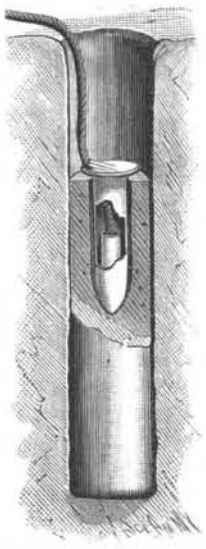
IMPROVED CAP PROTECTOR FOR CARTRIDGES.

A protector and shield for the percussion fuses of dynamite cartridges, to prevent accident in case the fuse fails to explode and it becomes necessary to remove the cartridge, is illustrated herewith, and has been patented by Messrs. Thomas De Coar and William Keast, of Russell Gulch, Col. The shield is pointed at one end and has at the other end a head, slit to form an opening through which the cap is introduced, the cut made by slitting forming a lid which may be bent down to partly close the opening after the introduction of the cap. By the employment of this shield the cap is saved from being injured by tamping, while its efficiency in exploding the cartridge is not diminished, and in case of the failure of the cap to explode it may be safely withdrawn, the head affording facilities for grappling the shield without disturbing the cap.



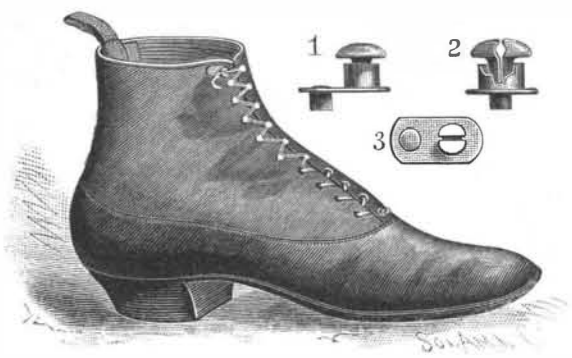
CAP SHIELD FOR CARTRIDGES.

A Large Torpedo Shell.

One of the new elements of construction rendered necessary by the invention of the dynamite gun by Captain E. L. Zalinski has been the need of a brass shell for the projectile. Brown & Brothers, a firm in Waterbury, Conn., have succeeded in making a shell of seamless drawn brass, with conical head, 3-16 inch in thickness, and weighing 200 pounds. Its length is 6 feet 8 inches, and inside diameter 14 inches, the whole being in one piece produced by the cold flow of the metal drawn into shape with the hydraulic ram. This shell is designed for the purpose of carrying 600 pounds of explosive gelatine for the dynamite gun.

AN IMPROVED FASTENING FOR LACING CORDS.

A simple device particularly designed to facilitate the lacing of shoes has been patented by Mr. George M. Sawyer, of Glens Falls, N. Y., and is illustrated herewith. It consists of a lacing fastener having a small flange or plate with a hollow rivet projection on its under side at one end, to be passed through the leather and clinched on the under side, while on the opposite outer surface of this flange is a cylindrical post of a length sufficient to receive one or two turns of the free end of the lacing cord. This post is fitted at its top with a split spring, as shown in Fig. 2, terminating



SAWYER'S FASTENING FOR LACING CORDS.

two opening and closing jaws, adapted to receive the free end of the lacing cord, after the shoe has been laced up, and one or two turns of the cord have been passed around the post.

Defective Chimney Flues.

There is no greater evil in existence to-day in the construction of buildings, says the *Plumbers' Journal*, than the present system of constructing chimneys. The grouping of separate small, narrow, and crooked flues is a great source of complaint in almost every dwelling where so built.

The remedy for same, the editor thinks, would be the construction of one large flue extending from cellar to the highest available point, with branches from each floor running up and connecting at the ceiling of the floor above, or direct at each floor to the main flue. In this manner a guaranteed upward draught at all times would be assured.

Go into any dwelling to-day, and what do you find? For instance, light a fire in the rear parlor, and the draught will be down the front parlor flue, through the hall and room, and up through the rear parlor flue, or *vice versa*, down the rear parlor flue and up the front parlor flue. When that is not the case, on the opening of a window or door, an immediate counter current is the consequence, all which certainly and clearly demonstrates that our method in house construction of chimneys is far from perfection. We calculate by the building of one large main flue, into which all branches should be carried direct from each floor or apartment, is the only safe and true method by which the evil now complained of can be overcome, and the lungs be spared from the poisonous gases they are now forced to inhale, as it is a well known fact that no gases are more poisonous than those of sulphureted hydrogen or coal gas that permeates our dwellings.

