

**Hard Times and Drink.**

It is evident that hard times have contributed to a notable diminution in the use of all kinds of beverages, but particularly spirits. Possibly the bicycle has contributed to decrease the patronage of saloons, but, whatever the cause, the following official figures show that the consumption of alcoholic stimulants has not increased, while the use of the milder beverages has barely been steady.

**PER CAPITA CONSUMPTION OF LIQUORS.**

	Spirits, Gallons.	Wines, Gallons.	Beer, Gallons.	Total Gallons.
1896.....	1.00	0.26	15.10	16.42
1895.....	1.12	0.28	16.08	16.35
1894.....	1.33	0.31	15.18	16.82
1893.....	1.51	0.48	14.95	18.04
1892.....	1.50	0.44	15.16	17.04

These figures are surprising, in view of a reduction in the use of spirits from one and one-half gallons to one gallon per capita in five years. Naturally, under such circumstances, one looks for an increase in the use of the milder stimulants, but, instead, we find the use of wines has decreased from about one-half to one-quarter of a gallon per capita, while the use of beer has been stationary. Whereas during the five years, 1887 to 1892, it rose from 11.23 gallons in 1887 to 15.28 gallons in 1891, a period of marked prosperity. In 1896, 71,263,000 people used less spirits than 58,680,000 people did in 1887. About 11,000,000 gallons of spirits are used annually in the arts, manufactures and medicine, so that deducting that quantity leaves about 60,000,000 gallons for use as a beverage. Barrooms show an average of sixty drinks per gallon, returning about \$4.50, thus making the nation's whisky bill in 1896, as a beverage, \$270,000,000, while in 1892 and 1893 it averaged \$400,500,000. This decrease accounts for a big loss in revenue, officially reported in 1896 at nearly \$14,000,000 less than in 1893. Foreign spirits are in favor in fashionable circles, and yet the importations in 1896, while heavier than for the four preceding years, were lighter than in 1890 or 1891.

Beer disputes with coffee the claim to be the national beverage. Twenty years ago the per capita consumption of beer was less than one-half of what it is to-day, or six and one-half gallons, against fifteen gallons in 1896. During the prosperous years 1891 and 1893 the consumption reached its maximum, rising in 1893 to 16.08

gallons, since which date it has fallen off about one gallon per capita, averaging for the three years ending with 1896 fifteen gallons per capita annually. Hard times and bicycles explain this decrease in the use of malt liquors. On the basis of 50 cents per gallon for domestic beer and \$1 for imported beer, as the cost to the consumer, we have a total expense for that item in 1896 of \$541,963,348. It is very evident that Americans are not given to a free use of wines. The consumption of domestic wines in 1896 was less than one-half the quantity used in 1888, leaving out of question an increase in population of 12,583,000 people. Less imported wines are used than formerly. In 1883 the importations were more than double those in 1896, and over 1,500,000 gallons less than in 1893. The figures ought to encourage the friends of temperance, although they may be discouraging to the wine industry of the United States. Assuming that domestic wines cost the consumer \$2 per gallon, the nation's bill in 1896 for that item was \$29,199,514. The importations of that year were valued at the custom house (plus duties) at \$10,265,465. Allowing 100 per cent profit to distributors, the cost of foreign wines for the year 1896 was \$20,530,930, which, added to the cost of domestic wines, makes the nation's wine bill for 1896 \$49,730,444.

Bringing the above items of the cost of alcoholic beverages together, we have the following as the drink bill of the American people, so far as alcoholic stimulants are concerned: Beer (domestic), \$538,662,857; beer (imported), \$3,300,531; whisky (exclusive of quantity used in arts), \$270,000,000; wines (domestic) \$29,199,514; wines (imported), \$20,530,930; grand total, \$861,693,832; estimated cost in 1892 on the same basis, \$1,000,884,277; estimated cost in 1891 on the same basis, \$934,813,314. Is not the above full of encouragement to advocates of temperance? There is a wonderful decrease in the use of ardent spirits and wines and no gain in the use of beer. A comparison of the ten years' record indicates that good times foster the use of alcoholic stimulants. If we study the tables showing the consumption of non-alcoholic stimulants, we find the same conditions governing their use. Measured by the number of gallons of the beverage consumed, coffee ranks next to beer as a popular beverage. Assuming that one pound of coffee makes two gallons of infusion, we have a year's consumption of 962,088,692 gallons at a cost of

