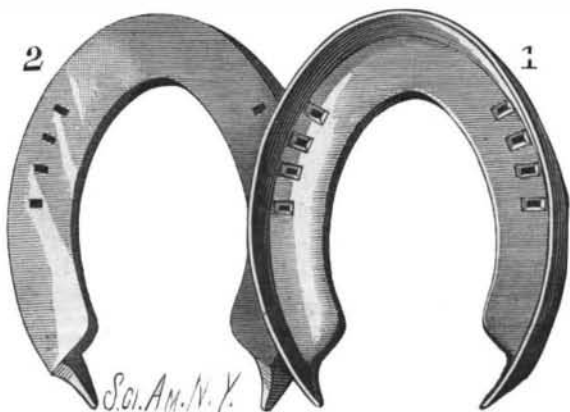


The Proper Weight of Man.

Professor Huxley asserts that the proper weight of man is 154 lb., made up as follows: Muscles and their appurtenances, 68 lb.; skeleton, 24 lb.; skin, 10½ lb.; fat, 28 lb.; brain, 3 lb.; thoracic viscera, 3½ lb.; abdominal viscera, 11 lb.; blood which would drain from the body, 7 lb. The heart of such a man should beat 75 times a minute, and he should breathe 15 times a minute. In 24 hours he would vitiate 1,750 cubic feet of pure air to the extent of 1 per cent. A man, therefore, of the weight mentioned should have 800 cubic feet of well ventilated space. He would throw off by the skin 18 oz. of water, 300 grains of solid matter, and 400 grains of carbonic acid every 24 hours; and his total loss during that period would be 6 lb. of water and a little more than 2 lb. of other matter.

AN IMPROVED HORSESHOE.

The improved form of horseshoe shown in our illustration is the invention of Mr. James S. Charles, lock box 694, Omaha, Nebraska. In the first figure the under side of the shoe is represented, and in the second the top view. The body of the shoe is provided with a continuous, vertical flange, which has its edge sharpened and hardened by means of a new process devised by the inventor. The flange extends somewhat beyond the ends of the main body of the shoe, and is beveled into a sharp point. This feature is intended to give the shoe a greater hold on the roadway than can be obtained by the ordinary construction. The nail holes formed in the web are countersunk, as shown. They have their longer dimensions radiating toward the center, so that the thin part of the nail shall enter the hoof in the direction of its fiber, and do as little injury as possible. By driving the nail in the line of least resistance, the labor of shoeing is reduced, and there is less danger of splitting the hoof. While this form of nail hole is not essential to the invention, it is regarded



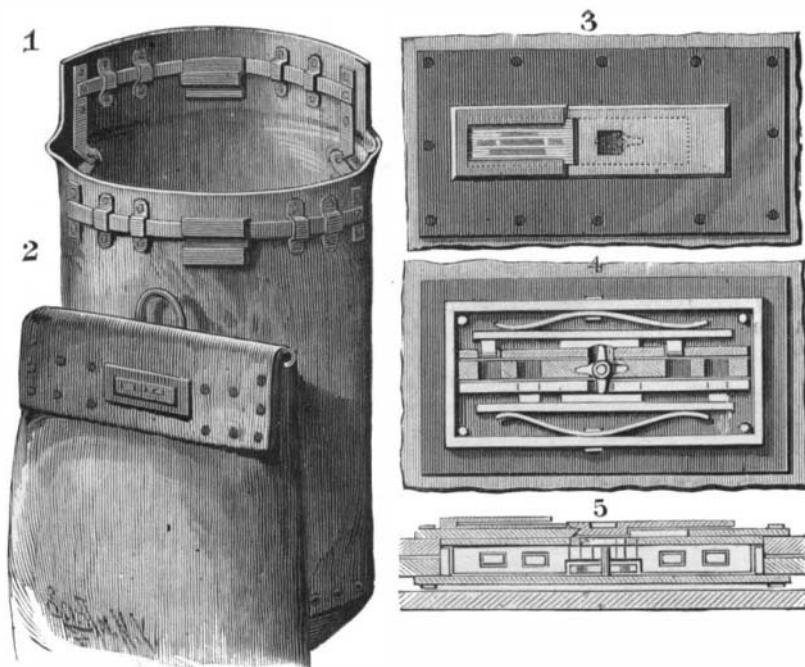
CHARLES' IMPROVED HORSESHOE.

as much the preferable construction. Should it be desired, however, the shoe may be made with the ordinary openings.

