

## MISCELLANEOUS INVENTIONS.

Charles V. Petteys, acting assistant surgeon U. S. A., stationed at Fort Robinson, Nebraska, has invented a new and improved horse litter, the object of which is to provide for army use an improved travois or horse litter, of light draught, and adapted to be folded and packed in small space, and to be readily extended when required for use; also adapted to support the sick or wounded in comfortable horizontal position, and with the least possible jar or jolt while passing over rough ground.

Mr. James W. Ripley, of Columbia, Mo., has invented a fastening for packages of letters and like mail matter in the postal service. The object of this invention is to save time and material in securely fastening such packages. It consists of a plate having hooked end and button, in combination with a cord, for securing a package.

Mr. Samuel H. Gregg, of Crawfordsville, Ind., has patented an improved barbed fence wire. The object of this invention is to make a fence wire so as to enable it to be under proper tension at all seasons of the year, so as to avoid snapping caused by the too great tension from contraction in winter; and also to avoid sagging or looseness caused by the expansion and relaxation of tension in summer.

Mr. Henry R. Gillingham, of Baltimore, Md., has patented an improvement in locking devices for demijohns, bottles, etc., designed to prevent the wasteful, injurious, or unauthorized use of wines and liquors, and to provide greater security for poisons. It consists in providing the old rotary plug valve with a peculiar locking device specially adapted to a receptacle of this kind.

An improvement in egg testers has been patented by Mr. Walter S. Burnham, of Ashtabula, O. The invention consists in the combination, with a box or vessel having a mirror at the bottom, of a disk or plate provided with rim and holes.

An improved key for opening and closing the cocks of water pipes, gas pipes, etc., when placed below the surface of the ground, has been patented by Mr. Patrick H. Regan, of Nashville, Tenn. It is so constructed that it may be extended and contracted, as the depth of the pipe may require.

A radiator formed of a number of radiating sections, into which smaller tubes are inserted, so that the steam occupies the space between the inner tubes and outer sections, and the air can circulate through the inner tubes and around the outer sections, has been patented by Messrs. George P. York and William H. Wilson, of Westfield, N. Y.

Mr. Sanford L. Farrar, of Bath, Me., has invented an improved steam cooker, which consists in the arrangement of two kettles, one on top of the other, the upper one of which has a perforated movable bottom, gutter, and spout, and the lower one is provided with an escape passage, valve, perforated casing, water pipe, and studs, and contains a perforated movable kettle having a perforated removable bottom. The filling tube of the lower kettle is provided with a float and a graduated rod for indicating the quantity of water in the kettle.

An improvement in skates has been patented by Mr. John E. Parmenter, of Fort Pembina, Dakota Territory. The object of this invention is to furnish skates so constructed that they can be very easily and quickly attached to and detached from the boots, and which shall be neat, strong, and durable, and not liable to become accidentally unfastened.

## NEW CANDLESTICK.

We give herewith an engraving of a novel candlestick recently patented in this country and in Europe by Mr. A. J. Smith, of Ukiah City, Cal. The object of this invention is to provide a candlestick that will hold the candle evenly and firmly, and permit of burning the whole of it without waste.

The candlestick consists essentially of four parts—a base or bottom, a hollow standard forming a support for the upper portion of the stick, and at the same time answering the purpose of a match safe, a cap fitted to the match safe, and a sliding sleeve fitted to the cap, and having fingers for grasping the candle.

Fig. 1 shows the candlestick in actual use; in Fig. 2 the upper portion is removed, showing the match safe; and Fig. 3 is a detail view of the upper portion of the candlestick. The slide on the candlestick shown in Fig. 1 has six fingers for grasping the candle, that shown in Figs. 2 and 3 has but three fingers, and the slide is open upon one side to admit of its springing more or less to adapt itself to the part upon which it slides.

The inventor claims several important advantages for this candlestick, among which are the facility with which it may be cleaned, its economy in the use of candles, and its cheapness as an article of manufacture. It will be admitted that this is a marked improvement over the ordinary article. Any further particulars relating to this invention will be furnished by the inventor, who is willing to dispose of his American and English patents.

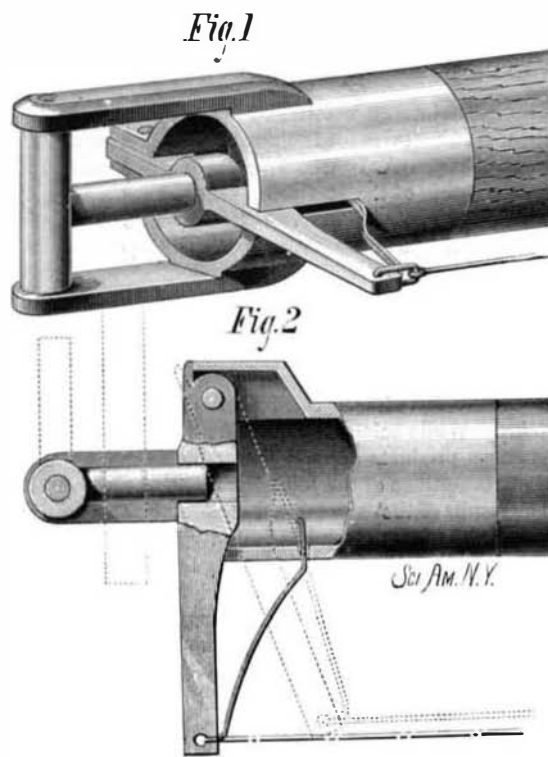
To NEUTRALIZE the sting of a gnat or mosquito, French sportsmen rub the part affected with a little *cerumen*, that is, the wax of their ear, extracted by the little finger.