\$120,261,086. The per capita consumption of tea does not increase; in fact, is less than it was twenty-five years ago, when it averaged one and one-half pounds, against one and three-tenths pounds in 1896. The import cost of the tea received in 1896 was \$15,585,741. The retail cost was at least double this, or \$31,171,482. It is safe to say that one pound of tea as ordinarily brewed will make five gallons of beverage, on which basis there was in 1896 a total consumption of 466,701,240 gallons, costing 6½ cents per gallon, thus making tea the cheapest of all beverages in general use. The 1896 imports of crude cocoa, leaves and shells amounted to 23,276,597 pounds, valued at \$2,387,078. A large part of this is used for confectionery and other purposes than as a beverage, but it is safe to estimate that the retail cost of the chocolate and cocoa used as a beverage does not exceed \$3,000,000.

Bringing the above items into one group, we find that the United States consumed in 1896 alcoholic and non-alcoholic stimulants to the value of \$1,016,126,400, as follows: Alcoholic drinks, \$861,693,832; non-alcoholic stimulants—coffee, \$120,261,086; tea, \$31,171,482; cocoa, \$3,000,000; total, \$1,016,126,400. The above represents a yearly per capita expenditure for beverages of \$14.31 for the 71,000,000 inhabitants of the United States, or 4 cents per day. Evidently hard times have cut down the appetite for beverages of all kinds, and render distilleries hazardous industries. Breweries and coffee mills are far better property. The statistics above have been secured by The American Grocer.

**Necessity of Cover During Sleep.**

The object is simply this: Nature takes the time when one is lying down to give the heart rest, and that organ, consequently, makes ten strokes less a minute than when one is in an upright posture. Multiply that by sixty minutes and it is six hundred strokes. Therefore, in eight hours spent in lying down the heart is saved nearly five thousand strokes, and as the heart pumps six ounces of blood with each stroke, it lifts thirty thousand ounces less of blood in a night of eight hours spent in bed than when one is in an upright position. As the blood flows so much more slowly through the veins when one is lying down, one must supply then with extra coverings the warmth usually furnished by circulation.—Popular Science News.

**RECENTLY PATENTED INVENTIONS.****Engineering.****REVERSIBLE ROTARY ENGINE.**—

George W. Smith, Petersburg, Ill. The cylindrical body of this engine has sets of inlet channels arranged diametrically opposite each other, the abutments for each set being formed with angular ports, those of one set standing in an opposite direction to those of the other set. A piston turning in the cylinder has piston heads against which the motive agent acts, and a reversing valve connects either set of channels with the motive agent supply, so that by merely shifting the reversing lever the engine can be rotated in either direction. The engine is designed to be of simple and durable construction and very effective in operation.

**GAS ENGINE.**—Clinton Guyer, Muncy,

Pa. This invention provides a construction according to which the speed of the engine is fully under the control of an automatic governor, the engine taking only such charge of gas or gasoline as the work requires, and the gas and air being admitted in proper proportions. A combustion cylinder in which are sparking devices communicates with the piston cylinder, a mixing cylinder communicating with the combustion cylinder, and a gasoline container having a valve-controlled communication with the mixing cylinder. There is an air-controlling valve on the mixing cylinder and a valve-controlling shaft operated by the crank shaft, a cam on this shaft engaging a fulcrumed lever having connection with the valve in the gasoline container, there being means for regulating the throw of the valve.

**INCREASING EFFICIENCY OF COMPRESSED AIR.**—John McIntyre, Jersey City, N. J.

Instead of heating compressed air as heretofore, previous to its entering the motor, this invention provides an apparatus comprising a casing in which is a combustion chamber and a vapor chamber, both having their bottoms in free communication with a condensing liquid, there being a valved igniting chamber connected with the top of the combustion chamber, and the products of combustion passing through the liquid to reach the vapor chamber, an outlet pipe from which connects with the motor. The motive agent thus produced is of the same volume as the compressed air originally supplied, but its heat units and moisture are considerably increased at but slight expense for the oil or gas used.

