



INSCRIPTIONS ON GLASS

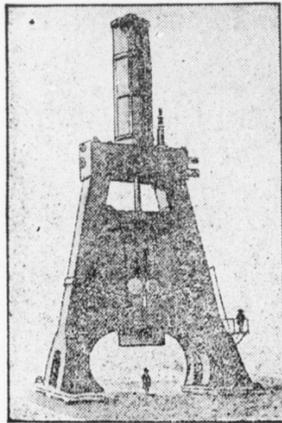
Hand Blast Method, as Here Described, Can Be Used with Some Success by Amateurs.

There are several methods for inscribing words, letters or decorative designs on glass. One calls for chemicals, and is a rather dangerous process. Another uses the sand blast—a jet of sand discharged at the glass object through a shield of paper, pasted thereon and pieced with the pattern. A close resemblance to the latter plan for the use of amateurs is described by the Jewelers' Circular-Weekly. It is available only for flat plates, not dishes. The design is drawn on white paper and then cut out. The paper must be pasted onto the glass neatly and snugly, so that there will be no air holes, loose places, or shreds overhanging the pattern. The plate is next fastened temporarily in the bottom of a wooden box, with the inscription upward. Now dump in a lake of emery powder and shot, and shake vigorously. In accordance with the fineness of the engraving wanted, fire or rough emery or shot are used. By shaking the box well in all directions, the emery particles will soon adhere to the shot and settle into it, as if they were driven in purposely. The sharp points of the shot, thus prepared, combined with the rest of the emery, cut into the glass by the continued shaking of the box, and the engraving will ere long appear. When sufficiently engraved the plate is removed from the box and the paper pattern washed off. Stars, leaves, scrolls and lettering can be engraved in this manner. Some parts, needing not as deep a cutting as others, might be covered with a shellac solution. This method is very simple and economical, and will, without doubt, be appreciated by every person of artistic taste.

BIG STEAM HAMMER.

The Hydraulic Press Has Completely Supplanted This Mighty Piece of Machinery.

What is believed to be the biggest steam hammer in the world is that which was set up ten years ago in South Bethlehem, Pa., and weighs 125 tons. This has been something of a disappointment, and of late has been used but very little. Indeed, so much better results can be secured in forging with hydraulic presses, that the giant hammer is now being demolished and removed. Engineering News, which makes this announcement, explains the step in the following manner: "It was found that in the forging of large masses of metal by blows from a hammer, even though the ram weighed 125 tons, some undesirable effects were produced. As a definite amount of time is required for the molecules of the metal to flow, the action of the blow was so rapid that the compression could not distribute itself uniformly through the mass; as a result, the out-



THE BIG STEAM HAMMER.

side of the forging was worked and stretched while the inside remained practically unchanged. Internal stresses were thus set up, and there was a tendency for the formation of flaws in the interior. Especially was this true of shafts for steam engines, which were one of the important products of the great forging plant. With the hydraulic press, on the other hand, the force is applied slowly and is as strong at the end of the stroke as at the beginning, so that a forging is made absolutely homogeneous, the interior of the piece being as thoroughly and effectively worked as the exterior. Besides this, the press is a more convenient tool to operate and maintain than the hammer.

"At the time of his construction the Bethlehem hammer was by far the largest and heaviest in the world, and we believe it has never been surpassed in this respect. Briefly described, it was a vertical single acting steam engine with a heavy ram attached to the piston rod. Steam admitted below the piston raised the ram, and its fall produced the desired blow. The steam cylinder had a bore of 76 inches, and the piston had a normal stroke of about 16 feet, which could be increased to nearly 20 feet. The total weight of the moving mass—piston, piston rod and ram—was 125 tons. The working steam pressure was 120 pounds per square inch. The hammer stood about 90 feet above the ground and measured 80 feet across at its base."

HARNESSES THE SUN.

Chicago Inventor Has Succeeded in Substituting Heat Rays for Soldering Metals.

The sun has been made to perform a new work by an ingenious Chicago man. He has hit upon the idea of substituting the sun's rays for the iron used in soldering metal. J. B. Merkel is the inventor of this new process. Mr. Merkel's soldering outfit is as simple as the methods he employs in uniting different pieces of metal. It consists of a large and powerful burning glass and a stick of specially prepared solder. With these he has been able to make "joints" as firm as those turned out of any hardware shop with the aid of irons and heating pots.

