COPERNICUS BY EARTH LIGHT.

On page 82 of the current volume, we gave a condensed report of a lecture by Professor Morton, of Philadelphia, and of the magnificent experiments by which the lecture was illustrated. We also described some splendid photographic views of the moon, and of the planet Mars, among which was the view of the lunar volcano Copernicus. We herewith reproduce this view from the Journal of the Franklin Institute, and we feel that in so doing we are presenting an engraving that will prove of the greatest interest to our readers. Who does not long, while gazing upon the serene face of the queen of night, as she glides in majesty over a cloudless sky, to know and see the hidden wonders of her structure? Her mean distance from the earth is two hundred and forty thousand miles, yet it is hard to realize on one of those glorious autumn evenings which occur in our latitude, that she is so far away. It is even harder to realize that her fair face is seamed, and scarred, and blotched, and torn—a scene of the wildest confusion, a dreary, barren, and lifeless desert, only variegated by rude precipices of enormous height and extinct volcanoes, which, in their former active state, must have presented a spectacle of the aroused forces of nature beyond conception, awful, and sublime.

We ordinarily see the moon by means of the light of the sun reflected from her surface. During one half of her revolution, however, the sun shines upon the portion of her surface which is entirely or partially turned away from us, leaving the side which is toward us, dark, with exception of the light which falls upon it from the stars and planets, and the light of the sun reflected from the earth. Surfaces are good reflectors of light, in proportion to their smoothness. A body like the earth can, therefore, be only an imperfect reflector. Even the water, which, if at rest, would form a more perfect reflecting surface than the land, is rarely perfectly still; and the regions near the poles, where the water is congealed into snow and ice, present also great irregularities of surface. Color has also much to do with the amount of light which bodies reflect, and all reflecting bodies which have not pure white surfaces, modify more or less the character of the light which they reflect. Snow is, therefore, a better reflector than the bare earth, both because it is white, and its surface is smoother than the land which it covers. All bodies seen by reflected light are less illuminated than the reflecting surface. The moon, viewed only by the reflected light of the earth, stars, and planets, is, therefore, very dimly seen. The eye, unassisted, can scarcely see more than the mere outline of her form. When the moon is entering upon her first quarter, she may be seen as a thin crescent upon that side of her disc which lies nearest the sun. The remaining portions being only just perceptible. The dark portions of the moon which, seen at the full, are fancied to resemble the human face, are shadows cast by the summits and craters of extinct volcanoes. The principal mountains which form these shadows are called Tycho, Copernicus, and Kepler. The largest of these is Copernicus, which has a crater fifty-five miles in breadth. Its height above the surrounding plains is eleven thousand two hundred and fifty feet.

The engraving represents this immense crater as seen by earth-light. It is a vast plain surrounded by a circular wall, with central cones and huge boulders scattered over its surface. Mars, proportionately magnified, is seen above the horizon, with masses of clouds floating in his atmosphere, and showing the marks of continents and seas. In the immediate vicinity are seen lesser craters, their edges illumined, and inclosing gulfs of vast depths and proportions. The rugged and mountainous appearance of the moon is admirably shown, and the appearance of desolation most truthfully delineated. What features are presented by the side of the moon which human eyes have never seen we cannot certainly say; but it is probably just to infer that it possesses the same general characteristics as the side presented to us. The craters of some of the lunar volcanoes are of immense depth, their sides rising almost vertically, often to a height of many thousand feet.

In 1787, it was announced by Sir Wm. Herschel that he had observed three volcanoes in a state of eruption upon different parts of the moon. Astronomers have, however, generally supposed that the phenomena seen by Herschel were due to peculiar reflections of earth-light from portions of the peaks having great reflecting power. There have been, without doubt, some recent changes in the craters, which are found everywhere upon the moon's surface. In 1866, Schmidt, Director of the Observatory of Athens, observed the total disappearance of the deep crater Linné. In its place remained only what appeared to be "a little white cloud." This obscuration, which was observed by other astronomers, occurred in October and continued till the latter part of December, when the crater was again distinctly visible. The cause of this phenomenon has never been explained; but it indicates that the forces which have so convulsed the surface of the moon in ages past, have not yet fully expended their energies.

