IMPROVED CROSSHEAD FOR LOCOMOTIVES.

Mr. W. A. Alexander, the inventor of the new locomotive link which we recently illustrated, has also devised an improved crosshead for locomotives, which is represented in perspective, Fig. 1, and section, Fig. 2, in the accompanying engravings. The general object is to render the crosshead easily adjustable at the wristpin and jaws, so that a close fit and steady motion in the guides are obtained, and so that the device will possess greater durability. The crosshead is cast in the usual manner, and has side recesses back of the piston rod socket, for the insertion of the detachable wristpin, A. The latter is turned true in the lathe and is fitted into the recesses by side guide plates, which are secured by pins to the jaws of the crosshead. These jaws are not planed square, but are made at a slight angle tc the horizontal axis of the head, as shown in Fig. 2. In relatively opposite directions on the sides of the jaws, tapered wedges, B, are placed, forming a square base support for the top and bottom steel plates, C, which are secured firmly to the crossheads by countersunk steel bolts. The wedges have apertures for the passage of these bolts, which are loosened or tightened by a key introduced into interior recesses of the jaws.

It is claimed for the invention that one pair will outlast any engine, and effect a saving of fifty per cent in repairs of connecting parts, that when the guides are once set true with the cylinders they will never need relining, and that they can be secured to the frame without the intervention of liners. The mode of obtaining a perfect alignment of the crosshead and guides with the cylinder will be seen from

Fig. 1

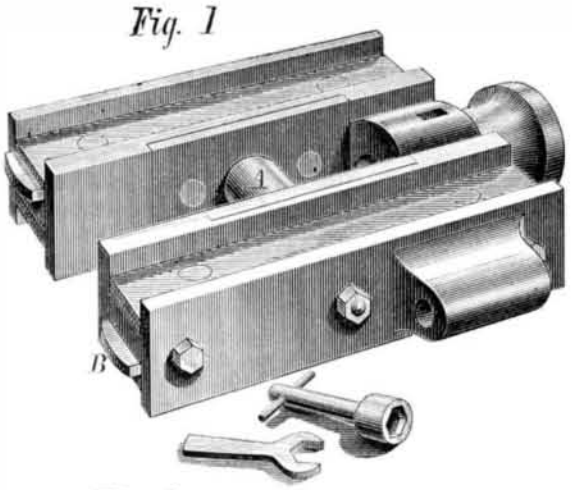
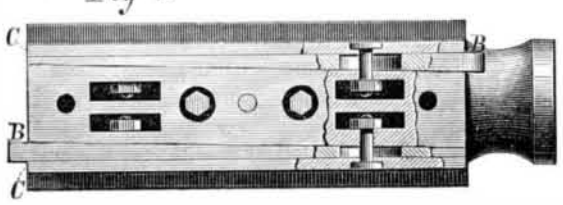


Fig 2



the following. The center line on the jaw of the crosshead, is cut in when on the planer, the guides being fitted and set true with the cylinder without liners, and secured with bolts or rivets and steady-pinned, and may be taken down and planed off the entire length whenever necessary, and replaced without the necessity of relining. The crosshead being in place, with the adjustable keys loose, is set true with the guides, with the rule, caliper, or compass by the center line on the jaws of crosshead. Thus it will be seen that no matter whether it be the guides or the jaws of the crosshead that are worn, it is only necessary to take up the wear with the adjustable keys, setting the head by the line, to insure both guide and crosshead being in perfect line with the cylinder. The piston rod and pump rod, it is further claimed, cannot get out of line, thus securing immunity from the breaking of pump lugs and the cutting away of the crosshead eye by the piston rod. The adjustable wrist pin gives at all times a round pin, effecting a great saving in the cost of brasses, oil, etc., and obviating a great amount of friction. Whenever it becomes necessary to take the piston rod out, by removing the wrist, direct access may be had to the end of the rod in order to back it out. These wrists can be made of cast steel at a very slight advance on the cost of cast iron.