Every one probably has at some time or other been the victim of the perpetrator of the time-worn joke, in which the sun's rays are concentrated in a convex glass and focused on the hand or neck, and those who have been through this ordeal know the amount of heat that can be generated in this way. They learn this from the burning sensation accompanying the joke. It is this general principal that Mr.



SOLDERING BY SUNLIGHT.

Merkel follows in soldering by means of the sun's rays.

The burning glass takes the place of the soldering iron or tube in his novel process. The sun's rays are concentrated in the glass and then are focused at a fine point on the end of the stick of solder. The adhesive material melts, and, falling on the two pieces of metal unites them as firmly as under the old method.

Ordinary solder does not fulfill the requirements of the experiment because it is so hard that it resists heat of the intensity of that generated by the sun's rays through the glass. A special soft composition made of pure zinc, lead, and bismuth in certain proportions, is an essential feature of this simple soldering process. A special acid must also be prepared to aid in the work. This is made of carbolic acid in which has been dissolved to saturation a certain quantity of zinc, with a prescribed proportion of phosphoric acid and spirits of wine.

This method of soldering can be employed to make connection on electric wires, to join small particles of metal in the watchmaker's and jeweler's trade wherever direct heat is likely to take out temper or burn precious stones. In the use of the burning glass only a small spot is heated, leaving the adjacent part unaffected. This is exceedingly desirable in certain lines of work, and the joints made in this way are as solid and durable as any.

There are, however, two positive drawbacks to the sun process of soldering. One is that the solder placed in this way softens and dislocates in contact with water or when brought into contact with a higher temperature. But the chief drawback is that the sun's rays are not always available, and without their aid the work cannot be carried on.—Chicago Tribune.

BANANA RIVALS WHEAT.

It is Twenty-Five Times as Nutritious as the Given Weight of the American Cereal.

Science again brings a new paradox to the front. It concerns the staple food supply of half the entire human race—wheat. Long before the discovery of the Chaldean ovens, ages before Tyre's bread, man grew wheat, ground and baked it for his daily sustenance. To-day science affirms that wheat as a general food product is doomed; that not only is the supply entirely inadequate for the maintenance of the increasing races, but that wheat has by no means the highly nutritive qualities that it has long been supposed to offer to hungry humanity, and that—mirabile dictu!—the unappetizing, yellow skinned, finger shaped, despised banana of the tropics promises utterly to supplant it in the estimation of the world.

Not only that the banana is 25 times as nutritious as the given weight of wheat, but that it is 44 times as prolific. Thus fruit conquers over the cereal, Honduras over South Dakota, and famine promises to be forever banished from the face of the earth.

The average cost of cultivating an acre of wheat in the United States is about \$12. An acre of bananas can be cultivated at the same cost, with a yield 144 times greater than that of wheat. Bananas have 44 times the nutriment of potatoes, the staple of many northern countries of Europe, and 30 times that of rice, the main item on the daily board of more than a billion people on the globe. With transportation facilities perfected, such heart-rending scenes of famine as have been witnessed in India, Russia and elsewhere would be made impossible.—N Y Herald.



FOR HANDLING STONE.

How an Excellent Barrow Can Be Made at Home at a Merely Nominal Expense.

The illustration (Fig. 1) shows a contrivance which will be found useful for handling stone or for moving other heavy or bulky material to which the ordinary wheelbarrow is not adapted. A ready-made stone-barrow costs three dollars, but the one illustrated can be made by the farmer himself, and besides the material will cost nothing but the work and a few cents for the blacksmith's services, if they are required. Use two pieces of 2x3-inch hardwood stuff 3 1/2 to 4 feet long for the main parts of the framework. At one

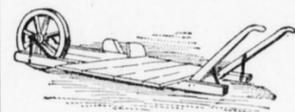


Fig. 1. HOMEMADE STONE BARROW.

end hang a solid old barrow wheel, with bearings of strap iron so as to have two or three inches of the wheel below the frame pieces. At the other end, bolt handles such as may be obtained from an old cultivator or shovel plow. The handles are bent out to the required position and held in place by a simple iron brace to strengthen both the frame and the handles. The handles should not be elevated too much at the ends, but be low and long enough to give sufficient leverage when lifting the barrow. Put on a floor of hard wood boards about 1 1/2 inches thick, making it, say, two feet wide and 25 to 27 inches long, and at the front arrange a sloping board behind the wheel. This board is held by screws or nails to a block attached outside of each



Fig. 2. STRONGER, BUT HARDER TO MAKE.