A SINGLE coffee plant, taken from Arabia to Paris, in 1614, was the parent stock of all the coffee plantations in the West Indies.

Correspondence.

The Editors are not responsible for the opinions expressed by their correspondents

Experiments---The Condensation of Alcohol by Frost.

MESSRS. EDITORS:—Being induced to believe that the severe frosts of winter may be utilized in the condensation of alcoholic liquids, by the freezing of the water combined with the alcohol, and subsequent separation of the water by draining off the unfrozen liquor, leaving the water in the bottle as ice, I instituted the below-described experiments to satisfy myself as to the correctness of this idea:

A bottle of pure new grape wine, having been exposed at a low temperature, appeared to have become frozen. Upon examination I found that its contents were only partially frozen, a feathery crystallization filling the bottle, the interstices between which were occupied by the unfrozen liquid. Suspecting that this latter was prevented from freezing by the greater amount of alcohol which it contained, I decanted the unfrozen liquid into another bottle, leaving the ice (or water) in bottle No. 1. Though the liquid thus decanted remained a liquid, the ice in No. 1 remained unthawed. No. 2 was finally frozen, however, by the increasing severity of the weather (winter of 1867–'68), which, as the technical nature of the experiment demanded, was my only reagent for reduction of temperature. A crystallization similar to that in the first instance also existed throughout the contents of the second bottle, No. 2; but as before, a portion of the liquid did not congeal. This also was decanted, the operation being repeated until the original wine had been separated into five portions, the last decanted of which—the fifth—which was of a ruby red color—refusing to congeal even at a temperature of from 28° to 30° Fah.

The liquids thus separated had the following peculiarities: The liquid in bottle No. 1, which was obtained by thawing the ice, formed in the first instance by the partial congelation of the wine, was greater in amount than any of the separated liquids, having a slight amberish tint, though almost clear.

No. 2. This liquid was one quarter less in amount than that in No. 1, but had much the same color and quality, containing, however, a little organic, saccharine, and volatile matter, with tartaric acid, depositing one half to one quarter of a minim of sediment from seventy-five minims of liquid.

No. 3. The liquid in receptacle No. 3 was still less in amount, one quarter less than the contents of No. 2. Color, red amberish, light tint of red prevailing. Organic, volatile (alcoholic), and acid matter, etc., were present in increased quantity.

No. 4. Amount of liquid one quarter less than No. 3. Color, clear red; about five minims in one hundred and eighty minims of liquid, being a faint reddish sediment of organic matter, containing much tartaric acid.

No. 5. The amount of liquid was similar in its proportion to the rest, being about equal to three quarters of the contents of No. 3; its specific gravity being perceptibly greater than any of the preceding. Color, deep, rich red; liquid, sirupy and rich.

The comparative amount of liquid, color of, and specific gravity of, was, in a sort of proportion, much as below:

LIQUID No.	No. 1.	No. 2.	No. 3.	No. 4.	No. 5.
Amount of liquid in dr., and fractions of.	9·4	7·05	4·7	3.525	2·1+
Color of liquid.	Clear.	Amberish.	Faint Red.	Red.	"Deep, rich Red."
Specific gravity in proportion of.	0·6	0·7	0·8	0·9	1·0

The next step taken in the examination of the separated liquids was a fractional distillation; or the separation by heat (in the form of vapor) of the different substances existing in the liquids.

No. 1. The liquid denominated "No. 1" was not distilled, being little but water.

No. 2. Also undistilled (only differing from No. 1 in leaving a sediment).

No. 3. One hundred and eighty minims of this reddish liquid being distilled, gave one hundred and fifty minims clear distillate; thirty minims remaining in tube-retort, and consisting of fined carbon and yellow volatilizable matter, which latter was almost inappreciable. It was probably derived from the decomposition of the sugar present. About five minims out of one hundred and eighty minims was a precipitate containing tartaric acid.

No. 4. One hundred and twenty of the clear red liquid being distilled, yielded one hundred and ten minims, clear distillate; about three minims of yellow liquid of empyreumatic odor was rendered by severe heat (fusing of tube retort), and seven minims of fixed carbon, etc., remained. About four minims in one hundred and eighty minims was a brown sediment containing much tartaric acid, together with some organic or microscopic vegetable matter. Alcohol and sugar, undetermined; though the former was present in some quantity in the clear distillate, and the latter (sugar) existed in quantity in the remainder, being afterward metamorphosed by heat into the yellow liquid and fixed carbon.

