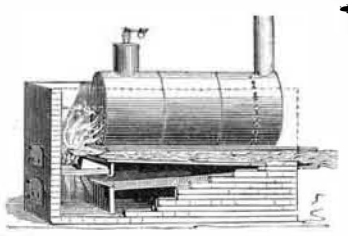
RECENT INVENTIONS.

Bagasse Furnace.

The engraving shows a furnace in which green bagasse may be burned as fuel in the manufacture of sugar and molasses in localities where fuel is scarce and expensive. The invention consists of a chute or chutes contrived, in connection with the furnace, for feeding the fuel along where it is exposed to the heat of the furnace or the flue leading therefrom to the chimney a suitable distance, and for a length of time enabling the fuel to dry and heat, so that it will burn with good results when it finally discharges into the furnace. In evaporating and other furnaces the inventor proposes to arrange the chute to enter the furnace from the back, where the fuel will have the benefit of the whole length of the run of the flame under the evaporating pans from the furnace to the chimney. This invention has been patented by Mr. John Hill, of Independence, Kan. (Box 224).

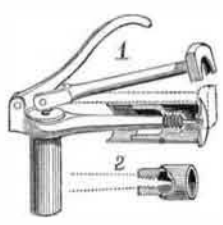


Fruit Picker.

We give an engraving of a very simple and effective fruit picker recently patented by Mr. Lebbeus Simkins, of Marshfield, Oregon. The invention consists of a tube having at its upper end two hollow hemispherical cups, one fixed to an arm projecting from the tube, the other secured to a lever pivoted to the tube and having its shorter arm pivoted to a rod extending down the tube and connected with a hand lever, by which the movable hemispheres are brought together upon the fruit to be picked. A spring attached to the upper end of the rod separates the movable hemisphere from the fixed one when the hand lever is released. With this implement fruit may be picked from the outer and top limbs of a tree, where it could not be reached from a ladder or from the tree, and lowered to the ground or into a basket without being injured.

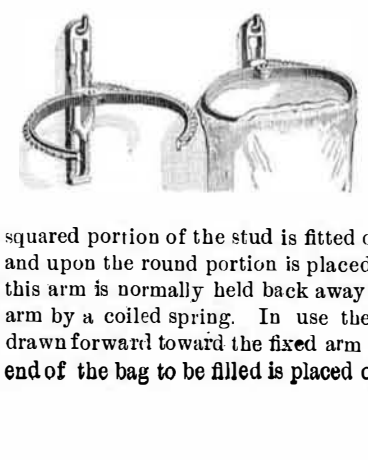
New Cartridge Implement.

The engraving shows a new instrument for capping, loading, and extracting shells, also for removing the caps from the shells. The instrument is composed mainly of three parts, an arm, a handle jointed to the rear end of the arm, and an auxiliary arm, jointed to the handle near its pivot. The main arm is apertured near the pivot of the handle for receiving the body of the cartridge shell, and the handle has an anvil above the center of the apertured portion of the main arm, so that when a shell is passed through the aperture with its flange resting upon the upper side of the arm, the primer or cap can be forced into the shell by means of the handle and its anvil as shown in Fig. 1. Upon the end of the auxiliary arm is a perforated or semicircular flange, made with a groove for receiving the flange of the shell for the purpose of extracting the shell from the gun. Upon the end of the main arm is a pin, and the arm is also screw threaded for receiving a hollow block which is used as a rammer for loading the shell, and also as a guide for decapping. This invention has been patented by Mr. Edmund R. Darling, of Woonsocket, R. I.



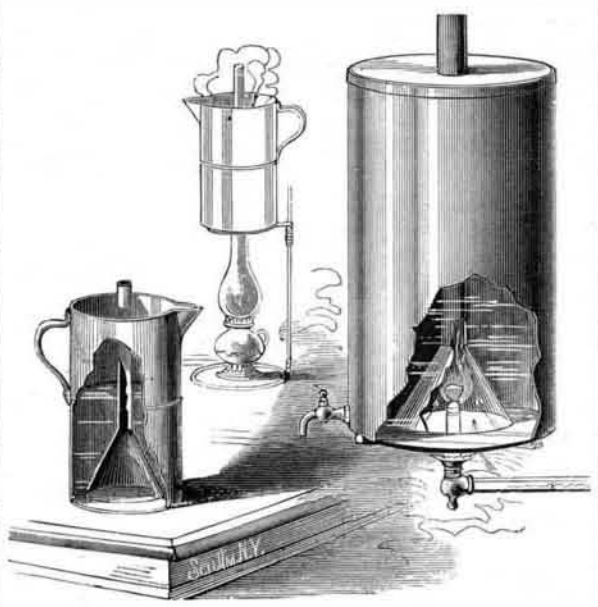
Improved Bag Holder.