2x3-inch frame piece; in the cut it is partially represented by a dotted line, and but one of the blocks that hold it is shown. The 2x3's may be placed as far apart as the length of the hub and axle of the wheel will allow. Screws or nails may be used to hold the flooring, and the durability of the bed will be increased if two or three flat iron strips, drilled with holes for the screws or nails, are used as washers, running the full length of bed and up on the front board. In Fig. 2 another kind of frame is shown, which is stronger but more difficult to make. Four 2x3-inch pieces are used, and they are braced together with a 2x3 and 3x1 1/2 crosspiece. The two middle frame pieces are mortised with 2x1-inch tenons into the rear crosspiece, and the crosspiece is mortised into the side frame pieces in like manner. The front crosspiece has a two-inch slot cut where it crosses each center piece and the center pieces each have a one inch slot to receive the crosspiece. As is illustrated in this cut, wooden handles may be used if iron ones are not at hand.—J. G. Allhouse, in Ohio Farmer.

Corn and Bran for Calves. Prof. Henry, of the Wisconsin station, recommends a combination of two parts of bran and one part cornmeal for calves as a good growing ration. Bran is a fine muscle-forming feed, but corn alone is too much inclined as a fat former. Thus the advisability of the combination of the two. It is expected in connection with this that the calves are securing a good supply of milk either direct from the cow or skimmed milk. This combination is so proportioned that the calves may be given what they will clean up two or three times a day. If this feed is given properly the calves should make excellent gains all the time they are consuming milk. The calves should grow thrifty and vigorous.

Net Loss in Storing Hay. What will well-cured hay in the field lose by storing in mow until spring? One-fifth is a common estimate. The hay on three plots was sufficiently cured to remain in fine condition in the mow, and the next February the shrinkage was found to run from 15 to 20 per cent. Where the yield was over four and one-half tons an acre the curing was not so thorough as on plots of lighter yield, though sufficient for safe storage. So we may safely infer that 20 per cent. is a safe outside estimate for shrinkage in the mow. Thoroughly cured grass will lose less, say one ton out of each six.—Farm and Fireside.

Essentials of a Good Farm. But wherever he lives, north or south or in the center of the state, there are characteristics, earmarks, so to speak, by which the farm of the up to date farmer is quickly recognized. It has a tidy appearance, the fences are in order and the gates are on their hinges and swing free. There are no weeds by the roadside. His house and barns are painted. His doors and barns are hooked shut or open, they are never left swinging. His animals are never calling for water, nor his windmill for oil. Such a farm is a benediction to the neighborhood and a benediction to its occupants.—Joseph Carter, in Farmers' Review.

HOME CHEESE MAKING.

Process of Manufacture, Together with All Other Necessary Requirements, Described in Full.

Where but two or three cows are kept it is better to buy what cheese is consumed than to try to make it. Where cheese may be needed it may be well for two or three farmers to go together and let one party make cheese for all. Twenty-five gallons of milk will make a cheese of 20 pounds. This will require a hoop about 11 inches in diameter and about the same in height. The other requirements will be the cheese tub to set the milk in, a basket, a strainer cloth for draining the curd, and a press of suitable size to accommodate the cheese to be made. The milk should be heated to about 80 or 84 degrees. Soak rennet in a weak brine, using about three quarts for one rennet. One rennet will curdle about 2,000 quarts of milk, and the quantity can only be ascertained by experiment, since they are of various strength, but sufficient should be used to curd the milk in 20 minutes. Cut in squares of about an inch with a knife that will reach the bottom of the tub, the whey dipped or run off and the curd carefully broken with the hand. Heat the whey that has been dipped off, or an equal amount of water to 150 degrees and turn this over the curd so that all parts may be scalded alike. Stir slowly and carefully. Cover so as to prevent cooling, and let it stand about 20 minutes, when the whey is dipped off again and the whey allowed to drain off. In about 20 minutes it will be sufficiently cool to again be turned in the tub, where it is stirred or cut up fine enough so as to take salt freely and through all parts of the curd. Put in about one ounce of salt to each 12 quarts of milk. When salt is thoroughly mixed with the curd it is dipped into the cheese hoop, which has had a cloth previously put in it. Bring the cloth all about the curd and put to pressing. The pressure should be moderate at first, and as soon as it is sufficiently pressed to handle take it out and put in a dry cloth in the same press. This cloth should be made to fit the press as smoothly as possible, so the cheese will be of an even shape. Put it in the press, and let it remain until the press is wanted for another cheese, or about 18 to 24 hours. After taking from the press let it stand for awhile, until the outside hardens and then rub it with hot whey, butter or other soft grease, rubbing and turning thus daily until it is cured, which will require some days.—The Homestead.

