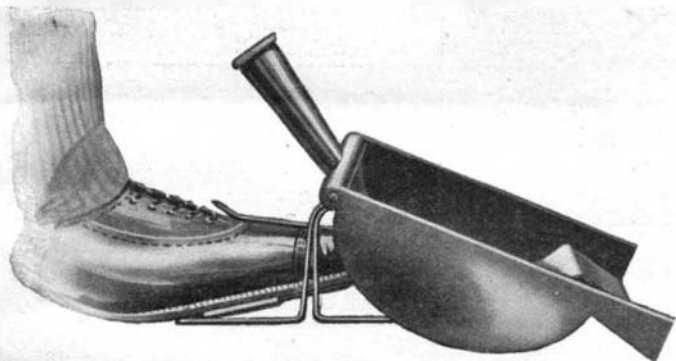


**DUSTPAN WITH FOOT ATTACHMENT.**

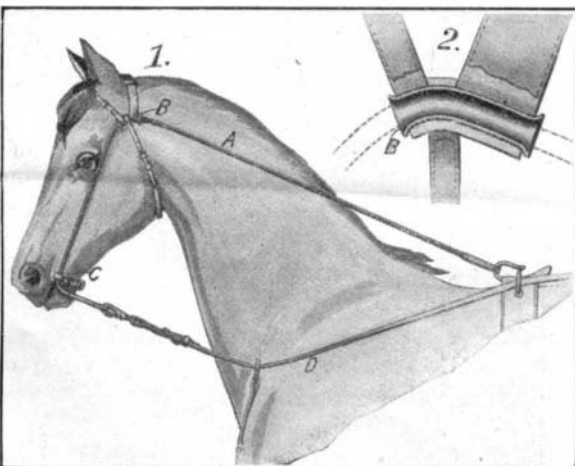
In the search for opportunities to exercise their ingenuity, inventors are only too apt to overlook the little details close at home, and hence it happens that the household, the oldest of institutions, is still sadly in need of many improvements. The accompanying engraving shows that there are possibilities for invention even in a dustpan. It seems odd that no one

**DUSTPAN WITH FOOT ATTACHMENT.**

before has thought of the incongruity of using a short-handled dustpan with a long-handled broom. Mr. C. W. Robinson, of 923 Fourth Street, San Diego, Cal., has devised the pan which we here show with a view to obviating the necessity of stooping over when sweeping dust into the pan. The improved pan is formed with means for attaching it to the foot of the operator, so that it can be conveniently held at the proper working angle while both hands are used in wielding the broom. The foot attachment is formed of wire, bent to such a form as to provide a support for the pan and also a stirrup for the foot. The stirrup is in the form of a spring clip, so that it will cling to the foot of the operator as it is moved from place to place. When disengaged from the foot the pan will stand at the proper working angle, being supported by the wire frame. The invention also provides an improvement in the pan itself. Instead of having a flat bottom, the pan is formed with a pocket in which the dirt may be received. This will prevent the dirt from sliding out of the pan when it is moved about.

AN IMPROVED BRIDLE.

The accompanying engraving illustrates an improved form of bridle which is of very simple construction and provides an effective means for bringing a horse to a quick stop. The bridle is humane in its action and is so arranged as to multiply the power at the bit as compared with that applied to the reins. It thus enables the driver to control the horse with small exertion. The check rein which is shown at A passes through an elbow, B, which is supported by the head and brow straps. Thence the check rein passes down through eyes formed on the ends of the bit and is buckled to the reins, D. The bit is concavo-convex in cross section with rounded edges so as not to injure the tongue or the mouth of the horse. It is preferably made of aluminium with a steel core and is arched over at its center to fit the lower jaw of the horse below the grinders and above the nippers in such a way as not to interfere with, or press on the animal's lips. In operation, when the reins are pulled, the bit is pressed on the horse's tongue, allowing the check rein to slide freely through the elbows, B, and eyes of the bit, C, thus drawing the horse's head upward with multiple force. It will be evident that by this arrangement with a slight pull on the reins the horse's head is forced to stand erect through the action of