**SAFETY STOP FOR HOISTING ENGINES.**

—James E. Richards, Calumet, Mich. In raising and lowering cages in mines, this invention provides a safety stop to automatically control the admission of the motive agent, the brake mechanism and the reversing lever, in case the speed of the engine is not checked before the cage reaches the landing. A screw rod on which travels a nut is driven from the engine in unison with the movement of the hoisting cable, and a tripping arm is adapted to be raised by the nut and moved in engagement with the governor or other movable part driven from the engine, the tripping arm controlling a device connected with the admission valve, the brake mechanism and the reversing lever.

**HOISTING APPARATUS.**—William J.

Webster, Oakdale, Pa. This is an improvement in apparatus for use in connection with the drilling of wells, there being a continuously driven shaft and means by which the hoisting drum may be readily thrown in and out of gear with the shaft. Two aligned shafts are ar-

ranged in stationary bearings, one of the shafts being slidable in its bearings, and clutch members are carried by the contiguous ends of the shafts, to be engaged and disengaged by the sliding movement of the slidable shaft. Means are provided for so sliding one shaft, and on this shaft and moving with it is a brake collar to engage one of the bearings upon the disengagement of the clutch members.

**GENERATOR.**—John O. Morris, Richmond, Va.

This is a device to be arranged in the ash pit door, to supply mixed steam and oxygen under the grate bars of the furnace. The entering flue has a funnel-shaped outer mouth through which a supply of air is drawn, and in one side of this funnel is a steam jet nozzle, while in the flue, in the rear of the nozzle, is a mixer, composed of wheels arranged to be acted on and turned by the steam. Three wind wheels are used in the flue, arranged in a manner to efficiently draw in the air and mix it with the steam to most effectively promote combustion.

**CONDENSER.**—Albert Hoberecht, En-

sauada, Mexico. For condensing the vapors from steam or other generators, this invention provides an apparatus in which the condensing chamber may have baffle plates, air circles and side draught flues, a vapor drum encircling a cold air pipe in the condenser proper, to which leads an air inlet pipe, while a vapor pipe leads from the drum into the air inlet pipe. A graduated siphon nozzle enables the operator to readily control and regulate the passage of vapor to the condenser proper, according to the pressure indicated by the gage or the discharged products of condensation.

**Railway Appliances.****REFRIGERATOR CAR.**—Andrew J. Mc-

Arthur, Gainesville, Fla. This car has an interior casing, affording air spaces at the top, bottom and sides, and arranged in the sides are woven wire ice receptacles to be filled from openings in the car roof. Coiled pipes have communication with the ice receptacles and siphon pipes connected with the coil pipes lead through the bottom of the car, drip pipes connected therewith being extended upward and downward. The arrangement is such that the pipes may be easily and quickly cleaned, while the cold air will be evenly distributed throughout the car, rendering it especially advantageous for the transportation of meats and other perishable articles.

**CAR COUPLING HOSE HANGER.**—Ben-

jamin S. McClellan, New Orleans, La. This invention relates to a former patented invention of the same inventor, providing for the holding in proper position of the coupling ends of the uncoupled hose, preventing it from kinking and cracking, and sealing the opening to exclude dirt, etc. A chain, connected to the under side of the car coupling, is attached to a clamp on the free end of the hose, and on the clamp are bearings for a bolt forming a pivot for a lever carrying a conically shaped valve adapted to engage a gasket in the open end of the coupling member when the latter is disengaged from the other member, whereby the coupling member will be automatically closed when the members are disengaged.

**Electrical.****TELEPHONE TRANSMITTER.**—David

A. Fleming, Indiana, Pa. According to this invention the

pressure upon the diaphragm and the distinctness of transmission are designed to be regulated with great nicety by a novel pressure or tension device. A tube or channel is mounted to turn adjacent to the diaphragm and inclined relatively to the axis of rotation, the tube being mounted to turn without affecting the fastening of the diaphragm, while loose conducting material, such as carbon or metallic balls, is placed in the channel to engage the diaphragm. The construction affords means of simple and ready adjustment for obtaining the required pressure on the diaphragm.