CHEAP OCTAGON SILO.

Just Large Enough to Feed Twelve Head of Cattle Twice a Day for Six Months.

A perfect silo can be built for one-half to one-third the expense they cost many who build or buy them. By building it octagon, or eight-sided in shape, and ceiling perpendicular with two thicknesses of inch hemlock boards with felt paper between a perfect silo may be made at small cost. I built one in August, '99, and have filled it twice. It gave perfect satisfaction last winter. Every silo that has been built in this vicinity since, and I know of 12, have been built after the same plan, and others will be built the coming year. They can be built any size wanted. With 2,500 feet good hemlock boards,



FRAMEWORK OF OCTAGON SILO.

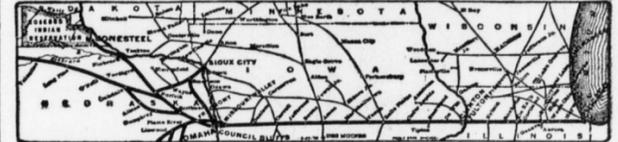
900 2x7's, three feet long and six cental boards worth of felt nails, three men could build a silo in three days. The expense for roof and bottom would be the same as for any other shape or style.

I got out the lumber for mine and paying, the saw bill, cement, nails, paper, mason work and all complete it cost me \$29.70. The size is 12 feet high and 24 feet high. It will hold silage enough to feed 12 head of cattle twice a day for six months. When the foundation is completed, place the sill on and nail the corners together. Then set the boards up at the corners and plumb them with a level or plumb staff; let one man hold the joint on the outside where they belong, place two feet apart and nail them from the inside. Spike the first 12 feet, then put the upper section up the same way. The joint may be sawed the same length with a crosscut saw by bunching them together. By the ground plan it will be seen that the joist and boards at the corners all have to be the same slant, which is a square miter or an angle of 45 degrees. I have been a carpenter all my life, until the last ten years, when I have been farming.—Alonzo Hevenpecke, in Orange Judd Farmer.

There is a work of breeding fowls to the standard in feather and show points, that must be left to the scientific breeder. This, however, does not argue against every poultry raiser not being a breeder of pure blood fowls.

Wild flowers may be transplanted to the home lot from the woodland or prairie when in bloom if enough soil is taken to move them without disturbing the roots.

THE ROSEBUD INDIAN RESERVATION TO BE OPENED FOR SETTLEMENT.



A HALF MILLION ACRES OF RICH LANDS TO BE THROWN OPEN.

FINEST GRAZING AND FARMING LANDS.

DIRECT RAILROAD NOW BUILDING.

The new extension now being built by the North-Western Line to Bonesteel, S. D., brings to mind the treaty recently made with the chiefs of the famous Rosebud Reservation is to be turned over to the government and one more of the few choice tracts of public lands now remaining, be thus opened to settlement.

The land in question lies between the Missouri and Niobrara rivers and is well watered and fertile. Farm lands near the reservation are selling at from \$20 to \$35 an acre, grazing lands at from \$6 to \$15.

The country is level or slightly rolling, consisting of black loam with clay subsoil, making the very best of farming land. It seems to suffer exceptionally little from drought.

An Unfavorable Symptom.

"You have what I call a quinine cough," said the doctor, proceeding to mix a dose of medicine for his caller.

"And a quinine cough, I suppose," wheezed the patient, "is a sort of Peruvian bark."—Youth's Companion.

Don't Get Footsore! Get Foot-Ease.

A wonderful powder that cures tired, hot, aching feet and makes new or tight shoes easy. Ask to-day for Allen's Foot-Ease. Address A. S. Olmsted, Le Roy, N. Y.

From the lowest depth there is a path to the highest height.—Carlyle.

A healthy, definite purpose is a remedy for a thousand ills.—O. S. Marden.

Perseverance is failing 19 times and succeeding the twentieth.—J. Anderson.

