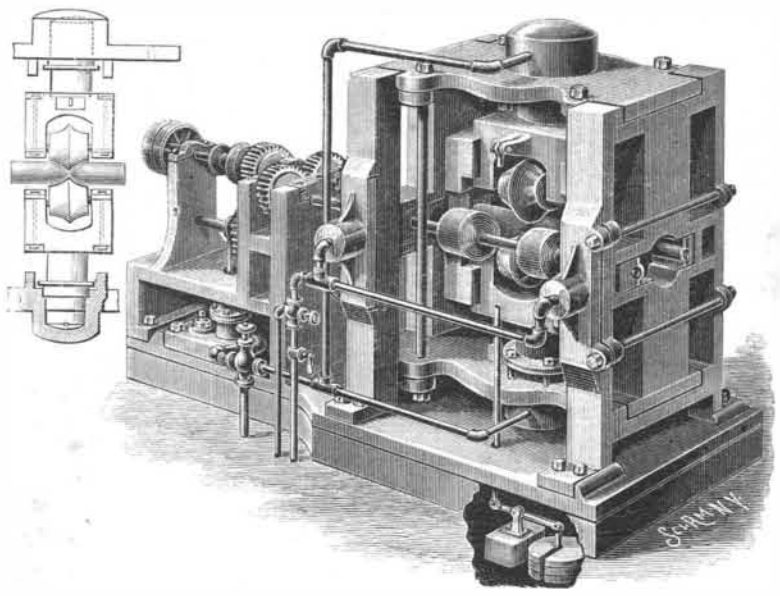
A MACHINE FOR FORMING PROJECTILES.

This is a strong and simple machine designed to form projectiles two at a time, the machine being perfectly under the control of the operator, and rolling the projectiles so accurately that they are well adapted for the best marksmanship. The improvement has been patented by Mr. John S. Griffin, Roslyn, Washington. The small figure shows parts in section, with the forming rolls and the hydraulic cylinders which move the rolls vertically. The end standards of the machine have on their inner sides guide ribs which support guide blocks for the ingot and also serve as guides for the piston heads, which move alternately toward and away from each other as the ingot is rolled. The forming rolls align vertically and have convex faces, the face of each roll having a sharp edge extending annularly around it in the center. The piston heads are secured to pistons operated like the usual hydraulic pistons, the cylinders being supplied with water from a common form of force pump. The upper piston head has on

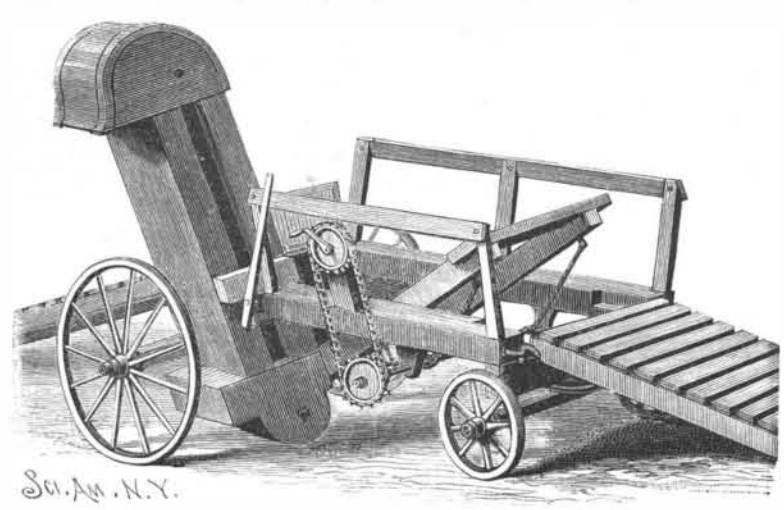


GRIFFIN'S MACHINE FOR FORMING PROJECTILES.

opposite sides lugs in which are pivoted depending rods which extend downward to the base of the machine and are pivoted to levers, each fulcrumed on a shaft, and connected with counterbalanced weights to return the piston and piston head when the water has been withdrawn from the upper cylinder. The cylindrical ingot is prepared for the machine by slightly reducing it in the center, preventing too much metal from being crowded toward the shoulders of the projectiles. The metal is treated hot, the forming rolls being forced against the ingot from above and below, the ingot being at the same time revolved and firmly held in place by rollers arranged in pairs on opposite sides of the central portion of the machine. These rollers approach the ingot horizontally, the boxes of one of the shafts being coupled directly to pistons which move in horizontal hydraulic cylinders. An independent water supply is provided for the sets of cylinders, so that the forming rolls and the driving rollers may be independently moved when desired. It is designed by this improved machine to effect a great reduction in the cost of twelve-inch and other projectiles and all varieties of mortar shells.