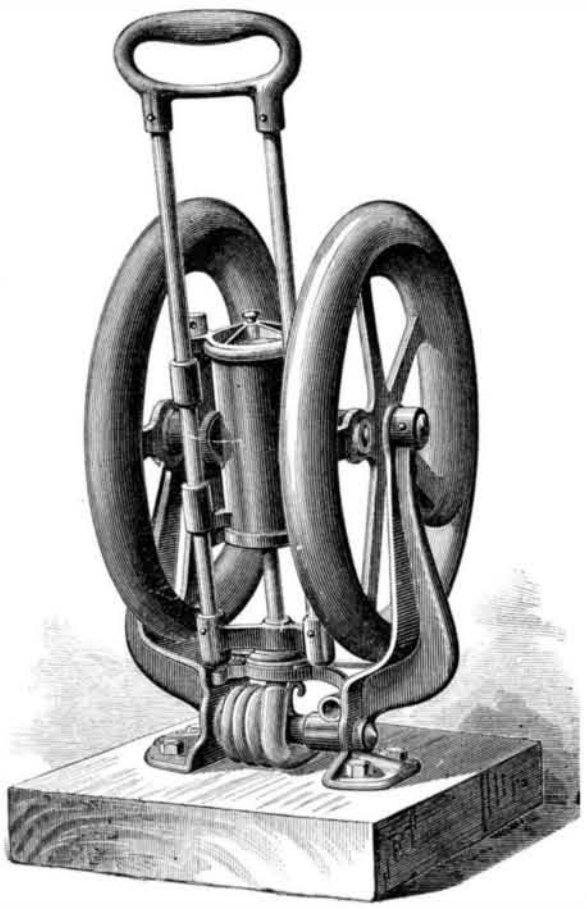
Patented through the Scientific American Patent Agency, October 6, 1874. For further particulars address the inventor, W. A. Alexander, P. O. box 130, Mobile, Ala.

Repairing Leaky Cellar Walls.

The season now at hand is the one most important for making cellars dry and cleanly. In fact, the repairing of leaky cellar walls should never be delayed, since the crevices are continually widened by the water soaking through. Cement, tar, and water glass are the best materials for the purpose, but the last two can only be used at a time when the cellar is dry, as in winter, perhaps even in September, or after drying and airing it in winter by artificial means. When nearly dry, the leaky portions of the wall can be readily recognized, and should be marked with charcoal. Holes and cracks should first be filled with hydraulic cement. The marked places, when dry, should be coated three to four times with a solution of 1 volume of commercial water glass in 2 of water, and finally, after becoming perfectly dry, with a solution of 1 volume of water glass in ½ volume of water. Instead of the solution of water glass, tar, kept quite liquid by heating, may be laid on a number of times If cement is to be employed, the marked portions of the wall should be cut out wedge-shaped, and carefully filled with a cement, rather thickly made up, with ¼ sand. If the cellar cannot be dried, the moist places should be cut out somewhat deeper (4 to 6 inches), and filled with cement, by placing a tube of material, about as thick as a finger, in the middle, and packing the cement in tightly around it, and, if necessary, holding it in place with a board until it hardens, while the water escapes through the tube without exerting any pressure upon it. After 20 to 30 days. the opening may be plugged up.

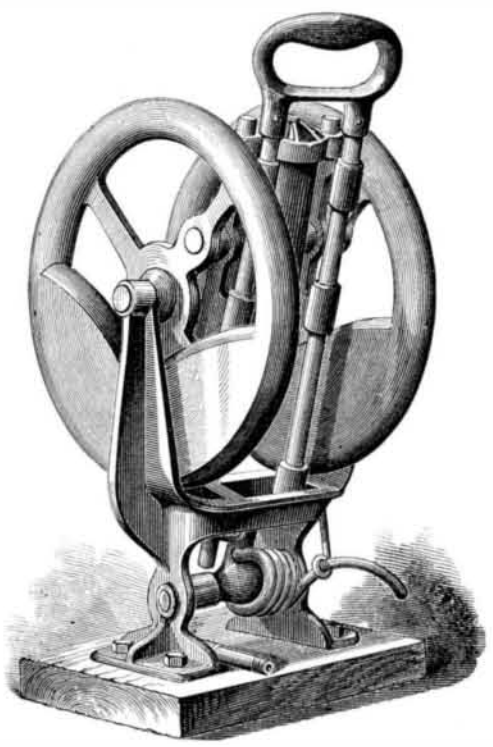
IMPROVED AIR PUMP.

The invention herewith illustrated is a new and simple air-compressing device, made of small size and excellently



adapted for use wherever liquids are to be raised by air pressure, and similar light work is to be done.

The general arrangement, as seen from the illustrations, is that of an oscillating engine, with the difference that in this pump the cylinder moves up and down, and the air is discharged or exhausted through the hollow piston rod, according as the pump used for purposes of plenum or vacuum. This arrangement does away with the complicated pipe connections, etc., necessary on double-acting pumps. The lower end of the hollow piston rod is, by means of a piece of flexible tubing, connected with the receiver or vessel operated upon by the pump.