No. 5. In this instance the record of amounts and results distilled was unfortunately lost; however, the general tenor of the experiments suffices. This was the rich, blood-red liquid, heavy and sirupy; greater in specific gravity than any of the preceding. From its characteristics I was led to suppose that I had succeeded in condensing nothing but the sugar. Here, however, I was mistaken; the clear distillate which first passed over was a proof spirit, inflammable. A piece of paper dipped in it was lighted upon being brought near flame. Much of the yellow liquid before described passed over with severe heat, and considerable "fixed" carbon remained in tube, covering the sides of tube with a black scale, that shrunk with a "crinckling" sound upon the cooling of the tube.

From the result of these experiments I was led to infer that the process of freezing and decantation, etc., had been one of condensation.

That from the regular increase of specific gravity in the liquids, something besides alcohol was being condensed. From the results of distillation, caromel and yellow liquid, having the odor of burnt, or, rather, decomposed sugar, sugar was supposed, also, to have been condensed. Tartaric acid, or tartrates, were also condensed.

My conclusions are, that, by the method described, alcoholic liquids, wines, etc., may be condensed; the sugar, alcohol, and tartaric acid, being the condensed substances. I have thought that the condensation of the sugar was more complete than that of the alcohol and tartaric acid.

A hundred casks of wine, of an inferior grade, may, by freezing and decantation in the winter season, be condensed into a less in amount, but stronger, more sirupy, and valuable "port" wine.

It is a fact, that, from a barrel of fermenting cider, well frozen, may be drawn gallons of strong drink, unfit for temperance folk.

It is a fact of the "Sugar Bush," that maple sugar-makers, when, on a sharp morning, they find a bucket of sap standing half frozen under the tap, throw out the clear, tasteless ice, and find a thick syrup beneath.

Hoping that these hasty notes may not be without interest, and, perhaps, of assistance to those desirous of pursuing the subject further, or may save others from wasting time upon an already explored field, I remain, respectfully,

Albany, N. Y. VERPLANCK CALVIN.

Change of Pitch in the Tone of Moving Bodies.

MESSRS. EDITORS:—In regard to this subject—first mentioned by a correspondent, page 247, Vol. XVIII, and correctly explained by Mr. Welling, page 323, same volume—it may be remarked that I was present at the first experiments, made in Holland about the year 1845, on the railroad from Amsterdam to Rotterdam, of which the purpose was to ascertain if practice would fully verify the teachings of theory, as to the amount a musical tone would become sharp or flat, when the distance between the ear and the instrument producing the tone was rapidly diminishing or increasing. It was done simply by sounding a trumpet or other loud musical instrument on one train, and observing carefully the pitch on the other train passing in an opposite direction, or similarly sounding the instrument on board the passing train and observing it upon the road, or *vice versa*. The results were always perfectly in accordance with the theory.

The theory is very simple. For instance, the middle C of the musical scale makes 256 vibrations in one second, which are transmitted with a velocity of nearly 1,100 in the same time. Suppose now we could move toward the sounding body with a velocity of 1,100 feet in a second, twice the number of vibrations, or 512, would reach our ear, which corresponds with the octave above and the tone would appear an octave higher. Such velocity is, however, at present beyond the power of actual experiment, but the illustration serves to make the theory clear. As the octave is divided into twelve so-called semitones, we can easily find how fast we have to move to raise the pitch a semitone; namely, the twelfth part of the velocity of sound or about ninety feet in

a second, about sixty miles an hour or one mile in a minute. When we move from the sounding body with this velocity, the opposite will take place; one twelfth of the vibrations will reach our ear and the tone will appear flattened a semitone. When the sounding body moves and we are at rest the effect will be the same. as is self-evident.