IMPROVED MAIL BAG AND LOCK.

The accompanying illustrations show a mail bag and lock designed to do away entirely with the long strap, the staples, and the padlock heretofore used, substituting a lock which becomes a part of each mail bag, and is never detached therefrom. Figs. 1 and 2 show the bag open and closed, Fig. 3 is an enlarged face view of the lock, Fig. 4 showing the same with the front plate removed and parts shown in section, while Fig. 5 is a longitudinal sectional view. The bag has springs on the inside of the flap, and permanently attached thereto, to keep the mouth of the bag open when the flap is raised, thus holding it in the best position to facilitate the emptying and filling of the bag with mail matter. The lock is simple in construction, and perfectly solid when closed, so that if run over by a wagon it will not be injured. It is difficult to pick or force open in any way the locking bars carrying lugs, and being pressed by springs against recessed partitions of the lock casing. On the top surface of the front plate undercut ribs are formed for receiving and holding a ticket on which may be printed the station to which the pouch is to be returned, or the postal division, etc. The lock casing is attached to one flap of the bag, and the top plate to the other. The bag is locked by a slight pressure on closing, and the lock, springs, hinges, and swivels surrounding the mouth of the bag cannot be cut or removed by any ordinary means. This improvement is applicable, at but moderate cost, to all the old mail bags, while it can be applied to all new ones at an expense not to exceed that incurred for the present unsatisfactory fastenings.

These inventions have been patented by Mr. Dennis P. Brophy, of Nokomis, Ill.

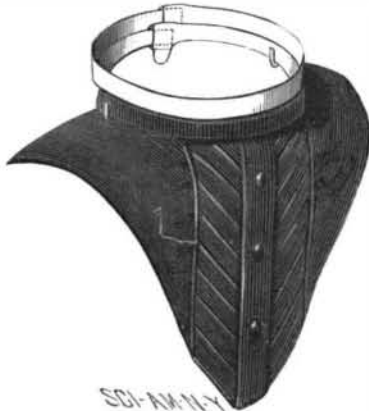


BROPHY'S IMPROVED MAIL BAG AND LOCK.

Access to the back combustion chamber is had by means of a manhole in the rear head of boiler, through which the exhaust nozzles and lift pipes are put in position. The lower or 2 in. tubes are arranged as in the ordinary locomotive, while the upper or 3 in. tubes are grouped around the dry pipe as it passes from the

STOCK AND COLLAR.

This invention particularly relates to stocks and collars such as are used by clergymen, in which a band-like collar, designed to encircle the neck and opening at the back, is used and combined with a stock usually made to present a black fall in front and to expose a portion of the collar above it. One end of the collar is formed with a pocket that receives the other end when the collar is placed around the neck. This construction forms a ready means for putting the collar on and taking it off, and also gives an easy or yielding fit, and adapts it to different sized necks; it also provides for expansion of the collar without exposing a break where the two ends meet. An inner encircling spring serves to support the collar and give it elasticity circumferentially. This spring forms part of the stock, the material of which covers it; one end of



the spring enters a socket in the other end. The stock is also made with an outer black strip, above the fall, arranged to encircle or partly encircle the collar, which is exposed above it. The collar and stock are held firmly together, but may be easily separated when necessary. It will be seen that the stock and collar present a neat appearance, and the latter is free from the unsightly break so common in articles of this description.

This invention has been patented by Mr. B. J. Kolb, of Glandorf, Ohio.

The Coventry Locomotive Boiler.

At a recent meeting of the Engineers' Club at Philadelphia, Mr. John T. Boyd presented an illustrated description of the "Coventry" locomotive boiler, which is probably the latest novelty in locomotive construction.