**POTENTIAL REGULATOR FOR DYN-**

amos.—Allen A. Tirrill, Whitefield, and Phill S. Tirrill,

Groveton, N. H. This governor provides for automatically regulating the voltage on the supply wires, to always maintain an even potential under the varying demand from the starting and stopping of motors or the throwing in or cutting out of electric lights, etc. It consists of two vertically arranged solenoids, the cores of which are loosely connected to each other and to a pair of levers, there being a spring for pulling down the inner ends of the levers, and two contact points, one carried by the levers and the other by an adjusting screw. The invention is distinguished by the means provided for balancing the solenoid core and adjusting the sensitiveness of the contacts of the field magnet shunt, which is very necessary to the automatic regulation of the potential.

**TROLLEY GUARD.**—Heriman J. Vogler

and Alfredo Flores, San Antonio, Texas. A pair of spring-held but yielding guards, according to this invention, is arranged one on each side of the trolley wheel, the guards being bowed or loop-shaped and hung on the axle of the trolley wheel. The guards hold the wheel on the wire but yield in passing under the cross supporting wires without damaging the latter. The guard may be used with the ordinary trolley pole, and works equally well in going either forward or backward.

**Bicycles, Etc.****AIR PROPELLED BICYCLE.**—David A.

Moore, Harvey, Ill. This wheel has no chain or other gear, the pedals being used to operate an air pump, the air compressed by which is conducted to a specially constructed rotary engine arranged about the center of the rear wheel. To each side of the frame, near the saddle, is pivoted the upper end of an air pump, a flexible tube from which leads to the motor, while the lower end of the piston rod, at its junction with the pedal, is jointed to a swinging arm which vibrates about a rear coupling pivoted to the frame, the pump cylinders also swinging about their pivotal connections with the frame at their upper ends.

**BICYCLE HANDLE BAR.**—Joseph D.

King, Menominee, Mich. To facilitate adjusting the handle bars of a machine to suit the convenience of the rider, and locking them in such position against accidental release and change, a construction is provided by this invention according to which an annulus at the upper end of the stem has interior locking teeth adapted to be engaged by dogs, in connection with a thimble and interior tube connected with the two handle bars, the dogs being attached to toggle links from which a connection extends to a spring-pressed thumb lever on one of the handle bars. The handle bars may be readily adjusted when the machine is in motion.

**BICYCLE TOE CLIP.**—Samuel Halligan,

Perth Amboy, N. J. This invention provides a pedal clip in which a body portion connected with the return section is weighted, there being means for conveniently adjusting the clip on the pedal. When the clip is in position on the pedal it automatically assumes and maintains a horizontal balanced position, enabling the rider to quickly locate the toe in the clip, and the entire device is simple and inexpensive.

**Mechanical.****RATCHET DRILL.**—Jacob Racich, New

York City. The mechanism of this drill is adapted to rotate the drill while the handle is being moved in either direction, and is of greater power than that ordinarily employed. An operating lever is pivoted at one side of the axis of the drill, double pawls being pivoted on opposite sides of the center line of the lever, threaded sleeves engaging the drill socket and a back pressure foot, and a toothed feed wheel being connected to the latter. A telescopic rod is connected to the handle and the back pressure foot, a slotted arm being carried by the outer section of the rod, and a pawl adjustably pivoted in the slot engages the feed wheel. The drill may be set at the feed desired, considerable variation in which is provided for.

**SAWING MACHINE.**—Anderson W.

Brown and James Meiklejohn, Rhinelander, Wis. These inventors have devised a machine designed for sawing down trees and for sawing the logs into desired lengths. The saw carrying frame is adapted to swing on the bearings for the operating shaft, which may be rotated by hand or other power, such shaft standing vertically to saw down a tree and the saw being formed of sprocket links constituting an endless saw passing over sprocket wheels carried by the frame. The saw being held horizontally, the forward run cuts into the tree, the feeding being effected by swinging the frame inward, while to cut a felled tree into lengths the frame is swung downward to bring the lower run of the saw into engagement with the log.

**SQUARE, PLUMB AND LEVEL.**—William

Moore, Long Island City, N. Y. This is a combination tool for the use of bricklayers and masons, the tool being so constructed that it is possible to use it upon work which is out of the perpendicular, for leveling purposes, it being provided that an arm may be projected from the body of the tool at any desired angle and held in the position to which it is adjusted, the arm, together with the body of the tool, when one is at right angles to the other, constituting a regular carpenter's square.

