

landlord; the tenant must be made liable to summary punishment for breaking or neglecting the sanitary apparatus provided for his use. This will be a proper subject for clauses in a revised Sanitary Act.—*London Gas Light Journal*.

### BREECH-LOADING RIFLES.

The following practical remarks of the *American Artisan*, are worthy the attention of the military and other authorities having charge of our country's defence:—"Now that it is fully decided that the breech-loading gun is wholly to take the place of the muzzle-loader, the next great contest will be between the single shot and the magazine arm. That both kinds have their advantages and each has its advocates we will not deny, but the question at issue seems to be which arm is best adapted for the use of the American soldier. If it be necessary to throw a sudden shower of lead upon an enemy, then the magazine arm must have the preference; but the consciousness of being able to thus hurriedly project a couple of dozen balls, in rapid succession, without stopping to reload his piece or scarcely move it from the shoulder, will render the soldier reckless of his ammunition and careless of his aim, and an enemy knowing this, would take advantage of the lull in the firing that would be requisite for the soldier to fill the magazine of his gun, and would throw his whole force upon him and, as a result, the effort to repel his advance would be feeble and soon broken. But to the skillful and carefully trained soldier, who occupies the extreme of an advancing line, or who is advancing as a skirmisher, the magazine gun will be of great advantage. For cavalry, whose movements are quick and whose fire is to be momentary and rapid, there can be no better weapon of offense or defense than the magazine gun, and by the time that the magazine supply is expended they will have carried their point and obtained their object, or they will have retired beyond the reach of fire.

Let the main body of infantry be armed with a strong, simple, and easy-working breech-loader, of but a single shot between each manipulation for loading, and they will learn that upon that one shot may depend the fate of a day or the turn of a battle, and they will soon exercise care in firing and precision in their aim. The soldier then is conscious of his ability to fire any number of shots at regular intervals, and can continue to do so until his store of ammunition is expended. There will then be no long interval or lull in the firing of a body of troops, and an enemy knowing this will not seek to draw their fire as might be done in the case of magazine guns.

We repeat, the main body of an army should be armed with single shot, breech-loading rifles, and as their movements upon an enemy or retreating from him must be constant for some time, this form of rifle will enable their fire to correspond with their movements, steady and unremitting. Cavalry, as we observed, whose movements are quick and sudden, who are seldom long under fire, must of a necessity be armed with a magazine gun. We have seen, in the history of the arms given to our cavalry, that the muzzle-loading "horse-pistol" was thrown aside for the Colt revolver, as a far su-

perior arm. The muzzle-loading percussion rifled gun was also given to the mounted man as a weapon superior to the flint-lock smooth-bore of the infantry soldier. There was, however, one merit which the old horse-pistol had which we always admired, and that is it carried the same sized ball and cartridge that the rifle did, and one cartridge-box would serve for both arms. In the army of a nation there ought to be but one size of bore and one kind of ammunition for the rifle and pistol, for both infantry and cavalry.

As artillery supports are often broken or artillery is without its infantry support, and as a consequence cavalry may drive them from their pieces, or their guns be captured, we would advocate giving the magazine gun to the artillery, or to a portion of them at least. The drivers, in particular, should carry the same weapon as a cavalryman; for if a cavalry charge be made upon artillery, a shower of bullets from a few magazine rifles may tend to check them for a moment and produce a slight confusion, and then a few shells or well-directed charges of grape or canister will turn their line into broken ranks and their confusion into a hurried retreat."

### WHAT IS CLAY.

On the table before us, lies a bright piece of sheet metal. It is not as bright as silver, and it has not the intense blue tinge that distinguishes zinc. Its surface soon get soiled and dull, otherwise it would probably assume a place as one of the precious metals. But nitric acid, in which silver dissolves almost as easily as sugar does in water, has no action upon this metal, and beyond the first mere dulling of the surface it remains for years without rusting or tarnishing. But by far the most singular feature of the metal before us is its lightness, or as a chemist would say, its low specific gravity; for while osmium, the heaviest body in existence, is nearly 21½ times as heavy as water, silver ten times, lead eleven times, steel eight times, and zinc nine times, aluminium is only two and one half times as heavy as water.

Hence a teapot made of aluminum would weigh but one-fourth that one of the same size made of silver would do, and this property of the metal has caused it to be used in France in the construction of helmets and of the eagles which surmount the standards of the Imperial forces, it being of great consequence in these cases that the weight to be carried should be diminished as much as possible.

As yet, however, this beautiful metal, of which the soil beneath our feet may be regarded as one vast mine, has not been brought into anything like general use, and we presume that many of the readers of this article have never seen it. It has, it is true, been made into spoons, which have been sold as curiosities, but the only really useful purpose to which it has been applied in ordinary life is the manufacture of pens. For this purpose we understand aluminum is but little inferior to gold.

One gentleman in England took a brick from an old Roman wall and extracted from it a sufficient amount of aluminum to manufacture a pen, with which he wrote a very interesting book.

But although in those days a metallic base is an attractive subject, we must pass on. When this