The operation is as follows: By moving the hand lever, consisting of the frame containing the guides, piston rod, and piston, the two flywheels are rotated, and the momentum acquired by these is sufficient to bring the cylinder to a point where the resistance of the compressed air is equal to that in the receiver. At this point the guides (on hand lever) and the crank (formed on the flywheels) stand at such an angle as to work like a toggle joint and press the cylinder to the end of its stroke with great force. The same repeats itself in the other half of the rotation. All the bearings are amply large, of cast steel, and exactly in line, as the pumps are made by special tools. The clearance at top and bottom of the cylinder is reduced to a minimum, thereby, it is claimed, insuring a perfect expulsion of air; the valves are of expressly cured leather, which does not become hard, and backed by brass plates; said valves are as large as the diameter of the cylinder and piston will allow. The piston and stuffing box packing are likewise of the best material.

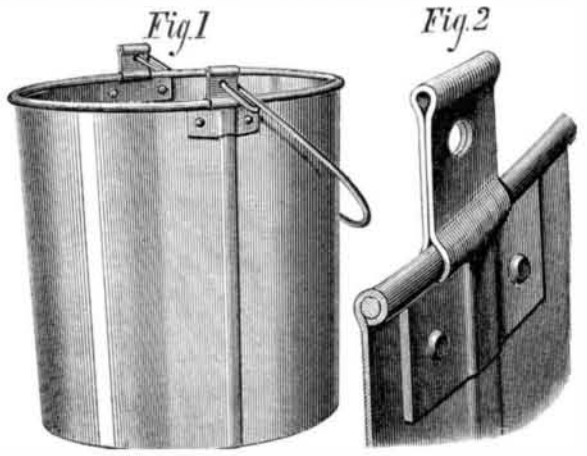
Several of these Centennial pumps are on exhibition at the Fair of the American Institute, New York city. We learn that one that has been in hard use for seven months in Philadelphia, in a large beer saloon, without being taken apart, is at present in the best possible condition. The manufacturer also builds vacuum gas-condensing pumps for higher pressure, or simple gas transferrers, on the same styles as those shown in the engravings, whose cylinders are from two by four inches up to six by seven inches.

Patent now pending. For further information apply to H. Weindel, 460 Dillwyn street, Philadelphia, Pa.

IMPROVED BUCKET EAR.

We illustrate herewith a new ear for buckets, kettles, coal hods, etc., which is constructed so as to be very strong and not liable to be torn out. Its application to a bucket is shown in Fig. 1. From Fig. 2 it will be seen that the ear is formed of a piece of any suitable metal, stamped or cut out, and bent in the middle so as to form a loop and clasping pieces, which extend, one on the inside, the other on the outside, of the bucket. The plate is so pressed that a groove will be formed to fit around the wire at the top of the vessel, and also so that it may be attached over a seam, as

Fig.1 Fig.2



shown. The rivets then pass through the side of the vessel and through both parts of the ear.

Patented June 27, 1876. For further particulars address the inventor, Mr. Joseph F. Donkin, St. Clair, Schuylkill county, Pa.

Metals Absorbed by Plants.

Professor P. B. Wilson has shown that plants take up free silica from the soil, in the form of diatom shells, which are deposited in the stalks of the plants. In a Dutch technical journal, Dr. De Loos states that vegetables are capable of taking up metallic particles from the soil. Consulted by a family suffering from lead poisoning, he found that they resided in the neighborhood of a place where the manufacture of white lead had been carried on some years previously, and they partook of vegetables grown on the spot. Dr. De Loos thereupon examined specimens of red beet, endive, and carrots, and found lead in all. In a beet weighing 1·43 lbs., he found the equivalent of 0·15 grain of metallic lead; in six carrots, weighing together 0·6 lbs., he found 2·7 grains of lead. The metal was also present in endive; and the ashes of the plants contained traces of copper, which, he thinks, existed as an impurity in the lead.

A New Electric Fire Alarm.

A new electric fire alarm, devised by M. Gaulne, of Paris, was recently described at a session of the Belgian Society of Civil Engineers. A metal box, fixed to the wall or ceiling of the room, has two metal columns which receive the conducting wires from below, and to which are attached two sensitive plates, the upper ends of which meet near the summit of the box at an acute angle when brought together. Each plate is made partly of steel and partly of an expansible metal, the steel being on the inside and extending to the end of the plate, the expansible metal being the shorter. The effect of heat on these plates is to cause the outer metal to expand; and the steel ends being brought in contact, connection is established between the wires, and a bell is sounded.

Besides serving as a fire alarm, the invention is intended to act as an ordinary call bell, and to this end a vertical rod, spring-supported, has at its upper extremity an index which, when the rod is drawn down by a cord similar to a bell pull on its lower end, rubs against the sensitive plates and thus establishes the current.

The degree of expansion of the outer metal of the plates being known, it is only necessary to approximate the ends more or less closely to cause contact to occur at any thermometric point and the bell to sound. A needle attached to one plate moves over a dial marked with degrees and fractions. This plate is moved toward or allow to spring from the other by means of a regulating screw, and thus the needle may be adjusted at any degree.