A PORTABLE GRAIN DUMP.

A machine designed to facilitate the handling of corn and all kinds of grain, effecting a great saving in labor, is shown in the accompanying illustration, and has been patented by Mr. Charles L. Young, of Imogene, Iowa. The machine may be driven direct to the car side, and used to load the car ready for shipment. The bed of the machine is mounted on a forward axle and two rear axles of angular construction, and near the rear end of the bed is a pit, within which a hopper is secured. The lower end of the hopper is open and



YOUNG'S PORTABLE GRAIN DUMP.

adapted to receive grain or other material dumped and deliver it to the ground or to an elevator or conveyor. The elevating mechanism may be driven by a beveled gear by turning a crank at one side of the machine. In front of the cover of the hopper are longitudinal openings in the bed, and in each of these openings is a balance or dumping beam, the beams being connected by a cross bar and the operation of a lever locking the beams in fixed position. Beneath the central portion of the bed is a shaft carrying a sprocket wheel connected by a chain with a second sprocket wheel journaled in a standard, and by rotating the upper sprocket wheel by means of its crank the lower shaft is rotated to tip the balance or dumping beams from a horizontal to an inclined position or *vice versa*. Platforms are removably connected with the ends of the bed, so that a team may be driven up one platform to the bed and from the bed down the other platform to the ground. A loaded wagon is thus driven up one platform and over the bed until its wheels rest upon the dumping or balance beams, when the locking bar is disengaged and the crank rotated to carry the beams to an inclined position; the load will then be dumped into the hopper or any receptacle placed to receive it, or will be conveyed from the hopper to the elevator.

Soldering Aluminum.

By means of the alloys mentioned below, aluminum or other metals, such as iron, tin plate, zinc, copper, brass, nickel, it is said, can be rapidly and easily soldered, either with the brazing iron or blowpipe. Aluminum can also be soldered to any of the above metals; the material is cheaper than any hitherto employed, gives a solid joint, and does not injure the metal by oxidation or otherwise: (1) Unalloyed pure tin, melting point 250°; (2) tin 1,000, lead 50, melting point 280° to 300°; (3) tin 1,000, zinc 50, melting point 280° to 320°; (4) tin 1,000, copper 10 to 15, melting point 350° to 450°; (5) tin 1,000, nickel 10 to 15, melting point 350° to 450°; (6) tin 900, copper 100, bismuth 2 to 3, melting point 350° to 450°. The first three do not color aluminum, and can be used for ornamental and artistic objects. Four and five are yellowish in color, but have the advantage of higher melting point and greater strength and hardness, and suggest the possibility of using aluminum for various articles and purposes for which hammered, coated or enameled iron, tin plate, copper, zinc, lead, etc., are now used. The *Journal* of the Society of Chemical Industry says the last alloy can be made to assume any tint of yellow by varying the proportion of copper, and is, therefore, suitable for soldering aluminum bronzes; the proportion of bismuth is adjusted so as to keep the melting point suitable for the use of the brazing iron.

For Tired Feet.

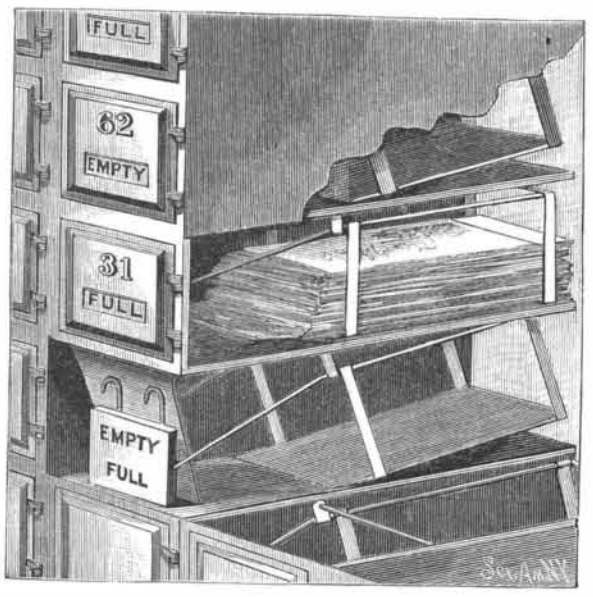
Walking heats the feet, standing causes them to swell, and both are tiresome and exhaustive when prolonged. There are various kinds of foot baths; authorities differ as to their value. Hot water enlarges the feet by drawing the blood to them; when used they should be rubbed or exercised before attempting to put on a tight boot. Mustard and hot water in foot bath will sidetrack a fever if taken in time, cure a nervous headache and induce sleep. Bunions and corns and callousness are nature's protection against bad shoe leather. Two hot foot baths a week and a little pedicuring will remove the cause of much discomfort.

