

J. W. H. asks: If the exhaust steam from an engine contains 1/4 of the entire units of heat used in generating it, would it not be practical and economical to pump it back into the boiler? Is this idea new or old? A. The idea is neither novel nor good.

G. F. R. asks: How can I bend brass tubing without injury to the tube? A. Fill the tube with resin or with lead, before bending, and melt the same out after the bending is completed. Lead is the best.

H. Z. E. asks: 1. What is an accurate second of time, and how is it determined? A. 1. You will find table below, upon which to base your calculations. 2. Is it a natural, or artificial unit of measure? A. 2. Artificial. 3. What proportion does the ordinary yard bear to the length of a pendulum beating seconds? A. 3. The length of the seconds pendulum—that is to say, of the pendulum which makes one oscillation per second—varies, of course, with the intensity of gravity; at the level of the sea it is, according to Sabine: 39.02074 inches at the equator (St. Thomas), 39.13983 inches at London, and 39.21469 inches at Spitzbergen.

What is meant by the molecular theory of matter? A. The molecule is the smallest quantity of any elementary substance which is capable of existing in a separate form. H, for instance, represents the atom of hydrogen, while H<sub>2</sub>, or H<sub>2</sub>, indicates its molecule.

How does the greenback paper dollar compare with specie, as a measure of value? A. Specie is worth about 9 1/2 cents more on the dollar than paper, but its comparative value is constantly varying.

W. S. P. asks: Has the hatching of hen's eggs by artificial heat ever been a success? If so, when, where, and by what process? A. Artificial incubation is considerably practiced. You may see the apparatus in operation at agricultural and industrial exhibitions.

F. B.—For cleaning the ink (containing iron) from your blanks, try a strong solution of caustic potash.

W. B. asks: How much does pure water weigh to the cubic foot? A. Pure water weighs 1,000 ounces per cubic foot.

Will not water drive an engine as well as steam or compressed air, if supplied through a suitable pipe from a reservoir 50 feet above the engine? A. Water will drive an engine, but not so well as steam or compressed air, because of the difficulty of getting the water into and out from the cylinder with sufficient rapidity. Power from water is best utilized by means of a water wheel.

I propose to use a friction arrangement, consisting of a smooth bar, with a dog on each side to clamp the bar, and to have springs to keep the dogs on the bar. Will it work accurately? A. Your friction arrangement would, if the springs were powerful enough, drive the bar; but it would be liable to spring the bar out of true, if one spring were more rigid than the other, as is very likely to be the case.

I have an attachment for lathes by which the speed of tool travel can be changed without stopping the lathe, and can be changed from any one feed to any other in 15 seconds. It is very simple in its construction. There are two shaves running lengthways of the lathe bed, each having a number of wheels, running from large to small, on the back, on which they are keyed fast, while on the front one they are not keyed. They are thrown into action by means of a gear clamp. The clamp is made double (so as to work both ways), the levers of which (when out of motion) rest in the middle one of three notches; and when in the left hand notch, the feed is, say, 20 to the inch, while, when in the right, it will be, say, 18 to the inch. The front shaft imparts motion to the feed screw, and the back receives its motion from the main spindle, and it can be attached to any lathe. Do you think it is of any value? A. It would be highly advantageous to be able to alter quickly the feed of a lathe tool by a simple contrivance, especially in lathes whose screw serves the purpose of tool feeding as well as screw cutting. A moderate range of tool feed is, however, obtained in lathes having an independent tool feed by simply shifting the belt on the cone which drives the tool feed spindle. We are not prepared from your description to speak decisively of your arrangement, but should judge that a wide range of alteration in tool travel could be easily obtained by it.