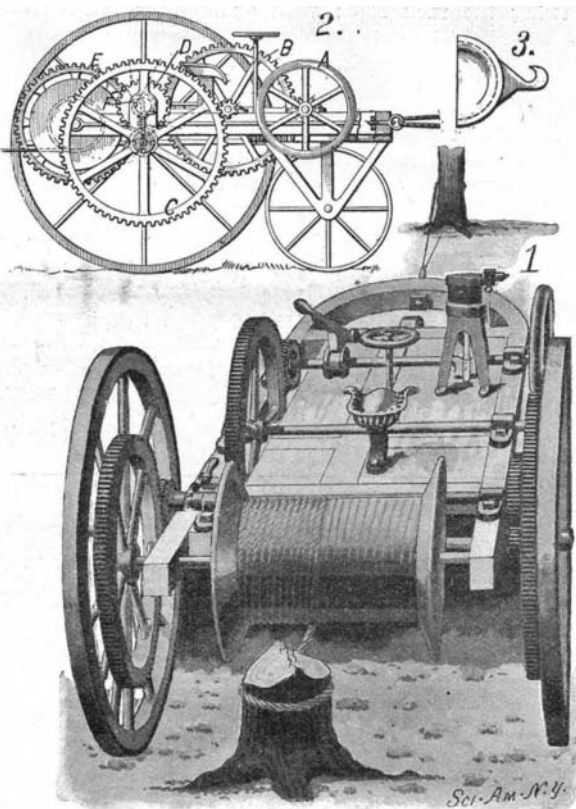
**AN IMPROVED BRIDLE.**

the check rein, and the check rein at the same time performs its ordinary function. The inventor of this improved bridle is Mr. Robert H. Williams, of Maize, Kan. (P. O. Box 28).

MOTOR-DRIVEN STUMP PULLER.

A recent invention covers an improved form of stump-puller provided with a motor, which may be used both for moving the machine from place to place, and also to furnish power for pulling stumps. As shown in the accompanying engraving, the machine consists of a platform supported on two traction wheels and a front steering wheel. The motor which drives the mechanism is mounted at the front of the platform, and drives a transverse power shaft on which the flywheel A is secured. The power shaft carries a pinion which meshes with a gear B. The latter is mounted on a shaft which carries a pinion meshing with a gear C. The gear C is mounted to turn freely on the rear axle of the machine. Securely fastened to this gear at the center is a pinion which meshes with a gear D, and the latter transmits the power of the motor through a pinion to a gear E. The gear E is keyed to a shaft which carries the winding drum of the machine. In operation, when it is desired to pull a stump, the machine is anchored by means of a cable, which is passed through an eyebolt in the front of the platform. The cable, which passes around the winding drum, is then attached to the stump to be pulled. One of the detailed views shows a

form of fastening block which will be found useful for attaching the cable to the stump. It will be evident that when the motor is started, the winding drum will be turned with considerable power, owing to the step-down transmission gearing. In the side view of the stump puller it will be observed that the wheel in the foreground is broken away, leaving only a section

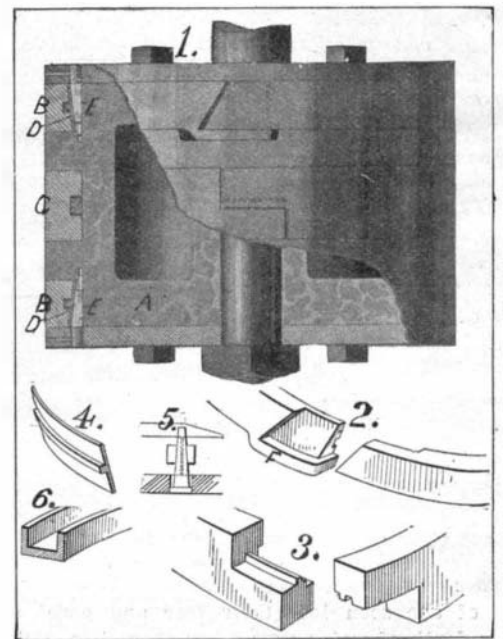
**MOTOR-DRIVEN STUMP PULLER.**

of the hub. It will be noted that the hub is formed with radial sockets, and that on the gear C a pin F is mounted to slide vertically. When it is desired to move the machine from one place to another, this pin F will be moved into engagement with one of the sockets, to couple the gear C with the hub of the wheel, so that the motor will operate to drive the traction wheels. The inventor of this improved stump puller is Mr. J. L. Jones, Rift, Ga.

