the machinery by this construction, and it is expected by the inventor that it will be the fastest locomotive ever made. Practical workmen, however, think it won't go at all. It will look very funny as it is running through the country, with the upper pair of driving wheels, five feet in diameter, revolving up in the air in the wrong direction at a tremendous speed, and the eccentrics, rocking bars, link motion, and pistons on the top of the boiler.

After Graduation.

A few years ago a young man of promise was graduated at Harvard University. He determined to become a cotton manufacturer. Instead of relying upon his general education, and waiting for an opening, as many of his classmates did, he began at once to prepare specially for the business he had chosen, by entering a machine shop as a workman—making full hours and acquainting himself with every part of the machinery of a cotton mill. From the machine shop he went into the cotton mill, and by hard work and close attention rapidly acquired a thorough knowledge of all the processes of cotton manufacture. While some of his classmates were waiting and looking for an opening in business, and others were with difficulty filling subordinate positions, he was rapidly rising, step by step, until he is, to-day, in charge of one of the largest cotton mills in New England, with ample salary, and what is better, is discharging the duties of his position with great satisfaction to the company he serves.—*Providence (R. I.) Journal*.

**Human Refrigeration.**

Some experiments which seem to throw light on the physiological effects of bathing have been recently made by Dr. Paul Delmas, of Bordeaux. The action of cold and heat on the human system was studied by subjecting the whole body, except the head, of a healthy and robust subject to refrigeration with water at  $+10^{\circ}$  C., in a suitable apparatus, the time of exposure varying from 15 seconds to 5 minutes. In some cases heat was applied previously. The pulse and temperature were noted all the time, and every five minutes in succeeding hours; the temperature by means of a thermometer placed in the mouth. The following effects were observed: During application of the cold, while the subject shows every sign of very intense sensations (painful or otherwise), the temperature of the body scarcely varies at all, or varies at most one to two tenths of a degree, from that noted before; and previous heating does not affect this result. If, immediately after the application of cold, the subject remain perfectly still, after having been carefully dried and dressed, so as to avoid all active muscular movement, the temperature still varies little or not at all; but if he exert himself actively (in dressing, running, or walking), either immediately after the cold application or after a time of immobility, so as to bring on all the external phenomena of cold reaction, the temperature suddenly falls. The reduction persists several hours, and is more pronounced the stronger the sensation of heat in the subject. On the other hand, if chill continue or reappear owing to long immobility or suspension of exercise, the animal temperature does not fall, or immediately rises again. The amount of lowering of the temperature two or three hours after a cold application was, in eleven cases out of twelve,  $0.1^{\circ}$  to  $0.6^{\circ}$ . The *maximum* in a very vigorous subject never exceeded  $1.3^{\circ}$ . At the commencement of the cold application the pulse suddenly becomes very quick; after 10 to 15 seconds the velocity rapidly diminishes; and at the end of the experiment has returned to the previous figure or below it. If the subject, carefully dried and dressed, keep quiet, the retardation of the pulse stops or progresses slowly; but in the opposite case it is very pronounced, and persists the more the subject gives signs of energetic reaction and a general sensation of heat. Two or three hours after the cold application the pulse showed (in eleven cases out of twelve) two to twenty pulsations fewer than before the experiment.

**IMPROVED VALVE-GEAR FOR ENGINES.**

A novel device for reversing a steam engine is shown in the annexed engraving. The arrangement is such as to admit of reversing the valves when the engine is either at rest or in motion.

The crank pin projecting from the crank disk, A, is elongated so as to be capable of engaging either of two lugs projecting from the face of a wheel, B, mounted on the inner end of a shaft placed on the axial line of the main shaft. The shaft of the wheel, B, carries a crank or eccentric which operates the slide valve, and it is driven by the engagement of the crank pin with one of the lugs. When the engine is to be reversed the wheel, B, is turned so as to bring the opposite lug into position to be engaged by the crank pin. The valve is shifted by this operation, and when the engine is started its motion will be reversed.

To reverse the engine while in motion, an appliance consisting of a lever pivoted to the engine bed and carrying a shaft having friction wheels, C, D, at opposite ends, is brought into use.

These wheels are capable of engaging with the wheels, A, B, as shown in the detail view, and the wheel, C, is made smaller than the crank disk, A, so that when it is brought into engagement with the crank disk it will communicate motion to the wheel, B, through the friction wheel, D. By this means the wheel, B, will be turned ahead much more rapidly than its normal rate of speed, the valve will be reversed, and the lug on the opposite side of the wheel, B, will be engaged by the crank pin, and the engine will move in a reversed direction.