When two railroad trains are passing one another and one locomotive sounds the whistle, the passengers in the other train will hear a higher note, when the trains are approaching, due to the combined effect of the two motions. When each train is moving at a velocity of sixty miles an hour, the rise of pitch will be a whole tone above the real note. When the trains have passed and the distance intervening is increasing at the same velocity, they will then hear the sound a whole tone below the true one. Hence, at the moment of passing a change of pitch will be observed of two whole tones or a major third. Both trains, however, seldom reach this velocity, and the change of pitch usually observed will seldom be more than a minor third, or one tone and a half, which corresponds to a mean velocity of each train of one fifth less than sixty, or forty-eight miles an hour. The same fact is observed in the sound of the locomotive bell when it is rung in passing.

When traveling at night I have often amused myself in noticing the correct interval of this change in pitch; deducing from it the sum of the velocities of the two passing trains. Then, by knowing the size of the drive wheels of the locomotive of my train, and taking into consideration that four puffs of steam correspond always with one revolution, and timing the velocities of these steam puffs, I had the key to the velocity of my train; and subtracting this from the total velocity obtained the velocity of the train which had passed, and of which nothing but the changing pitch of the whistle had been observed. P. H. Vander Weyde, M. D.

New York City.

Explosive Gases in Steam-Boilers.

Messrs. Editors:—The explanation of the highly interesting case, mentioned by a "Practical Engineer," page 35, is evident. When the supply proper refused to give water, there was, of course, a lack of water in the boiler; and, notwithstanding that the engineer withdrew his fires, some part of the boiler became hot enough to decompose the steam, not into its elements (this is a pure speculation, having no fact to support it), but the iron became oxidized by the oxygen of the water, and the hydrogen was set free, which is always the case when steam is in contact with red hot iron It is, in fact, one of the ways to manufacture hydrogen. The boiler being closed, and the hydrogen not soluble in water, it remained there; and when, after cooling, the man-hole was opened, air enough entered to form with the hydrogen an explosive mixture, to which the engineer set fire with his lamp. Any practical chemist, acquainted with the enormous explosive power of oxygen and hydrogen, mechanically mixed in such proportion as they are chemically combined in water, will agree that, if such a mixture had been in the boiler, something much worse would have happened to the engineer and to the boiler also. In this case it was simply hydrogen and common air, which may be considered almost harmless, when compared with the tremendous power of hydrogen and oxygen. P. H. Vander Weyde, M. D.

New York city.

The Use of Ozone in Sugar Refining.

Messrs. Editors:—In your journal of June 23d and August 5th, I notice two articles on the use of ozone as a decolorizing agent in a sugar refinery. Having visited that refinery about six weeks since while in London, I thought that the following facts might be of interest to you.

The first experiments in bleaching sugar by ozone were made in the country, about sixty miles from London, and were a perfect success, changing a dark brown solution of sugar to a straw color in a few minutes, and at the same time depositing all the foreign substances. The result of these experiments being so satisfactory, the owner of a sugar refinery in White Chapel was induced to put up a steam engine to drive an electric machine and bleach sugar by these means; but it has proved a total failure on account of his inability to produce ozone in any quantity. The owner of the refinery attributes this to the air of London being, to a great extent, deprived of that gas by its immense population. Be that as it may, until somebody discovers a means of obtaining that gas in large quantities at a moderate price, sugar refining by ozone will remain in its present condition. H. W. B.

Philadelphia, Pa.

Useful Hints for the Season by Septimus Piesse.

Remedy for Insect Bites.—When a musketo, flea, gnat, or other noxious insect punctures the human skin, it deposits or injects an atom of an acidulous fluid of a poisonous nature. This causes an irritation, a sensation of tickling, itching, or of pain. The tickling of flies we are comparatively indifferent about; but the itch produced by a flea or gnat, or other noisome insect, disturbs our serenity, and, like the pain of a wasp or bee sting, excites us to a "remedy." The best remedies for the sting of insects are those which will instantly neutralize this acidulous poison deposited in the skin. These are either ammonia or borax. The alkaline reaction of borax is scarcely yet sufficiently appreciated. However, a time will come when its good qualities will be known and more universally valued than ammonia, or, as it is commonly termed, "hartshorn." Borax is a salt of that innocent nature that it may be kept in every household; it can be recommended as a domestic and harmless chemical. The solution of borax for insect bites is made thus:—Dissolve one ounce of borax in one pint of water that has been boiled and allowed to cool. Instead of plain water, distilled rose water, elder, or orange flower water is more pleasant. The bites are to be dabbed with the solution so long as there is any irritation. For bees' or wasps' stings the borax solution may be made of twice the above strength.