M. A. G., in answer to several inquiries about keeping water pure in cisterns: Wooden or other cisterns constructed to receive rain water from the roof of buildings, as generally made, soon become foul, with sediment, smoke, and other impurities from the roof. In a short time the water becomes stagnant, and unpleasantly odorous. To remedy this, carry the pipe which brings the water into the cistern to within two or three inches of the bottom, thus discharging the fresh water at the bottom, and causing an entire change of water every time it rains. Then there ought to be an opening or valve of some sort at the bottom, by which you can drain out all the contents, and thoroughly rinse and scrub the inside as occasion may require. An auger hole and plug placed as to be easily accessible would answer the purpose. Such a cistern placed under a woodhouse, or in some secure place out of the reach of frost, with the outlets arranged to be reached from the cellar, and discharging the surplus water into the cellar drain, and a pipe to connect with a pump in the kitchen, will be a wonderful convenience in places where soft water is not easily obtained. I constructed one which has proved very satisfactory after six years' use, in the following manner: About four or five feet outside the cellar, and under a wing of the house, I dug down nearly to the depth of the cellar, and of the required size, say six or eight feet. The ground was a very solid clay, except the surface soil of about 18 inches. This upper portion, in the soft soil, we dug larger, perhaps a foot or more all round. In this portion I laid a stone wall in lime mortar, so that the inside was even with the lower portion of the cistern; I then placed a piece of iron pipe from the bottom of the cistern through the earth, into the inside of the cellar, with the end opening over the cellar drain, wedging the pipe in firmly with small stones and cement, and closing the cellar with a wooden plug. I then plastered the entire inner surface of bottom and side (laying a flat stone in the center to stand upon) with the cement called water lime, mixed with sand; putting on two coats and allowing time to dry; afterwards I put on a coat of clear cement very thin, with a brush, to close any little checks caused in drying. The house was then built over it. The rooms were warm and frost never troubled, and through a man hole in the floor we could go down, and with a broom thoroughly clean the inside, thus at all times having a full supply of water for all household purposes. To illustrate the importance of conveying the incoming water to the bottom, spoken of above, I note the case of a glass aquarium with a fountain in the center, which, though supplied with running water through the fountain, in a few weeks became offensive in odor, and the fish died. We then had a pipe put on conveying a portion of the water into the aquarium at the bottom, which did not interfere with the appearance or efficiency of the fountain, but caused a continuous change of water; and we had no further trouble.

D. says: In answer to several of your correspondents who wish to know how to make rubber hand stamps: Vulcanized rubber used, as prepared by the manufacturers, and can be procured in strips about 8 inches wide and about 1/4 of an inch thick, and of any desired length. The name and address should be set up in common printing type, and the type well oiled; a rim about 1/4 inch in height should be placed around the form, and dentist's plaster, mixed to the proper consistency, poured in and allowed to set; then the plaster cast is separated from the type. A piece of the soft vulcanized rubber is then cut of the size of the plaster mold and laid upon it, and both together are placed in a screw press, and heat sufficient to thoroughly soften the rubber is applied. The screw is then turned down hard and left for a short time until the rubber is perfectly forced into the mold. After the whole is cold, the rubber is separated from the model, and any irregularities trimmed off with a sharp knife; the rubber stereotype is then fastened, with glue or other cement, to a block of wood, and the stamp is ready for use.

H. R. C. sends a description of an improvement upon a leg supporter: On p. 250 of your vol. 80, in answer to "Sufferer," Dr. Chapman, of New Haven, Conn., says: A stiff and straight iron rod, flattened at each end and padded, of the length of the leg, is fastened to the outside of the leg." Now it seems to me this arrangement would be uncomfortable to wear, inasmuch as it does not allow of a free use of the knee joint. I have made a support for a number of parties which works admirably. The support is made entirely of steel except the heel covering, which is made of brass fitted to the heel. The bands placed behind the limb are three in number, covered with calfskin, and lined over a padding of thick beaver cloth with soft sheepskin. These three pieces are stitched together and extended far enough to go around the leg, where they are fastened by metal strips which button on small steel knobs.

MINERALS, ETC.—Specimens have been received from the following correspondents, and examined with the results stated:

H. W. S.—We are unable to decide what the plant is, from the flower. To analyze a plant, we must have stem, leaf, and flower, and sometimes it is necessary to have the roots also. There is no plant, to our knowledge, that is called the Thousand Dollar Plant, either in this country or in Europe. It is doubtful if the plant growing so abundantly in Texas would grow in the colder climate of Germany.—A. J. H.—It is a specimen of iron ore, containing a large percentage of silica.

J. M. K. asks: Can you tell me of the best treatment for asthma by inhalation?—A. M. G. asks: Can you give me a recipe for cleaning an oil painting from particles of paper, etc., that are stuck to it?—L. H. R. asks: What size should I make the steamports of a cylinder 1 1/2 inches diameter x 1 1/2 inches stroke, to be driven at as high a rate of speed as possible, by an upright cylindrical boiler without any flues (10 inches in diameter x 12 inches high), capable of carrying 80 or 40 lbs. steam?—J. E. W. says: I have a great deal of trouble in obtaining a good light upon my work when engraving on bright surfaces. The reflections are so great at times as to render it difficult to follow the tracings with the graver. I have used shades of various kinds, but find no relief. What will remedy the difficulty?—A. C. F. asks: 1. With what can I size some fancy paper articles for varnishing, the paste of which would be dissolved by the common size? 2. What varnish is best for such articles? It should be nearly transparent, and not readily soluble.—S. M. T. asks: Who made the first cast iron plows used in America, and in what year were they made?—G. W. asks: What kind of varnish would be the cheapest, besides possessing strong adhesive and entirely waterproof qualities, with which to coat paper and not penetrate said paper but very slightly?