**PIPE COUPLING.**—Edward J. Mallen,

New York City. For pipes having flat sides, more especially, this coupling is designed to firmly connect the ends of the pipe sections to form a stiff airtight joint and give an ornamental appearance to the pipe. The invention consists principally of a strip of sheet metal having near its middle a pocket for the reception of a filling, preferably of wood, the ends of the strip being adapted to be engaged by the sides of the pipe and the inner sides of the pockets, which form receiving grooves for the ends of the pipe to be jointed.

**Miscellaneous.****LITHOGRAPHIC COLOR PRINTING.**—

Louis C. G. Lesage, Paris, France. In order to facilitate

the reproduction of pictures uniformly representing the exact colors and shades desired, the compound colors being produced by the superposition of primitive colors, when impressions are taken from two or three plates, this inventor has devised a novel color chart, in which the lithographer may always find the tones or shades of the design or sketch required, and a machine capable of preparing the plate in accordance with the chosen tones or shades. The electrically-controlled marking tool of the machine produces dots at regularly graduated distances from each other, the dots being more or less close together on the different stones, according to the shade desired to be produced by the different impressions, the shades being accurately determined by the chart, and the results being always certain and uniform.

MANUFACTURING CALCIUM ACETATE. -Martin F. Quinn, Straight, Pa. A simple apparatus by means of which the process of manufacture may be carried on at a comparatively small cost is provided by this inventor. It comprises a shell for the lime as received from the retort, the shell having a pitched roof with outlet for alcohol fumes, a trough at the junction of the walls and roof of the shell, a steam heating coil close to the inner surface of the side and end walls, and a steam jacket over the entire area of the bottom of the shell. The whole operation of separating alcohol from acetate of lime and preparing the lime for the kiln is completed in this one apparatus, thus saving handling, wastage and labor. The same inventor has obtained a further patent for a kiln for drying acetate of lime and making it ready for market. It has side and end walls, with troughs extended along the upper portions of the side walls, a trough or pipe receiving the discharge from the troughs, and a water spraying pipe extended along the apex of the roof, there being track rails in the kiln and steam heating pipes in its lower portion. With this construction lime once in the kiln may be quickly treated and placed upon cars without further work on the part of the attendant.

WHEELED VEHICLE.—Horatio B. Osgood, Binghamton, N. Y. To provide stronger and cheaper axles for heavy vehicles, such as trucks and skids, is the object of this invention, the vehicle being provided with a frame having projecting lugs, one face of each lug being convex, while the metal axles for the frame have in one end of each axle a depression formed by swaging to expand the end of the axle, the depressed and expanded ends of the axles being respectively cast into the lugs so that the axles will project perpendicularly from the convex faces of the lugs.

BARREL FILLING MACHINE.—Joseph E. J. Goodlett, Memphis, Tenn. This invention covers an improvement on a former patented invention of the same inventor, according to which a conducting tube with universal joint or coupling is attached to a valve and float mechanism attached to a gooseneck, the gooseneck and valve chamber being, according to the present invention, formed integrally and the valve chamber shortened, thus reducing the cost of manufacture. By providing a plug and shell or plug casing for each tank, the filler may be readily changed from one tank to another, thus saving time and labor as compared with filling apparatus having joints or couplings of ordinary construction.

PORTABLE FIRE EXTINGUISHER.—Clotilde F. B. Durand, Montreal, Canada. In extinguishers adapted to eject a saline solution by the pressure of a gas with which the extinguisher is charged, this invention provides a novel construction and arrangement of a lever in connection with the discharge nozzle and valve. The extinguisher is of glass, resembling an ordinary ginger ale bottle, with screw-threaded neck for the attachment of a metal head with lateral discharge nozzle, there being in the head a valve operated by a curved lever, which may be pulled back by the finger, the body of the extinguisher being held by the other hand.

CURTAIN ROLLER ATTACHMENT.—Martin L. Kullberg, Brooklyn, N. Y. This invention provides a superior curtain support comprising a pole with central bore, slotted radially, a plug having a knob at each end of the pole and a feather on each knob, the feathers fitting in the ends of the slot. Nails engage the plugs to hold the knobs in position, and a wire is secured to a cylindrical block slidable in the bore, the end portions of the wire extending through the slot, one end terminating with an eye and the other end having a spring-pin, the curtain being attached to the pin.