Water Coolers.—We all know that cold water during the summer is one of the greatest luxuries. When it is generally understood that evaporation produces cold, it will be evident that any vessel or material that favors evaporation will induce this result. Now, all porous and absorbent vessels are of this character. Pottery not glazed is porous. A linen clothed dipped into water is porous, absorbs water, and when exposed to the air the water evaporates, producing cold; hence, if any vessel be covered with a damp cloth, the interior will be colder than the exterior. A water cooler is a porous vessel, which allows evaporation to take place on its outer surface, thus cooling the contents. The water coolers, as sent to us from Staffordshire, have, however, one fault; they are not sufficiently porous; hence there is only a very slow infiltration from the inner to the outer surface, and any minute organic substance that may be in the water is arrested by the crock. After a time, this organic matter, it is often observed, undergoes decomposition, giving a musty, earthy odor to the water that may be in the vessel. When this is the case, it should be cleaned both inside and out, with an ounce or two of strong muriatic acid, rubbing the exterior with a flannel wet with the acid, followed with clean hot water. After this treatment the vessel will be, as before, a good water cooler.

Lemon Kali.—A teaspoonful of this compound in a tumblerful of fresh cold water, forms a very agreeable effervescing summer drink. When made, it must be preserved in a dry place, and in well-corked bottles, otherwise it will soon be spoiled. To make it, take one pound of powdered white sugar, half a pound of bicarbonate of soda, half a pound of citric acid, powdered, and half a drachm of essence of lemon. Sift the whole well together, then put it into dry, wide-mouthed bottles. Tartaric acid may be used instead of the citric acid at less expense, but it is not so good for general use. Citric acid is the true acid of the lemon; tartaric acid is derived from grape lees, tamarinds and other fruit. The pleasing flavor of lemon kali depends much upon the quality of the essence of lemon, which rapidly spoils in druggists' shops, and smells like turpentine. See that you have good and fresh essence of lemon.

Fleas in Dogs.—Fleas trouble dogs, and one of the best remedies is the following: Rub colza or common olive oil into the coat, saturate the hair with the oil to the surface of the skin, let it remain on for half an hour, then well-wash out the oil with the best yellow soap and lukewarm water. A small portion of any sweet oil brushed into the coat of a woolly dog, will prevent its being infected with vermin. Matrons of large schools may advisedly take this hint. Insects of every kind have a "life and death" dislike to grease in any form.

MANUFACTURING, MINING, AND RAILROAD ITEMS.

An iron steamer, the first ever built there, was launched at Cleveland, Ohio, on Saturday, 25th ult.

It has been suggested in England to unite Scotland and Ireland by a tunnel. The distance of the proposed terminii is about fourteen and a half miles, and the cost is set down at £3,150,000.

Sun-dried oysters, cured like beef by hanging in the sun, are becoming an important article of trafic in California.

Ninety locomotives are now in use on the Union Pacific Railroad, and a hundred and seven others have been ordered.

An imperial French decree suspends the tunnage on vessels entering the ports of the Empire with breadstuffs for three months from the 1st of October next. This would seem to imply a short harvest in France.

Discovery of Chloride of Potassium.—A vast deposit of pure chloride of potassium has been discovered in a salt mine in Hungary. This must prove of great commercial value to Austria.

Appropriations for Improvements.—Congress appropriated a million and a half dollars for river and harbor improvements at the late session. Three hundred and fifty thousand dollars go for the improvement of the Mississippi.

New Ocean Steam Route.—A contract was concluded, a short time back, by the Chilian Government with the Pacific Steam Navigation for direct mail communication with England. The voyage out and back must be completed in forty-two days. The first ship sailed on the 13th of July.

Sugar in Brewing.—The use of sugar in British breweries has largely increased. During the year 1867, 41,143,000 pounds were consumed. Narcotic adulterations of an exceedingly deleterious nature are often added to the liquor.