METALLIC PISTON PACKING.

Illustrated herewith is an improved metallic piston packing for steam engines which is designed to impose very little resistance to the free movement of the piston, and at the same time remain tight in spite of considerable wear. The main body of the piston consists of a casting A formed with a pair of annular ribs and between these and the ribs a pair of recesses are formed in which the packing rings B are seated, and in the central recess between the ribs a bull ring C is seated. This bull ring is made in three sections connected together by step joints, the step projections being mortised together as shown in Figure 3 to assist in keeping the sections in proper relation to each other. The bull ring is formed with a groove on the inner side to receive a ring of spring metal which presses the sections into engagement with the cylinder. The main packing rings B are each formed

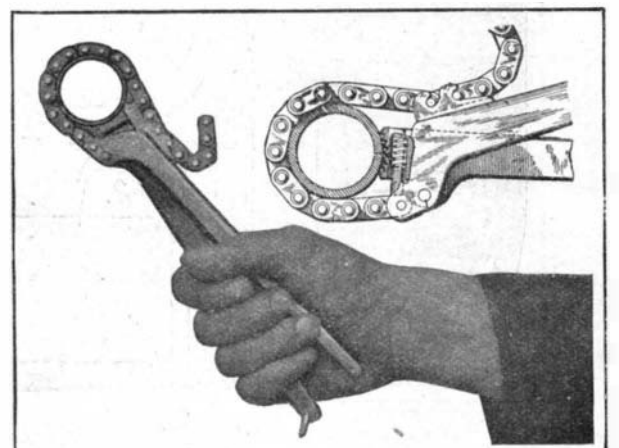
in a single piece joined as shown in Figure 2. It will be observed that one end is provided with an extension F which passes under the other end and that the rib on the casting is cut away to receive this extension. Within each packing ring a spring ring D is fitted, this ring being formed with a tongue, as shown

**METALLIC PISTON PACKING.**

in Figure 4, which is adapted to engage a groove in the packing ring. To adjust the tension of these rings a series of wedges E are fitted between them and the body of the piston. Each wedge is formed with a shank which enters an opening in the adjacent disk, and a pin seated in this disk engages a slot formed in the shank, the purpose of the pin being to limit the extent to which the wedge may be driven in behind the ring D. In Figure 6 an alternative form of ring is shown which may be used in place of ring D. Figure 5 shows an alternative method of spreading the ring D. In this construction the ends of the ring are formed with lugs between which the wedge E is driven to spread the ends apart. In the operation of the piston the bull ring serves as a packing and also as a guide for the piston in its movement, so that the wear is evenly distributed. The patent on this improved packing is controlled by P. H. Geoghegan, 35 Frankfort Street, New York.

IMPROVED PIPE WRENCH.

A recent invention, which we illustrate herewith, provides an improved pipe wrench of the chain type, in which a pipe of any diameter may be gripped, without any special adjustment of the chain, other than to hook it at the desired point. The wrench comprises two members, one of which is channel shaped in cross section, while the other is a bar of steel of such thickness as to fit into the channel. The two members are hinged together, and to the channel member near the hinge pin the chain is attached. The pivot pins, that connect the links of the chain, project beyond the links at each side. The channel member carries a pair of hooks, which are adapted to engage these projecting pins. The inner end of the bar member is formed with teeth adapted to engage the pipe. In use the two members are swung apart, so as to withdraw the toothed portion into the channel member. The chain is then passed around the pipe and hooked to one of the two hooks, after which the members are drawn together, forcing the toothed portion tightly against the pipe. A jacket is provided, which may be secured to the bar over the toothed end, thus adapting the tool for use on nickel-plated or polished pipes, which might be marred by the serrated surface. A spring-pressed plunger in the bar bears against the pivot of the first link of the chain, so that when the wrench is released the members will be spread apart. A ring on the bar may be slipped over the end of the

**IMPROVED PIPE WRENCH.**

channel member, to lock the two members together. Mr. M. Z. Viau, of 24 Durand Street, Plattsburg, N. Y., has obtained a patent on this improved pipe wrench.

A NOVEL SWIMMING APPARATUS.