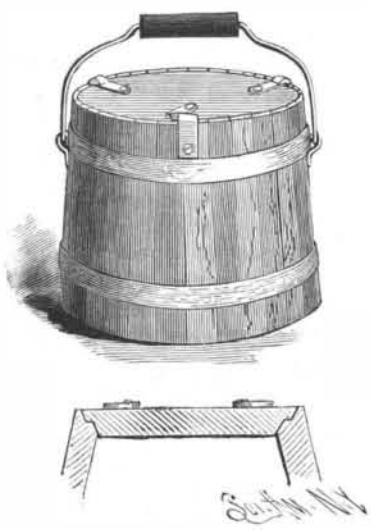
From whence the barbarous practice of constructing our chimney flues in the separate system emanated we know not; but whoever instituted that system, if held responsible for the deaths caused by it, would have a great deal to answer for.

We trust and hope our remarks on this subject will not go unheeded, as a careful observation of any one in their own house will go to prove and substantiate whatever we claim. We need not carry the examination into any other house, but look in our own to satisfy ourselves of the glaring and dangerous defects, as demonstrated herein. We have but to apply the simple principles in ventilation to prove our assertion. As rarefied air expands, it therefore requires a greater area of space in order to travel upward. This principle is wholly ignored in the construction of our chimneys.

What the objection can be to one large flue with an area guaranteeing an upward current at all times, we certainly are at a loss to know. In the good old days of yore we frequently heard it said that we had healthy homes and less sickness than at the present day. In those days we had flues constructed of the capacity that we speak of, that always guaranteed ventilation and pure atmosphere to breathe. Therefore, let the separate flue system be condemned at once, and we will have stronger walls, purer air, and healthier homes, and plumbing would come in for less misapplied complaints, when in reality the cause emanates from the defects we speak of.

AN IMPROVED BUTTER TUB.

A butter tub having an air tight cover, and provided with a simple and effective fastener, is illustrated herewith, and has been patented by Mr. Alexander C. Howe, of Idana, Kansas. The chine of the tub is grooved, or made in two diameters, and is flared outwardly to receive the beveled rabbeted edge of the cover, arranged to fit tightly in the grooved chine of the tub, so that when pressed down into place it will be practically air tight. Near the rim of the tub are fastened right-angled clips which extend over the chine, and to the top of the cover are pivoted latches with beveled ends, adapted to wedge under the ends of the clips, thus forcing the cover downward into the chine, and holding it securely in place.



HOWE'S BUTTER TUB.

Six-Wheel Trucks for Freight Cars.

At a recent meeting of the Western Railway Club, Mr. J. N. Barr read a paper as above. The arguments in favor of such a construction were:

First.—It is very likely that a much smoother riding car would be obtained. This would have a beneficial effect on the entire structure. For some kinds of traffic, as live stock, an improvement in the motion of the car would be a decided advantage.

Second.—The increase in bearing surface would not be affected by increased velocity of the bearing surface, as is the case when the journal diameter is increased.

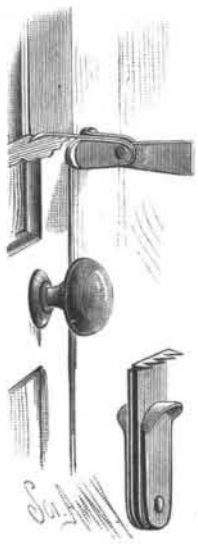
Third.—It is generally conceded that wheels under cars of 40,000 pounds capacity are subjected to a service very nearly equal to their safe limit of strength. The addition of two more wheels will distribute the load of the heavier cars, so that no heavier duty will be required of the wheels as a whole.

This difficulty might be met, to a certain extent, by increasing the weight of the wheel. The increased pressure between the wheel and the rail, however, will, in four-wheel trucks, cause much more rapid wear in the wheels, and likely in the rails, and will also enhance decidedly the effect of any flat spots or irregularities in the wheel or in the track. In the six-wheel truck the distribution of the load will have a tendency to reduce the causes of destruction just named.