COMMUNICATIONS RECEIVED.

The Editor of the SCIENTIFIC AMERICAN acknowledges, with much pleasure, the receipt of original papers and contributions upon the followingsubjects:

- On the Tides of Lakes. By L. L.
On a Mercurial Telescope. By H. S.
On Car Ventilation. Ry S.
On a Chemical Coquette. By S. H. T.
On Worn Out Clay Soils. By G. V.
On the Influence of the Pole Star. By P. H.
On the Alcohol Question. By Z. C. W.

Also enquiries and answers from the following: C. M. D.—G. W. W.—H. C. A.—S. H.—L. C. J.—R. H. N. J. O. R.—B. G.—A. H. F.—C. I. A.—H. R. C.

HINTS TO CORRESPONDENTS.

Correspondents whose inquiries fail to appear should repeat them. If not then published, they may conclude that, for good reasons, the Editor declines them. The address of the writer should always be given.

Enquiries relating to patents, or to the patentability of inventions, assignments, etc., will not be published here. All such questions, when initials only are given, are thrown into the waste basket, as it would fill half of our paper to print them all; but we generally take pleasure in answering briefly by mail, if the writer's address is given.

Hundreds of enquiries analogous to the following are sent: "Please to inform me where I can buy sheet lead, and the price? Where can I purchase a good brick machine? Whose steam engine and boiler would you recommend? Which churn is considered the best? Who makes the best mucilage? Where can I buy the best style of windmills?" All such personal enquiries are printed, as will be observed, in the column of "Business and Personal," which is specially set apart for that purpose, subject to the charge mentioned at the head of that column. Almost any desired information can in this way be expeditiously obtained.

[OFFICIAL.]
Index of Inventions
FOR WHICH
Letters Patent of the United States
WERE GRANTED IN THE WEEK ENDING
August 4, 1874,
AND EACH BEARING THAT DATE.
(Those marked (r) are reissued patents.)

Table listing inventions and their patent numbers, including items like 'Adding machine, C. J. Holman', 'Alarm, burglar, A. Nevlng', 'Amalgamating apparatus, A. L. Nolf', etc.

Table listing inventions and their patent numbers, including items like 'Lock, seal, T. J. Craft', 'Locks, seal, Foote and Randall', 'Locomotive whistles, operating, H. Wise', etc.

APPLICATIONS FOR EXTENSIONS.

Applications have been duly filed and are now pending for the extension of the following Letters Patent. Hearings upon the respective applications are appointed for the days hereinafter mentioned: 30,633.—FIRE ESCAPE.—E. B. Larcher. Oct. 28. 30,745.—CULTIVATOR.—N. Messenger. Nov. 11.

EXTENSIONS GRANTED.

29,490.—MILL.—C. B. Hutchinson. 29,500.—BLANK ROLLING MACHINE.—N. C. Lewis. 29,502.—PIANOFORTE.—H. Lindeman. 29,510.—CAR FLOOR, ETC.—R. Montgomery. 29,523.—CAMERA.—A. Semmenger. 29,534.—LATHES.—B. D. Whitney. 29,551, 29,562.—BOOTS AND SHOES.—L. R. Blake. 29,576.—ENGINE PISTON.—H. D. Dunbar. 29,579.—ENGINE GOVERNOR.—R. W. Gardner. 29,593, 29,594.—REAPER AND MOWER.—A. A. Henderson. 29,648.—SEWING MACHINE NEEDLE.—F. H. Drake.

DISCLAIMER.

29,579.—ENGINE GOVERNOR.—R. W. Gardner.

DESIGNS PATENTED.

7,602.—HEATER.—J. B. Bener, Philadelphia, Pa. 7,603.—CALENDAR.—W. A. Emerson, Providence, R. I. 7,604.—VASE.—J. W. Fiske, New York city. 7,605.—PEDIESTAL.—J. W. Fiske, New York city. 7,606.—BOTTLE.—A. Gruning, New York city. 7,607.—COOK STOVE.—C. Noble, Philadelphia, Pa.