The engraving shows an improved device for holding bags while being filled. A cast iron frame is secured in a vertical position to the wall or other support by means of screws, nails, or other convenient fastening. This frame is formed upon its front face and upper edge with the notches, and is formed with the inwardly projecting flanges with which the T-stud of the sliding head is adapted to engage for locking the head and frame together, and at the upper end of the frame these flanges are cut away, so that the head may be attached to and detached from the frame. The sliding head, besides being formed with the T-stud at the back, is formed also with the lip near its lower end, that is adapted to rest in the notches of the frame. Upon the upper end of the sliding head there is a stud which is squared at its lower end as shown, and round at the upper end. Upon the squared portion of the stud is fitted one of the curved arms, and upon the round portion is placed the other curved arm; this arm is normally held back away or open from the other arm by a coiled spring. In use the movable arm will be drawn forward toward the fixed arm and held while the open end of the bag to be filled is placed over or upon the arms. The movable arm will then be released, when the spring will draw it back, and thus hold the bag upon the arms and hold the upper end of the bag open. The sliding head will then be raised in the frame to suit the length of the bag. The edges of the arms are notched or serrated to insure firm hold on the bag. The device constructed in this manner is very cheap, durable, easily handled, and may be adjusted to bags of various sizes and lengths, so that it is perfectly practical for its purpose. This invention has been patented by Mr. E. E. Alderman, of Portville, N. Y.



Benson's Culinary Heater.

This invention is a combination of a cylindrical vessel and an inverted funnel. It is intended for boiling and keeping hot, water and other fluids by means of a gas or oil lamp, the flame of which is introduced into the funnel, and thus utilizing nearly all the heat. This device will be found very useful to restaurant-keepers, barkeepers, barbers, and others who wish to keep hot water constantly on hand. A small article made in this way is useful for shaving and other toilet purposes. It will be a very great convenience in the sick room and nursery.



This device may either be used as a cup or as a funnel. To dealers in liquids this combination will be valuable.

The engraving shows the heater applied to a gas burner, also to a kerosene lamp.

For further particulars, address the patentee, Dr. W. H. Benson, Staunton, Va.

Man's Invisible Foes.

The most indifferent and self-confident man, to whom sickness and disease are merely matters of speculation or curious inquiry, would feel his courage, like Bob Acre's, "ooze out at the end of his fingers" should he meet Dr. Burrill's summary of the bacteria, those minute organisms, one twenty-five thousandth of an inch in diameter, which swarm through the air, infest decomposing materials, and which might, under the most favorable conditions, multiply at the rate of three hundred billions in forty-eight hours from one individual. Dr. Burrill's discussion of the bacteria is interesting, though not especially striking in any new information it imparts, but the synopsis of genera and catalogue of species with which it concludes is quite valuable to workers in protistic life. Thirteen well defined genera and two doubtful genera are enumerated, and their characters briefly stated are as follows:

Micrococcus. Cells globular or oval elliptical, motionless, isolated or united in chains. These embrace pigment forming micrococci, 7 species; ferments, 4 species; disease germs, 11 species; doubtful species, 10.

Ascococcus. Cells globular in irregular groups, often lobed and enveloped by a capsule of firm jelly; this genus contains one species.

Cohnia. Cells globular, inclosed in a jelly-like sac more or less spherical, the walls at last breaking up in net-like openings. It includes one species found in swamps, on decomposing algæ, etc.

Sarcina. Cells globular, dividing in two or three directions, secondary cells small, joined in solid or tabular families in fours or multiples of four. The genus embraces five species.

Bacterium. Cells short cylindrical or long elliptical, rapidly moving much as micrococcus; 14 species.

Bacillus. Cells elongated, attached in rod-like rows or threads, also forming chains; 10 species.

Leptothrix. Very long, slender unbranched threads; 2 species.

Beggiatoa. Filaments very long, slightly or obscurely jointed, moving rapidly; 8 species.

Cladothrix. Like Leptothrix, very slender, colorless, branched, undulating, doubtful; 2 species.

Myconostoc. Filaments slender, colorless, not jointed, embedded in jelly; 1 species.

Spirochæta. Filaments long, very slender, closely wound in places, active; 4 species.

Spiromonas. Cells flattened, spirally twisted; 2 species.

Spirillum. Cells cylindrical, a hair at each end curved or wound; 10 species.

The Saccharomycetes, not included in the foregoing list, are the yeast fungi, and embrace 11 species.