In the accompanying illustration we show what might be termed a "water cycle" invented by Dr. L. K. Baker, of Cleveland, O. The device is a foot-power machine for use in swimming, and so arranged as to secure greater speed from the kick or leg force employed. The power which is applied as in a bicycle operates to drive a propeller. The mechanism is attached to a bronze frame. Metal floats secured to the frame float the mechanism and the forward part of the frame is made hollow to support the chest of the operator. Materials which do not rust—bronze, copper, rubber, and aluminium—are used in the construction, and the completed machine weighs from twenty-three to twenty-six pounds. The average machine gives the user a yard of forward movement for each kick, when the arms are not used, and enables the average swimmer to double his speed. Children ten years of age soon lose their fear and pedal about in any depth of water even when there is a considerable sea. They consider it great sport to toss on the waves without danger of going down. Whenever desired the operator can lie on the machine without effort and rest, and at any moment can readily detach himself from the contrivance.

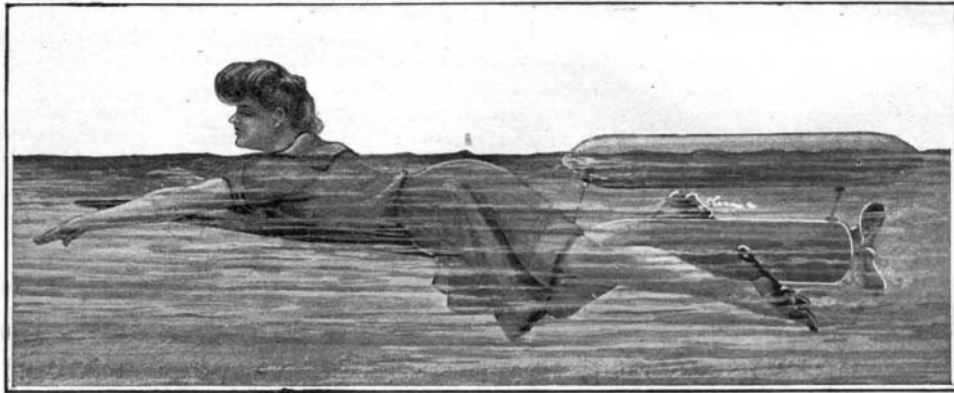
ATTACHMENT FOR STOVES.

The accompanying engraving illustrates a novel attachment for stoves of the "air-tight" type, whereby hot air with more or less of a strong draft may be delivered simultaneously beneath and above the grate, or above the grate only when a slow fire is needed. The attachment also comprises an air pump, which may be operated to provide a strong forced draft when it is desired to quickly start up a slow or dying fire. The pump is situated inside of the stove, as best shown in Fig. 2, and the handle of the pump projects through the cover of the stove, so that it may be readily operated at any time. The pump piston is formed of asbestos, so that it will not be affected by the intense heat within the stove. The pump cylinder opens into a chest *B*, which is included in the circular trunk *C*. The trunk *C* is also formed with a draft box *E*, which opens through the side of the stove. This draft box is provided with the usual damper to control the amount of draft fed to the fire. Communicating with the chest *B* is a standpipe *D*, which passes upward through the grate and is bent over to a central position over the grate. The chest *B* opens into the stove under the grate, and this opening may be closed by means of the damper *F*, which is operated by the rod *G*, as shown in Fig. 3. In operation then, when the damper of the draft box is open, the air will pass through the circular trunk *C* and through the chest *B* to the lower side of the grate. Also some of the air will be drawn up through the standpipe *D* to consume the gases above the fire. If it be desired to keep the fire low the damper *F* is closed, when air will be supplied to the fire only from above through the standpipe *D*. When it is desired to produce a forced draft the pump *A* is operated, and forces air through the chest *B* and the standpipe *D* to the fire above and below the grate. The inventor of this

novel attachment is Mr. E. P. Watson, of Bentonville, Ark.