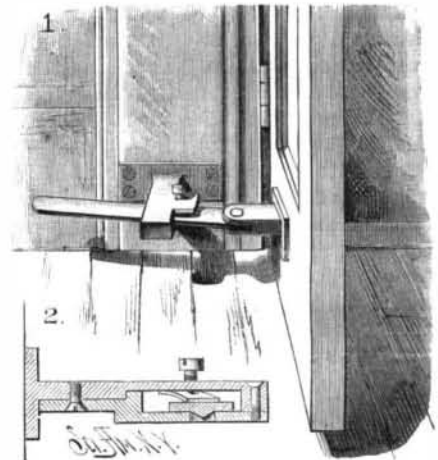
It was built at the Brooks Locomotive Works, Dunkirk, N. Y., and placed on one of their standard 17 in. by 24 in. engines, with 61 in. drivers. The economy of the boiler as a steam generator has not been made public, but while in service on the New York division of Penna. R.R. it has proved to be almost absolutely free from smoke and cinder discharging qualities. The boiler is of the straight top return tubular type, is made of Otis steel throughout, and is remarkable in having but two barrel sections, excluding the smoke box. The stack is "behind instead of before," and is located over the front end of what might be called the upper crown sheet, which forms the bottom of the back combustion chamber, which is directly over the fire box, the stack itself rising from top of boiler between the cab and dome. The crown sheets are self-sustained by long stay bolts opposing the pressure in inside of boiler.

dome to the "T" head in smoke box. In order to get the exhaust steam from the cylinders into the stack, side pipes, provided with expansion joints after leaving the smoke box, are placed outside of but close to the boiler jacket, and enter the back combustion chamber close to the base of the stack.

The throttle lever is turned "upside down" to get a pulling motion to open the throttle, and the rod is forked to pass around stack at its base in order to reach the bridge pipe at dome. The steam supply for injectors, air brake pump, heater cocks, cylinder oilers, blower, etc., is brought from bridge pipe in two pipes, one on each side of boiler. The mud ring in water leg is shaped to take the curved sides of the back head, and allow the outside side sheets of the fire box to lie straight against the edge of the ring, thereby reducing "scarfing" the edges of the back head to a minimum, if not dispensing with the "scarfing" altogether. The boiler is 61 in. in diameter, 23 ft. 4 1/8 in. long, and is of 1/2 in. steel. The barrel contains 152 2-in and 43 3-in. tubes, each 11 ft. 5 1/2 in. long. The fire box is 5 ft. 10 in. long by 34 in. wide, and crown sheet about 4 ft. above grates. Total heating surface is about 1,265 sq. ft. Weight of boiler alone is 23,000 lb.

DOOR CHECK.

The device herewith illustrated holds the door open when desired, and yet does not interfere with the opening and closing. Secured to the door frame, near the floor, is a plate from which a flat jaw projects horizontally, the top of the jaw being provided with a lug projecting toward the door. In the jaw is an opening, through which is passed a flat bar, one end of which is pivoted in jaws projecting from a plate secured to the door. In the bottom of the opening is a hole for receiving a beveled nipple on the under side of the bar,



MAURER'S DOOR CHECK.

as shown in the sectional view, Fig. 2. A flat spring provided with an adjusting screw presses the bar down. When the door is being opened or closed, the bar slides through the opening; and when the nipple enters the opening, it is pressed into the hole by the spring and the door held. By exerting sufficient power the nipple can be pulled out of the hole, when the bar is free to slide in the opening. The pressure of the spring on the bar produces enough friction to prevent the door swinging too easily. The door can be held open more or less by placing the nipple at different distances from the end of the bar.

This invention has been patented by Mr. Adam Maurer, of 210 Elm Street, San Antonio, Texas.

Caution to Amateur Electricians.

Certain printed instructions for the preparation of the chromic acid solution for batteries direct that the sulphuric acid be poured into hot solution of potassium dichromate; unless this be carefully done, small portions of the oil of vitriol may be projected into the face of the operator. Bunsen's method is preferable; mix the dichromate, in granular form, with the sulphuric acid, then add cold water, with continued stirring; the union of the acid and water generates sufficient heat to speedily effect the solution of the salt.

Carp Planted in Rivanna River.

On June 25, 1885, Colonel M. McDonald took from the carp ponds at Washington seventy-five thousand carp from three to ten days old, and deposited them without loss at Charlottesville, Va., in the Rivanna River. The oldest of the fish were from 1 1/4 to 1 1/2 in. in length.

Only a few of the fish died in transit. The river selected is a muddy stream containing no other fish, except suckers. The dams below Charlottesville prevent the ascent of bass and other predaceous fish from the James River.—Bulletin U. S. Fish Commission.