ADJUSTABLE SIGN AND FRAME.—Alvah C. Roebuck, Chicago, Ill. This is a device for use as a name plate or for other purposes, the frame being adapted to hold a long or short name or any reading matter required for display. The frame is simple, inexpensive, and may be applied to any surface, and consists of side pieces grooved on their inner edges, caps receiving the ends of the side pieces and engaging their grooves, each of the caps having a grooved projection on its inner face, while a back plate engages the grooves of the projections.

FISHING ROD REEL HOLDER.—Daniel L. Andrews, Webster, Mass. In this holder clamping bands are provided with adjustable clamps or tightening devices, in connection with a side adapted for attachment to a reel adjustably carried by the clamps, affording a rigid and firm contact between the reel holder and rod, and providing for an adjustment of the reel upon its holder and the adjustment of the holder upon a rod, so that when the holder is clamped upon a rod the reel will be simultaneously locked in position on the holder.

RAT AND MICE TRAP.—Theodore H. Bradish, Utica, N. Y. Instead of killing or imprisoning rats and mice, in what the inventor styles the present "cruel and inhuman" way, this trap is designed, when the animal enters the trap and approaches the bait, to release an elastic, held around the opening of the trap, the elastic then closing about the body of the rat. Attached to the elastic are bells and tufts of cotton or other material, painted or coated with phosphorescent material, etc., it being designed that the escaping rat shall thus effectually frighten away other rats.

NOTE.—Copies of any of the above patents will be furnished by Munn & Co. for 10 cents each. Please send name of the patentee, title of invention, and date of this paper.

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Notes & Queries

HINTS TO CORRESPONDENTS.

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(7318) F. S. G. asks: How many 5 x 7 Crowfoot gravity batteries should I use on a 350 feet long telegraph line with two 5 ohm instruments and ground return? Line made of No. 12 galvanized iron wire. A. Two cells should be sufficient for this line.

(7319) E. E. G. writes: I would like a little information in regard to the Mesco dry battery. 1. Is the dry battery considered to be as good as the liquid for operating small call bells? A. Dry cells are useful because of their cleanliness and convenience, but they do not generally give as strong a current as a wet cell of the same materials. 2. How many cells of dry battery are required to ring a 4 inch bell through 100 feet of No. 18 wire? A. It would be advisable to use two cells, though one fresh cell would probably ring the bell. 3. What do you consider is the best liquid battery, the cheapest to keep running, the least liable to get out of order, of the open circuit kind? A. There are many forms of Leclanche cells about equally good. 4. How long will the dry battery last with ordinary usage on a call bell? A. Many months. 5. Please give me the number of cells required to ring the different sizes of bells, that is, from 2 1/2 inches to 6 inches? A. The size of the bell has nothing to do with the question. The resistance of the wire in the electromagnet is the quantity to be considered. 6. Does it make any difference in regard to the number of feet of wire used, that is, if I use more wire, will it require more cells of battery? A. Yes. 7. I intend to build a telephone line one mile in length to use three instruments; as I am not very well posted in the telephone business, do not hardly know what I want. What size wire shall I need? Will No. 14 be large enough? A. Use No. 12 galvanized iron wire. 8. Could I not have the call bell on the telephones work with a push button? A. Yes. 9. How many cells of battery will be required? A. Two at each end. See Lockwood's "Practical Information for 'Telephonists,'" price \$1 by mail.

(7320) C. D. W. asks (1) how large a storage battery it would require to maintain a current sufficient to run seven 16 candle power incandescent lamps at 110 volts for 6 hours. A. 55 cells in series will give the voltage required. The seven lamps require about 3 3/4 amperes. This will be given by type C of the chloride cells, with 7 plates per cell, each 4 x 4 1/2. They will discharge at this rate for ten hours. 2. Could this battery be charged through the same transformers as are used for the house circuit? A. No. A direct current must be used to charge them. 3. How long and how many watts would it take to charge the above? A. The time required for recharging depends on the amperes used at 110 volts. The ampere hours of the cell are 37 1/2. If 10 amperes are used in recharging, it would require 3 3/4 hours.