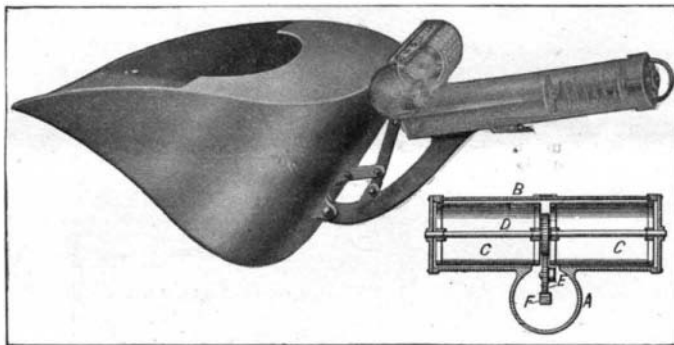
WEIGHING SCOOP.

Pictured in the accompanying engraving is a scoop provided with a weighing mechanism which will indicate the weight and the price per pound of the contents of the scoop. The scoop proper is hinged at its lower end to an arm formed on the handle *A*. This



A NOVEL SWIMMING APPARATUS.

handle, adjacent to the scoop, is provided with a transverse cylinder *B*. Within the cylinder is a drum *C*, formed in two sections. The drum sections are mounted on a shaft *D* which at its center carries a gear adapted to engage a pinion *E*. The latter passes between the drum sections and meshes with a rack *F* which at its inner end is attached to a spring secured in the handle. The opposite end of the rack passes through the handle and is attached to a lever which is connected by a link with the scoop. It will be evident that if any article is placed in the scoop the latter will tend to swing downward on its fulcrum, drawing the rack *F* outward against the tension of the spring. The extent to which this rack is moved will indicate the weight of the contents of the scoop.



WEIGHING SCOOP.

The cylinder *B* is formed with a glass covered slot longitudinally disposed therein through which it will be possible to read various figures tabulated on the drum sections *C*. The entire surface of the drum sections is covered with figures arranged in circumferentially disposed rows. When the drum is standing at the zero position each of these rows will show a certain price per pound through the glass. Numbers representing multiples of this price, that is, the cost of two pounds, three pounds, etc., are arranged circumferentially of the drum so that if the price per pound were 15 cents, and there were two pounds in the pan, the rack *F* would be extended sufficiently to rotate the drum until the number 30 would appear under the glass. If it be desired to use the scoop without the weighing attachment the rack bar is moved back to its normal position, or until a disk on its inner end engages a spring latch. A thumb lever pivoted on the under side of the handle serves to release this latch whenever it may be desired. Means are also provided for adjusting the spring to the proper tension. The inventor of this weighing scoop is Mr. Frank C. Howe, of Globe, Arizona.

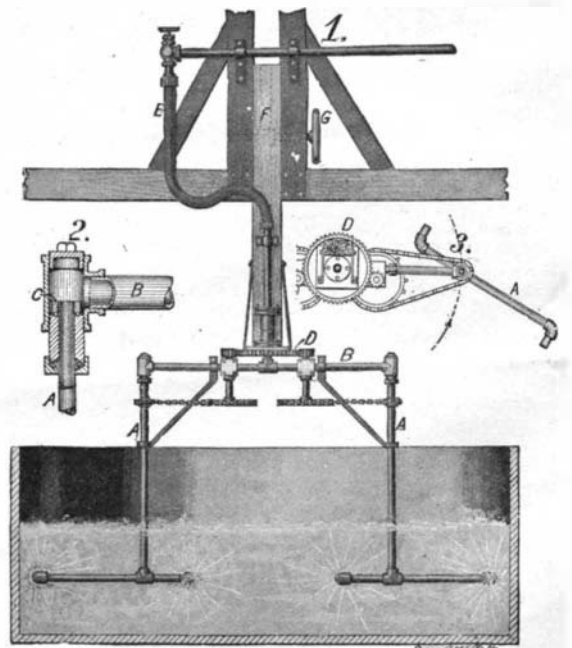
APPARATUS FOR AGITATING LIQUIDS.