A New Phase in Economy.—A species of co-operation system has been adopted by the Pennsylvania Railroad Company. It is agreed to divide among the engineers and firemen all that they save from last year's expenditure of fuel, oil, and other articles in running their locomotives

Peat as Fuel for Locomotives.—Mr. F. Trevethick, has been making experiments in Canada on the engines of the Grand Trunk Railroad. He seems to have arrived at the conclusion that a ton of peat (2,240 pounds) is equivalent to a ton of the best wood.

Large Salt Mine.—Near Berlin, Prussia, an enormous salt mine has been discovered. The thickness of the bed is five hundred feet, and its extent has not yet been determined.

How a Strike was Conquered.—A shoe manufacturer in North Adams, Massachusetts has conquered a strike in his factory and is now running it with a full force of workmen. He secured forty-three men in Montreal, and now employs none who belong to a "Union."

NEW PUBLICATIONS.

Happy Hours: A Collection of Songs for Schools, Academies, and the Home Circle. By Edward Kingsbury and Alfred A. Graley. New York: Taintor Bros., No 698 Broadway.

A collection of music suitable for children, interspersed with pieces requiring some skill and culture in their execution. The words and the music seem equally chaste and carefully arranged. Both are of a high order. The collection is a good one, and will meet with great favor with teachers, pupils, and families.

Recent American and Foreign Patents.

Under this heading we shall publish weekly notes of some of the most important recent home and foreign patents.

Mill for Grinding Clay.—Levi Moore, Baraboo, Wis.—The object of this invention is to provide a mill for reducing clay to a pulverulent and plastic state, suitable for building brick or pottery. It consists of the form and arrangement of the grinding devices, the whole being contained within a frame adapted to their operation.

Fence.—Henry J. Culp, Goshen, Ind.—This invention relates to an improvement in fences, and consists in so constructing the panels of which the fence is composed that they can be readily connected and disconnected.

Sickle Bar for Mowing Machines.—G. W. Chapman, Jr., Iowa Falls, Iowa.—This invention relates to an improvement in the construction of sickle bars for mowers and reapers, and consists in forming the bars in two pieces, in such manner as to secure separate cutters or teeth between them, so that the teeth may be easily removed when necessary to sharpen and repair them, or replace any when broken.

Log Sled.—Chas. W. Mosher, East Leon, N. Y.—The object of this invention is to provide a log sled or boat with means to enable the logs to be taken on to the sled through the draft force exerted by the cattle hitched thereto. It consists of an angular or arched frame vibrating over trunnions, which latter have bearings on the sides or runners of the sled, or in suitable pieces of timber affixed thereto, together with a chain and log hooks so arranged that the draft force of the team will act to raise the log and draw it forward upon the sled.

Portable Clothes Rack.—Geo. H. Hammond, Davenport, N. Y.—The object of this invention is to provide a simple, durable, and portable rack for drying clothes. It consists of a central staff having two hubs affixed thereon, the said hubs being formed with jaws in which are provided folding arms and a jointed brace for holding the arms rigidly extended; the drying ropes are arranged at proper intervals on the arms, and the whole to set upon a post and revolve freely thereon.

Belt Tool.—Eben Hester, Suffield, Conn.—The object of this invention is to furnish a convenient tool for fitting belts for machinery. It consists of a square shank set in a handle and bearing two punches for cutting holes in the belt, and two punches having hollow or concave points for heading rivets It is also provided with a flat lacing awl having an eye for carrying the leather lacing strip.

Coupling for Sickle Pitmans.—O. P. Drury, Niles, Mich.—The object of this invention is to provide a strong, durable, and easily working coupling device for connecting the pitmans of a reaping or mowing machine with the sickle back of the same.

Lamp.—S. C. Brockington Groton, Conn.—The object of this invention is to construct a lamp for kerosene and other hydrocarbon liquids, in which the wick will always be equally far inserted in the liquid, so that thereby a steady and equal flame will always be obtained. The object of the invention is also to provide an oil reservoir and connections by means of which any number of lamps can be supplied with the necessary fuel.

Writing and Drawing Desk.—Wm. W. Levering, New York city.—This invention relates to a new desk, which is provided with slates, blackboards, and transparent ground glass plates, in such manner that they will be convenient for teachers, artists, and business men.