The number of apparently authenticated species is large, but perhaps not so large as the fervid imaginations of students in biology may yet make it. It is to be hoped that the burning zeal which evolves these perplexing forms will be tempered if not quenched by the prudent use of some medical conservatism.

Gas from Iron Cement.

In the construction of a railway bridge over the Forth, a number of cylinders were sunk into the bed of the river. They were built of iron rings 6 feet in diameter and several feet high, and made a total height of 60 feet. The space round the sections was filled up from the inside by a rusting composition of iron turnings mixed with sulphur and sal ammoniac. When wet, this mixture oxidizes and swells up, so as to fill the spaces into which it is thrust. It was applied to the joints by one man. One day last May, however, when there was a perfectly still, somewhat hazy atmosphere, and considerable heat without direct sunshine, this man was observed to become overpowered by some "mysterious influence," and a companion descended by a windlass to bring him up to the top of the cylinder. He managed to get the man into the bucket of the windlass, and so to get him hauled up into purer air; but the deliverer himself succumbed to the same influence, and falling into a pool of water at the bottom of the cylinder was unfortunately drowned. One of the contractors now descended, taking care, however, to fasten a rope to his body, and it was fortunate he did so, as he also succumbed and had to be pulled out by the rope. Dr. Wallace was called in to account for this fatal accident and traced it to the absorption of oxygen by the rusting compound, thus depriving the air in the cylinder of its sustaining power. The oxygen combined with the iron and sulphur of the mixture, and the state of the atmosphere prevented free circulation of fresh air into the cylinder. The result was that the gas breathed by the man was nitrogen, or air robbed of its oxygen. The normal proportion of that gas in the air is 20·9 or 21 per cent, and Dr. Angus Smith has shown that this proportion cannot be altered, even by one-quarter per cent, without producing appreciable effects, while a loss of one-half per cent gives rise to serious inconvenience, and air containing only 20 per cent of oxygen may produce grave consequences if breathed for a considerable time. When the deficiency of oxygen exceeds this to a sensible extent, a candle refuses to burn.

Brilliant Colors for Glass and Porcelain.

BY DR. R. KAYSER.

The pigments commonly employed for decorating glass and porcelain have hitherto been prepared either by melting the metallic salt, which is generally the nitrate, in resin (colophonium), or by decomposing soluble resin soaps with the solutions of these salts, whereby an insoluble resinate is formed, which is first dried and then dissolved, just as that formed by fusion is, in oil of turpentine, or lavender, or in nitrobenzol or some similar solvent.

Both of these methods of preparation have their disadvantages, the principal one being that a considerable quantity of the metallic salt remains undissolved, and when the resinous mass is dissolved it is precipitated and lost, or, at best, is only recovered by a tedious operation.

With the help of carbolic acid these pigments can be prepared without difficulty and without any insoluble metallic compounds separating worth mentioning.

Bismuth.—Ten grains of metallic bismuth are dissolved in aqua regia and evaporated in a porcelain dish to a thin sirup. When cold 50 grammes of carbolic acid liquefied by gently warming in hot water are added. It is left standing a few hours, for if warmed and stirred at once an energetic reaction takes place with violent foaming. At the end of this time it is well stirred with a glass rod and heated awhile in a steam bath, when there will be an evolution of hydrochloric acid vapors. It is taken off the steam bath as soon as a drop taken out on a glass rod will dissolve clear in nitrobenzol. When this point is reached, the mass is dissolved in nitrobenzol or a mixture of nitrobenzol and oil of spike, when the preparation will be ready to use.

Tin.—Ten grammes of pure tin are dissolved in aqua regia and the solution evaporated to a thin sirup, then mixed with 50 grammes of carbolic acid in the manner above described. The remainder of the operation is the same as for bismuth.

Uranium.—Fifteen grammes of nitrate of uranium are mixed with 40 grammes of pure hydrochloric acid and dissolved. This solution is also mixed with 50 grammes of carbolic acid, as before, and treated as already described.

Iron.—Fifteen grammes of perchloride of iron are dissolved in pure hydrochloric acid and any excess removed by evaporation, so the solution when cold will have the consistence of a thin sirup. To this are added 50 grammes of carbolic acid; and it is then treated as described under bismuth.

A manganese pigment can be made from the chloride of manganese; and nickel and cobalt pigments from their chlorides in precisely the same manner as that of iron was made from its chloride.

Of course the finished preparation can be diluted to any desired extent, as the concentration of the original preparation leaves plenty of play for dilution.

The different pigments above described may be mixed with each other to form all kinds of combinations.—*Deut. Ind. Zeitung.*