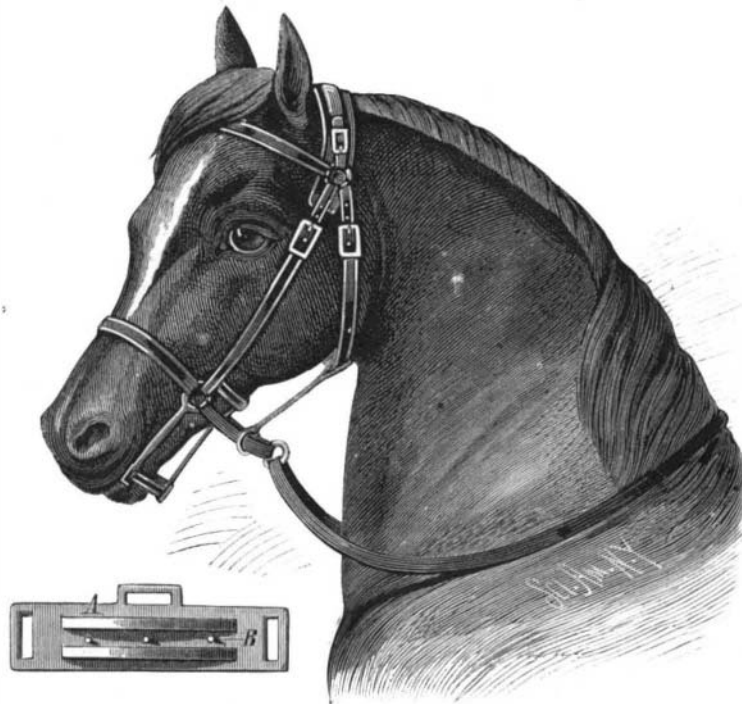
When the crank shaft carries a regular crank instead of the disk and crank pin, said crank is provided with a projection for engagement with the lugs on the wheel, B.

These lugs may be secured to the wheel, B, by means of bolts working in slots, so as to enable the stops to be adjusted in order to regulate the lead of the valve.

This invention was lately patented by Mr. Peter Josseland, of Hockley, Texas.

**HALTER TO PREVENT HORSES FROM CRIBBING.**

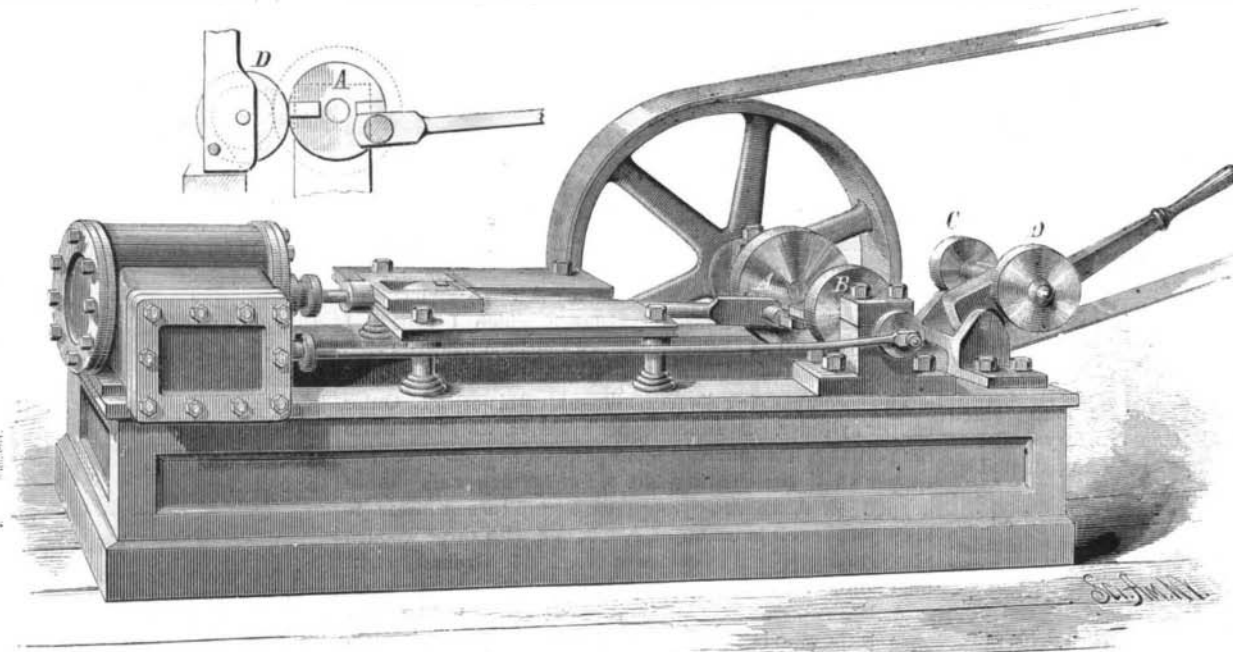
The engraving shows an attachment to be applied to halters to prevent horses from cribbing and for curing them of this habit. The invention is shown in use in Fig. 1, and in detail in Fig. 2. A plate, A, carrying a row of spikes, B, is connected with the halter by means of rigid arms and straps, and is held beneath the animal's under lip. Ordinarily the spikes are prevented from pricking the horse by the curved

**MADDEN'S HALTER FOR PREVENTING HORSES FROM CRIBBING.**

springs arranged on opposite sides of the row of spikes; but the motion of the horse in the act of cribbing compresses the springs and brings the horse's lip into contact with the points of the spikes.