Fly Frame Flyer.—James S. Streeter, Providence, R. I.—This invention relates to a new and improved method of constructing flyers for the twisting of yarn, whereby the same are more economically made, and whereby the roving is more effectually prevented from flying out when running.

Rice Cultivator.—Geo. W. Cooper, Ogeechee, Ga.—This invention relates to a new rice cultivator, by which the ground between the drills is broken up, without throwing clods upon the plants, and without forming furrows and hills between the drills.

Sashes and Window Frames.—Johann Schnell, New York city.—This invention relates to a new manner of constructing window frames, with a view of facilitating the cleaning of the glass panes, the replacing of broken panes, and the repairing of broken sash cords. The invention consists in hanging the frame in which the sashes move up and down to the casing of the windows, so that it can be folded or turned like a folding window, and still be provided with sliding sashes.

Extension Wardrobe Frame.—Elias Gill, New York city.—The object of this invention is to construct a frame for a portable wardrobe, in such manner that the same may be freely and readily extended and contracted as to length and width, according to the room which it is intended it should occupy. The invention consists in connecting the four posts of the frame, which fit with their lower ends into slotted bars or beds, longitudinally as well as transversely, with toggle levers or slotted extension levers, or both, so that they can, longitudinally as well as transversely, be moved any desired distance apart.

Elastic Supports for Car Seat Backs.—Geo. Higginson, Newark, N. J.—This invention relates to a new device for supporting the arms of car seat backs and for receiving the shock when the same are reversed. The invention consists in the use of bolts or blocks which are resting upon spring or other cushions, and which are secured to the sides of the seat, so that the arms, to which the back is secured, may rest upon the upper ends of these elastic supports, and may, if the back, is reversed and suddenly let fall, find a yielding support.

Grate for Stoves and Furnaces.—A. J. Magoon, Providence, R. I.—This invention relates to a new grate for stoves, ranges, and furnaces, which is so arranged that it can at the same time serve as a grate and ash sifter. The grate is of circular form, and is at its center, by a vertical pin, pivoted in a horizontal shaft. On one side the grate is supported by a fixed lug, so that it cannot be dumped to that side. If by suitable gearing connection the grate is revolved around its vertical axis in one direction, it will simply obtain the said motion and will cause the coal held on it to be thoroughly shoved and sifted, but if revolved in the opposite direction, it will not be held by the lug and will swing around the horizontal axle and be dumped.

Ice Pitcher.—Thomas Leach, Taunton, Mass.—In this invention a detachable and removable lining, of glass, china, or earthen ware, is employed, and in connection with it a combined valve and filter of peculiar construction, together with a novel and convenient device for holding the lining firmly in the pitcher and at the same time preventing it from fracture by the sliding of the ice.

Machine for Disintegrating Cemented Gravel.—J. B. Cox, San Francisco, Cal.—This invention relates to an improved machine by means of which the compact gravel that abounds in and about the gold mines of California and elsewhere can be readily disintegrated, so that the gold which it contains may be separated from it.

Pocket Counter.—Jacob S. Detrick, San Francisco, Cal.—The object of this invention is to provide a neat and convenient pocket instrument by which the velocity of shafting, etc., can be accurately determined.

Manufacture of Brooms.—Robert F. Dobson, Goderich, Canada.—This invention relates to an improvement in the mode of securing the broom proper, or the corn to its handle, and it consists, first, in so fastening the broom corn that the free portion shall extend toward the upper end of the handle and then bending or turning the said corn back upon itself and there securing it.

Portable Fence.—Joseph W. Norman, Eugene, Ind.—In this invention the pickets are connected together by links, and each panel is so attached to its supporting posts that it can readily be detached and folded or rolled up, forming a compact and easily portable roll. The form of the posts is also new.

Screwdriver.—W. S. Goss, Baltimore, Md.—In this invention the handle is made of three pieces connected by clutches and stops in such a manner that its lower part can be turned continuously in either direction without releasing the hand from the upper part. In addition to this improvement, the blade is provided with an adjustable tool holder, which can be employed for holding gimlets, augers, awls, etc., while inserting them into or removing them from the wood