Work yields the weapons of power, wins the palm of success, and wears the crown of victory.—A. T. Pierson.

"When you think about marryin' a man to reform 'im, Miss Lady," remarked Uncle Eben, "remember dis; it's mo'n he'd ebber do for you."—Miss Quizz.

"What makes you think he loves you?" Miss Gotawad—"He has never asked me how much I am worth."—Ohio State Journal.

Dickens used to say that it is very easy for young authors to "come out," but it is difficult to prevent their going in again. [Which reminds us of the famous saying of a cabinet minister of England, that "he came in with little opposition, but went out without any."]

"Mr. Gripper says he believes in looking at the bright side of things." "That's correct, I guess. I don't believe he takes the slightest interest in anything without keeping his eyes open for a few shining silver dollars."—Washington Star.

"Say!" she cried suddenly, as the bashful young man backed into the nearest chair, "you must think you're a bird." "Beg pardon," he stammered, "I don't understand what—" "You're on my hat!" she shrieked.—Philadelphia Press.

A Fast Crowd.—"Of course you read about that horse breaking the record. Goodness! I don't see how a horse could be so fast." "O, I don't know. Look at the class of people it has to associate with at the race-tracks."—Philadelphia Press.

"I'm so sorry I was not at home when you called yesterday," gushed Mrs. Hipperkit, who, to tell the truth, was at home. "I was so afraid you would be," replied Mrs. Crusher, who had seen Mrs. Hipperkit through the window.—Ohio State Journal.

CASTORIA

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Genuine Carter's Little Liver Pills. Must Bear Signature of Dr. J. C. Fletcher.

See Fac-Simile Wrapper Below.

Very small and as easy to take as sugar. CARTER'S LITTLE LIVER PILLS. FOR HEADACHE. FOR DIZZINESS. FOR BILIOUSNESS. FOR TORPID LIVER. FOR CONSTIPATION. FOR SALLOW SKIN. FOR THE COMPLEXION. CURE SICK HEADACHE.

A great boom has sprung up in Bonesteel, to which point the North-Western Line is building. Last fall there were fifty settlers there. To-day there is a town of 300. Ninety days from now there will be 3,000. Five real estate offices have opened, and town lots are selling at from \$300 to \$800 each.

The Reservation will probably be opened by a lottery plan, such as was made use of in Oklahoma. Fifty thousand people are expected to take part in the drawing for the land.

To enter a homestead of 160 acres one must be the head of a family or have attained the age of twenty-one years; a citizen of the United States or one who has filed his declaration to become such. To establish a title to the land, residence must be maintained thereon, improving and cultivating the land continuously for five years.

With the completion of the North-Western Line from Verdigris to the Reservation boundary at Bonesteel, there will, without doubt, be a tremendous influx of homesteaders as soon as the President's proclamation sets a date for the opening. Interest in the matter in Nebraska is intense.

A New Train TO St. Louis.

Has been inaugurated by the

"Big Four" Exposition Flyer.

Look at the SCHEDULE.

Table with columns for destination (Lv. Cleveland, Lv. Shelby, etc.) and time (5.00 P. M., 6.35, etc.).

Making all connections for the

West and Southwest

For further information and particulars call on Agents "Big Four Route," or address the undersigned. WARREN J. LYNCH, W. P. DEPEE, Gen'l Pass. & Tkt. Agt. Ass't. G. P. & T. A. CINCINNATI, O.

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LIVE STOCK AND MISCELLANEOUS ELECTROTYPES. IN GREAT VARIETY for sale at the lowest prices by A. N. Kellogg Newspaper Co. 71 Ontario Street, Cleveland, Ohio.

OLD SORES CURED. Allen's Ulcerine Salve cures Chronic Ulcers, Bone Ulcers, Scalded Ulcers, Varicose Ulcers, Indolent Ulcers, Herpetic Ulcers, White Swelling, Milk Leg, Eczema, Salt Rheum, Fungus Sores, all old sores. Positively no failure, no matter how long standing. By mail, 25c and 50c. J. P. ALLEN, St. Paul, Minn.

FREE TO MOTHERS of suffering babies. Send to Henry C. Blair, Walnut & 8th St., Philadelphia, for a Teething Necklace. Money refunded if not satisfactory. Fifty cents, mail prepaid.

OPIUM WHISKY and other drug cases. Book and references FREE. Dr. R. M. WOOLLEY, Box 8, Atlanta, Ga.

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