(7321) McL. P. says: A peddler recently passed through our city selling a compound of such a nature that when it was applied to a newspaper cut, colored or black, and a clean piece of paper placed upon it and heat or friction applied, the cut would be faithfully transferred to the clean paper. The compound had the appearance of an emulsion, being milk white and smelled strongly of turpentine. Can you give us its formula? A. Information on this subject, also formulas for the preparations for effecting the transfers are contained in SUPPLEMENT, Nos. 1062, 1122 and 1141, price 10 cents each by mail.

(7322) J. J. W. asks: Will you kindly inform me through your Notes and Queries of the SCIENTIFIC AMERICAN how to make a good black indelible ink, such as is used in marking and designing on linen and other goods and such that will not spread? A. See formula in SUPPLEMENT, No. 1121, price 10 cents by mail.

(7323) J. M. R. writes: Please inform me through your Notes and Queries how to make black ink like that sold in all stationery stores. A. See formulas in SUPPLEMENT, Nos. 157, 1119 and 1139, price 10 cents by mail.

(7324) A. W. B. asks for a formula for a roach food—one that will kill or drive away the roach and be absolutely harmless to human beings. The reason I want a roach food that kills is this: I have tried the various insect powders on the market, with no good results. A. Some years ago we analyzed a commercial roach food, and found it was composed of 90 per cent. borax and 10 per cent corn starch. The powder was colored with a little carmine. This is considered to make a very efficacious roach food. It would not be poisonous to a human being.

(7325) W. R., Eureka, Cal., asks: 1. Which bullet travels through more space—that fired perpendicularly upward, ascent and descent both included as distance traveled; or, one fired at any acute angle of elevation? A. A ball fired at 45° elevation is supposed to have the longest trajectory. 2. By which of the six mechanical powers can the same power overcome the greatest weight or resistance? A. The usually termed mechanical powers are the lever, the inclined plane, the screw, the wheel and axle, the wedge and the pulley. The one that has the least friction is the most efficient. This applies to the lever.

NEW BOOKS, ETC.

MECHANICAL DRAFT. A practical treatise. Boston, Mass.: B. F. Sturtevant. 1898. Pp. 385.

The subject of mechanical draught has been discussed at greater or less length in the technical press and before various engineering societies, but in all cases such discussion has been distinctly limited. Here for the first time the attempt is made to give the treatment its importance demands. Although its introduction is an evidence of a somewhat radical departure in certain features of boiler practice, yet extended and recent experience clearly indicates the permanence of this departure. Though published by a firm which has been prominently before the engineering world for many years as manufacturers of fans and blowers, still the work will prove of great value to all mechanical engineers, as it is filled with data and is well illustrated by diagrams and engravings, many of the latter being from plans which are in actual use.

THE TRAINING OF A CRAFTSMAN. By Fred Miller. New York: Truslove & Comba. 1898. Pp. 249, 161 illustrations. Price \$2.

This book is the outcome of a series of articles contributed to the Art Journal. The author's object is to bring to the notice of the reader, through the medium of illustrations, the work of some few representative craftsmen, with a few personal notes, the results of conversations with the craftsmen themselves, and also a general survey of the work being done to-day in some of the leading crafts. "Crafts" is an ugly word, but it is a very expressive one, and the beautiful examples of modern work which are given in the present book indicate what is now being done by workers who apply art to industry.

A SYSTEM OF EASY LETTERING. By J. Howard Cromwell, Ph. B. New York: Spon & Chamberlain. 1897. Pp. 68. Price 50 cents.

This is an admirable system of lettering, drawings and signs. We have but to divide any surface which we may wish to letter into squares or parallelograms, as the case may be, in pencil lines; form the required letters in ink or paint according to the style chosen, then erase the pencil lines, and the lettering is complete.

SUGGESTIONS FOR LABORATORY AND FIELD WORK IN HIGH SCHOOL GEOLOGY. Questions for use with Tarr's Elementary Geology. By Ralph S. Tarr. New York: The Macmillan Company. 1897. Pp. 100. Price 25 cents.

This little pamphlet gives valuable advice to the professor of geology as to taking students out on field expeditions and for work in the laboratory. It also contains questions for use with Tarr's Elementary Geology.

THE ROAD TO PROSPERITY. A treatise on political economy. Written upon various subjects, with a view of aiding in creating permanent prosperity and contentment of the people. By T. W. Wood. Chicago: Charles H. Kerr & Company. 1898. Pp. 78. Price 25 cents.