This attachment does not in any way interfere with the free movement of the head and mouth, but when the horse drops his lower jaw and seizes the manger, as in the habit of cribbing, the spikes will prick the under lip and the habit is soon broken up. This attachment is equally useful for vicious horses, as it prevents them from biting and tearing their blankets.

The invention has been thoroughly tested, and its merits are approved by horse trainers and owners. It was recently patented by Mr. Ambrose Madden, and is being introduced by Messrs. Madden & Sullivan, P. O. box 283, Asbury Park, N. J., who should be addressed for further information.

**JOSSERAND'S VALVE-GEAR FOR ENGINES.****MISCELLANEOUS INVENTIONS.**

Mr. Louis Prince, of Nashville, O., has patented an improved car door operating mechanism for street or elevated railroads, arranged with transverse seats extending the entire width of the car, and provided with a series of doors upon the sides of the car which communicate separately with each seat. The object of the invention is to provide means for operating a series of such doors simultaneously from the end of the car, so that they may be under the control of the driver or conductor.

Mr. Johann W. R. Vogdt, of Potsdam, Prussia, Germany, has patented a curtain formed of a series of vertical strips or bands of cloth, or other suitable material, alternately attached to two rollers pivoted parallel to and adjoining each other in the top of the window casing, and provided with suitable cords or devices for rotating them both at the same time.

A blind adjuster and fastener, so constructed as to hold blinds in any position into which they may be adjusted, and prevent them from rattling, and which at the same time can be operated from the inside of the window and without raising the sash, has been patented by Mr. Charles L. Rainhart, of Catskill, N. Y.

A new attachment for basket handles, which is simple and durable, has been patented by Mr. Amedee Hourdeaux, of Lichtenfels, Bavaria, Germany. It consists of a staple passing through an eyelet at the end of the handle and through two slotted disks on the outer and the inner sides of the wicker work of the basket; the ends of the staple are then lapped down on the surface of the inner disk to prevent the staple from being drawn out by the handle.

Mr. Samuel P. Fraley, of Columbus, O., has patented a broom-brush that may be cheaply made by mechanical means, and is held together independently of the holder and handle without the use of stitches.

An improved terra-cotta kiln has been patented by Mr. Alfred Hall, of Perth Amboy, N. J. The object of this invention is to construct the doors of kilns for burning terra-cotta in such a way that the heat will be distributed equally through the door and the other parts of the kiln, so that all parts of the kiln will have a uniform temperature, and all the articles will be burned evenly.

Heretofore, where bells have been used for giving notice of fire, either by a general alarm or by striking the number of the signal box, much confusion has resulted from indistinct alarms or errors in counting. In some cases the fire alarm telegraph has been arranged to strike the number of the box, and bells not connected with the system are rung by hand, and it is of frequent occurrence that the box number is not heard at all except by the bell ringers. Mr. John H. Tilley, of Newport, R. I., has invented a transmitter for fire alarm telegraphs that will first act to give a

general alarm, and, after an interval, strike the box number and repeat the number, as required, thus calling attention, first, to the fact of the fire by an alarm which is likely to be heard, and then giving the locality.

Mr. David Untermeyer, of New York city, has patented an improvement in the class of necklace clasps which are provided with spring catches or fastenings for attaching the neckchain or necklace proper.

A rowing vehicle has been patented by Messrs. Charles E. Tripler and William H. Roff, of New York city. The object of this invention is to furnish wheeled vehicles that are operated by hand levers, and so moved that the operator, in propelling the vehicles, pulls the hand levers in substantially the same manner that the oars of a boat are pulled.

Messrs. Henry J. Mark and William F. Martinek, of St. Louis, Mo., have patented a wrapper or jacket for bottles and analogous articles having spiral or diagonally arranged grooves or corrugations.

Mr. William T. McLean, of Sidney, Ohio, has patented an improvement in the class of earth scrapers or scoops having a thin metal body, formed preferably of rolled sheet steel, and a wooden back, which is secured to the body by means of clamps, etc. The improvement consists in the arrangement of the devices for securing the wooden back to the steel body of the scraper, and in providing the latter with a single longitudinal steel wearing piece or shoe, which is arranged centrally, and beveled on the sides and front end.

Amédée G. Sébillot, of Paris, France, has

patented an improved apparatus for the recovery of waste sulphuric acid. The object of the invention is to improve the product obtained from treating argentiferous ores, as well as to save the acid used in the process.

An automatic fire extinguisher has been patented by Mr. Edward Bocker, of New York city. The object of this invention is to furnish mechanism to be connected with the faucets of water pipes, and so constructed that upon the rise of temperature in case of fire the faucets will be opened automatically and discharge water.