Fourth.—In the case of breakage of wheels or axles, the tendency to derailment and extensive damage is very decidedly in favor of the six-wheel truck. In fact, with a good six-wheel truck the liability to derailment in case of a broken wheel or axle is not great, while with four-wheel trucks such breakage will almost certainly produce derailment.

AN IMPROVED DOOR FASTENER.

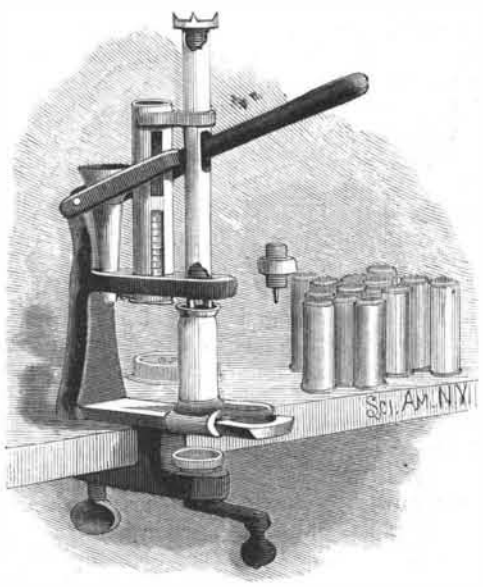
A door fastener which is adapted to be caught in the crack between the door and jamb, so as to hold the door closed without reference to the lock or bolt, has been designed by Mr. Edward Kendall, of McCook, Red Willow County, Neb., and is illustrated herewith. It consists of a toothed plate with pivoted abutment plates and a wedge plate, the device being shown folded in one of the views. To apply the fastener, the toothed plate is opened out singly and laid against the rabbet in the door jamb, with its teeth toward the jamb, when the closing of the door forces the teeth into the wood of the jamb, and the outside abutment plates are turned over against the door and door casing. If the crack between the door and its jamb is very large, the wedge plate is also turned over parallel with the back of the toothed plate. The device is especially designed to be used in hotel rooms and other places where the lock of the door is liable to be picked or opened with a false key after having been locked on the inside.



KENDALL'S DOOR FASTENER.

A COMBINATION TOOL FOR LOADING CARTRIDGES.

A machine for loading the ordinary form of paper shell cartridges, whereby the exploded primers may be removed and new ones applied, and the shell loaded and crimped, is illustrated herewith, and has been patented by Mr. Francis P. Devens, of No. 1306 Forest Avenue, Kansas City, Mo. In loading cartridges, the shells are passed up through the aperture in the forward end of the clamp plate into the shell tube, which is then moved back so that its upper end will be beneath the funnel-like filler at the rear. The proper charge of powder having been supplied, the tube, in being moved forward to the position shown in the illustration, withdraws a wad from the central wad tube, which is forced down within the cartridge by the depression of the lever. The capping and decapping device, which screws into the lower end of the plunger, is shown in a small figure, its convex upper face being used for capping, while the projection carrying a pin is adapted to remove an exploded primer from the anvil of the cartridge. If two wads are to be placed on top of the powder, the shell tube is again passed under the wad tube, when another wad is extracted and pressed home by the plunger as before, after which the shell tube is passed back to the funnel-like filler for its charge of shot, extracting another wad as it is again moved backward, which is forced to place in a similar way. The crimper consists of a block mounted on a short shaft supported beneath the forward end of the clamp plate, there being an annular groove in the upper face of the block, and its lower edge being formed of cam faces, the shaft being operated by a crank arm. The open end of the cartridge is first depressed by a claw adapted to engage with the thread of the plunger, so that it will enter the annular groove in the upper face of the crimping block, when, by a slight downward pressure on the lever, at the same



DEVENS' CARTRIDGE LOADER.

time rotating the crank arm, the edge of the shell will be turned over and properly crimped. As will be seen, this implement may be used as a loader, a capper and decapper, and as a crimper.

THE Springfield (Mass.) Foundry Company, in a circular, remind their workmen that "the average loss on a bad casting is from five to seven times the profit on a good one."

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