A warm bath with an ounce of sea salt is almost as restful as a nap. Paddle in the water until it cools, dry with a rough towel, put on fresh stockings, have a change of shoes, and the woman who was "ready to drop" will have a very good understanding in ten minutes. The quickest relief from fatigue is to plunge the foot in ice cold water and keep it immersed until there is a sensation of warmth. Another tonic for the sole is a handful of alcohol. This is a sure way of drying the feet after being out in the storm. Spirit baths are used by professional dancers, acrobats, and pedestrians to keep the feet in condition.—*Pacific Record of Medicine.*

THE *Electrical Review* thinks that some simpler device for controlling the brakes and current on trolley cars is required. As it is now, the mechanism is too complicated, there are too many motions to be made by the men in charge; for it is only by the quickest movements that they are enabled to control their cars in a short time.

AN IMPROVED POST OFFICE BOX.

The illustration represents attachments for post office boxes arranged in tiers, whereby the proprietor of a box may readily see when it contains any mail matter, but no one can look into the box. The improvement has been patented by Mr. Henry A. Sheldon, Arcadia, R. I. The swinging doors at the front ends of the boxes have each a horizontal slot in which appears the word "full" or "empty," carried by a sign on a plate which moves vertically between the door and inside guide bars. The latter are curved over the

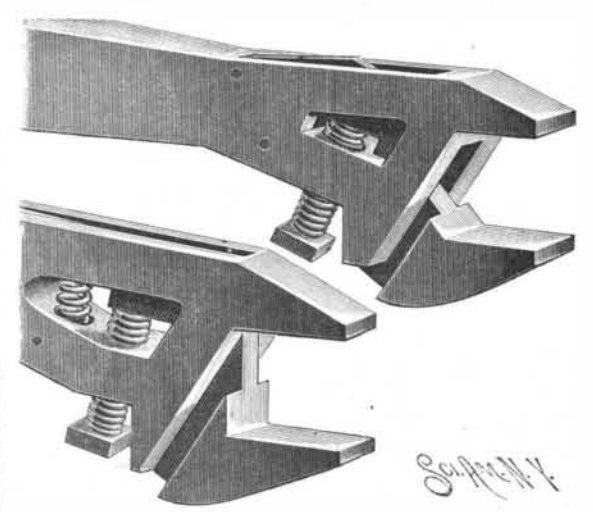


SHELDON'S POST OFFICE BOX.

top of the sign, limiting its movement, and the sign is carried by swinging rods or levers fulcrumed in hangers suspended on a cross rod extending transversely through the box near the center and top. A platform in the lower rear portion of the box is suspended from the rear ends of the rods or levers by means of hangers, and the sign is slightly heavier than the platform, so that when there is nothing on the platform the sign will drop to display the word "empty," but when any mail matter is placed in the box the platform is tilted and the sign "full" is exposed in the slot in the door. The improvement may be readily applied to any ordinary post office letter box, the sign being always automatically operated.

AN IMPROVED WRENCH.

The illustration represents a very simple and durable wrench adapted for use wherever an ordinary monkey wrench may be employed, as well as in some places where the latter tool could not be used. It has been patented by Mr. Edward P. Jones, No. 18 Armat Street, Germantown, Philadelphia, Pa. In one view the jaws are constructed to take a polygonal nut and in the other to receive a square nut. The handle of the wrench is formed integral with its upper outer end and jaw, and the lower forward portion of the handle has a downwardly extending lip, the lip being provided with a more or less angular chamber. The lower jaw is vertically adjusted by means of a screw passed through a threaded aperture in the under surface of the handle back of the lip, the upper edge of the screw engaging with the under face of the head section of the lower jaw shank. When the jaws are shaped to receive a polygonal nut, the handle is placed at an angle of fifteen degrees to the jaw, and where the jaws are



JONES' WRENCH.

formed to receive a square nut, the handle is placed at at angle of about twenty-two and a half degrees to the jaws, this relation between the jaws and handle having been found in practice to be most advantageous for manipulating the wrench in the smallest possible space.

THE first tunnel for commercial purposes was executed by M. Riguet, in the reign of Louis XIV., at Bezieres, France.