UNITED STATES DEPARTMENT OF AGRICULTURE. Weather Bureau Bulletin E. Floods of the Mississippi River. By Park Morrill. Washington. 1897. Pp. 58.

The present work attests the great value and thoroughness of the work accomplished by the Weather Bureau with the crippled means at their disposal, to which we have already referred. The large pamphlet is filled with interesting matter relating to the drainage basin of the Mississippi River, both under normal and flood conditions. The floods occurring during the past twenty-six years are made the chief subject of study, inasmuch as only during that time complete and reliable gage readings were available. Six notable flood years are included in this period, and for these six flood hydrographs have been drawn for several typical stations. The downflow of water from which each flood arose has been computed and the results are given in tabular form. The 58 maps and charts are well executed.

STEWART'S TELEGRAPHIC CODE. By means of which any number, from one to a million, can be expressed by a single word of not more than ten letters. By Charles Stewart. Saint Paul. 1897. Pp. 22. Price 25 cents.

This little book gives a convenient system for transmitting numbers by telegraph, and will undoubtedly prove useful to those who use telegraph codes.

MATHEMATICS. LOGARITHMS: THEIR NATURE, COMPUTATION AND USES, WITH LOGARITHMIC TABLES OF NUMBERS AND CIRCULAR FUNCTIONS TO TEN PLACES OF DECIMALS. By W. W. Duffield, Superintendent, Treasury Department, U. S. Coast and Geodetic Survey. Part 1. Appendix No. 12. Report for 1896. Washington. 1897. Pp. 327.

The present work, by the late superintendent of the United States Coast and Geodetic Survey, has been very severely criticised by the lay and scientific press. The tables will prove very useful to those who do not have access to Baron Von Vega's work on the same subject. The latter work has been corrected of all known errors, and it was reproduced in 1889, in Florence, Italy, by photo-zincography, which avoided the introduction of any more typographical errors.

A MANUAL OF MENTAL SCIENCE FOR TEACHERS AND PUPILS. Childhood: Its Character and Culture. By Jessie A. Fowler. New York: Fowler & Wells Company. Pp. 235. Price \$1.

MIT SCHLÄGEL UND EISEN. By Dr. Wilhelm Bersch. Vienna, Pesth and Leipzig: A. Hartleben. Twenty-five parts of 32 pages each, at the price of 30 kr. (15 cents) per part, or \$3.75 for the whole work.

It presents, in a popular way, all the subjects that pertain to mines and mining, such as geology, mineralogy, constructions, tools and machines used in mining, and the methods and apparatus for treating ores and other mining products. The book is illustrated by more than 300 cuts and 26 full page engravings. The paper, type and general get-up of the work are excellent, and the book will be similar in size and style to the popular works on electricity, railway construction and general scientific subjects issued by the same publishers.

We have received the Christmas number of the Northwestern Miller, and it is a remarkable specimen of trade journalism. The cover of the number is embossed in imitation of old ivory, representing Don Quixote making his fierce attack on the windmill of the Manchan plain. There is a colored frontispiece showing milling among the cliff dwellers of Arizona. Various articles in the number are contributed by such writers as Mary Halleck Foote, Octave Thanet, Bill Nye, Edward Everett Hale and others. Many of the illustrations are in color and the half-tones are superbly printed. There is also a map showing the winter and spring wheat sections of the United States, with valuable statistics. The holiday number is mailed by the publishers, from Minneapolis, for fifty cents.

TO INVENTORS.

An experience of nearly fifty years, and the preparation of more than one hundred thousand applications for patents at home and abroad, enable us to understand the laws and practice on both continents, and to possess unequaled facilities for procuring patents everywhere. A synopsis of the patent laws of the United States and all foreign countries may be had on application, and persons contemplating the securing of patents, either at home or abroad, are invited to write to this office for prices, which are low, in accordance with the times and our extensive facilities for conducting the business. Address MUNN & CO., office SCIENTIFIC AMERICAN, 361 Broadway, New York.

INDEX OF INVENTIONS

For which Letters Patent of the United States were Granted

JANUARY 11, 1898,

AND EACH BEARING THAT DATE.

(See note at end of list about copies of these patents.)

Table listing various inventions and their patent numbers, including items like Advertising vehicle, Air brake, Alarm, Ammonium nitrate, and many others.

(Continued on page 62)