The accompanying engraving illustrates a mechanism for stirring, agitating and oxygenating liquids, which, though it may be used with processes of various kinds, is particularly useful in the cyanid process of metal extraction. The machine is operated by compressed air to stir and agitate minerals which have been reduced to a fine powder and placed in a tank containing sodium or potassium cyanid solution, so as to dissolve their values, renovate the contact surfaces, and oxygenate the solution in order to increase its solving power. Figure 1 shows the apparatus in operation. Depending into the tank containing the cyanid

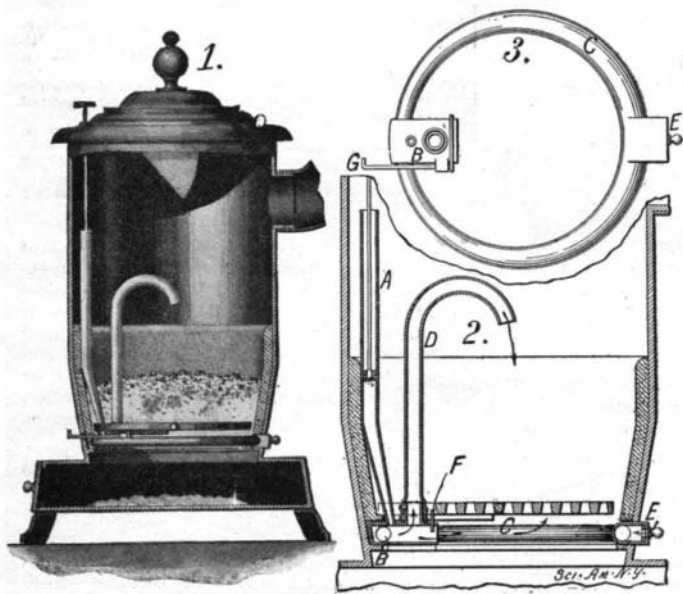
solution are a pair of pipes *A* formed at their lower ends with tubular heads, each head ending in a pair of nozzles as shown in the plan view of Figure 3. The pipes *A* communicate with a transverse pipe *B* at their upper ends, the form of coupling being shown in Figure 2. The pipe *A*, it will be observed, projects through a stuffing box and is formed with a collar *C* at its upper end which has ball bearing with the top of the stuffing box. Thus, the pipes *A* are permitted to rotate. Each pipe *A* is connected by chain and sprocket gearing with a pinion journaled on the pipe *B* and which meshes with a fixed gear *D*. The pipe *B* communicates with a flexible pipe *E* which is connected to the compressed air supply pipe. In operation the air which is forced through the system of piping and out of the nozzles strikes the liquid in the tank, and by reaction causes the pipes *A* to rotate. This motion is communicated to the pinions which, by reason of their engagement with the fixed gear *D*, cause the pipe *B* to rotate and revolve the pipes *A*. The pipe *B* and the fixed gear *D* are secured to a beam *F* which is arranged to slide in the main frame of the apparatus. A pinion operated by the hand-wheel *G* engages a rack on this beam and provides for vertical adjustment of the apparatus so as to move the pipes *A* to any desired depth in the tank. We are informed that several of these machines are now in operation in Mexico and have shown very good results. The inventor of this improved agitator is Mr. Benito Solis, of Guadalupe de los Reyes, Sinaloa, Mexico.

A recent French patent granted to the Compagnie Française des Produits Fixateur has for its object a stopper of stamped metal, of wood or other material, having a conical form and containing at the lower part a groove which contains a circular rubber band or similar elastic piece. This stopper is used in the following manner. After placing the rubber band in position, the stopper is inserted in the neck of the bottle, the latter having been filled with the liquid to be preserved. The neck of the bottle must be conical, so that the stopper fits into it snugly and its top does not rise above the neck of the bottle. The bottle thus provided with its stopper is placed in the corking machine, which is provided with a special device allowing a vacuum to be made as completely as possible above the stopper. The air contained in the bottle is drawn off, and the stopper rises to let it pass. When the operator judges the vacuum to be sufficient, he operates the machine to press the stopper into place again and also allows the air to enter above it. The bottle is thus hermetically sealed, the rubber band preventing the outer air from entering. Bottles thus stoppered can be opened with a pointed instrument or even with an ordinary corkscrew.

A substance known as phycophaein has generally been considered as the material to which the color of the brown seaweeds is due. Tswett, however, has recently stated (in Ber. Deutsch. Bot. Gesellsch.) that this substance does not exist in the living seaweed, and is not present in the chromatophore, but is a post-mortem product. A mixture of the following substances, present in the chromatophore of the living plant, gives the brown color to the alga: carotin, chlorophyllin, fucoxanthin, and fucoxanthophyll.



APPARATUS FOR AGITATING LIQUIDS.



ATTACHMENT FOR STOVES.