## NEW HORSE DETACHER.

It is estimated that the percentage of persons killed while riding after horses is fifty times greater than that of travelers killed by railway accidents. Although this statement may appear incredible, it has been carefully verified by competent persons. These accidents occur from various causes, one of the most frequent being the result of the animals becoming frightened and rushing headlong at a runaway pace.

The invention shown in the accompanying engraving is intended to prevent a large class of such accidents by permitting the horses to escape.

The "ever-ready horse detacher," as the inventor calls it, is very simple and capable of instantly detaching the horses. The device is applied to the ends of the whiffletrees, and under ordinary circumstances holds the ends of the traces or tugs in the usual way.

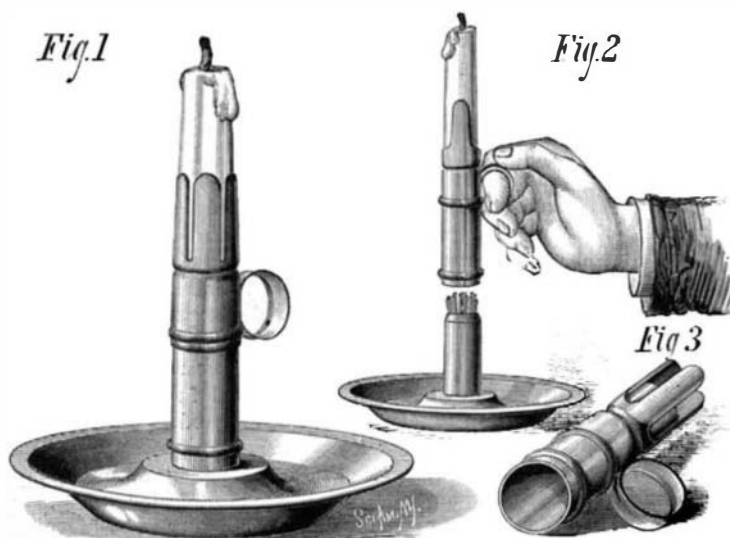


KITCHEN'S HORSE DETACHER.

A clear idea of the construction of the detacher will be obtained from Fig. 1, which shows a ferrule having two projecting arms, between which is pivoted a bar carrying a tongue extending through the eye of the tug and received by a socket formed in a lever pivoted in the ferrule, and pushed outward by a spring which prevents it from becoming accidentally loosened. To the free end of the lever is connected a cord running to the center of the whiffletree, through a ring thence upward to the box within easy reach of the driver. In case of accident the lever is drawn backward by the cord, as indicated in dotted lines in the sectional view, Fig. 2. This releases the tongue that holds the tugs and permits the horses to escape.

## Destruction of Cast Iron Gas Mains.

A curious case of deterioration of cast iron gas pipes has recently been observed at Saarbrücken. The pipes in question had been laid for ten years, and when removed were



NOVEL CANDLESTICK.

found converted into a soft substance which could be cut with a knife, and, on analysis, was found to contain only 52 per cent of metallic iron. The pipes were laid in channels cut in soft sandstone, filled in with ashes from locomotives. The coal which produced these ashes was from the Saarbrücken basin, and was relatively rich in sulphur. The destruction of the pipes was most probably due to the action of the sulphur contained in the ashes, combined with the oxygen of the atmosphere. This view is supported by the fact that the substance into which the pipes had been changed

contained one and one-third per cent of sulphuric acid. A large number of pipes were completely destroyed, and had to be renewed.

## Compressed Steel.

Application was lately made before the British Judicial Committee of the Privy Council by Sir Joseph Whitworth, F.R.S., for a prolongation of the English letters patent granted to him on the 24th of November, 1865, for his invention of certain improvements in casting iron and steel, and in apparatus employed for that purpose. The invention, which is very well known, is described, technically, as "consisting in forming and employing moulds of steel, in combination with pressing plungers, in such manner that fluid steel when in such moulds is subjected to very high degrees of pressure." The term of the letters patent expires on the 24th of November. The evidence of Sir Joseph Whitworth was taken before the learned Registrar—Mr. Henry Reeve, C.B.—on the 21st of July last, and was read at length to their lordships. Sir Joseph, having formally spoken as to the utility and novelty of his invention, deposed that before 1865 no such thing as compressed steel was known in the market. Before 1865 there was no getting steel that had the requisite amount of ductility and soundness. Steel of a certain amount of hardness could be got, but not of ductility. For guns, ductility was indispensable; but when ductility was required air cells were liable to be formed. He caused a large ingot of steel to be split open in order to examine the character of the metal. He found the upper part of it full of air cells, and consequently unsound. It was the best steel in the market, Bessemer steel. From these difficulties he directed his attention to improving the manufacture of steel. For many years he devoted his thoughts to it and made constant experiments. Before the letters patent were granted he had made at least 2,500 experiments.

He believed that the use of steel barrels, both for rifled small arms and for rifled guns, was attributable to his adoption of that metal for guns. He knew of no other manufacturer who had advocated the use of steel for firearms. He compared "Damascus metal," so called, with his own. The former burst with 105 grains charge; the latter did not burst at all. The fluid compressed steel was thus very much the stronger metal. His invention consisted practically in employing moulds of steel in which fluid steel was subjected to a very high pressure. Any gases retained in the fluid metal were pressed out, and the particles of the metal were thus forced into the closest possible connection. A pressure of not less than six tons on the square inch was required. The want of steel sufficiently strong to be used with this test delayed his operations for many years. The ordinary steel in the market could not stand the test. At last he made what was known as the 8,000 ton press. His invention was also applicable to cast iron, but it was more advantageous to compress steel than cast iron. Compressed steel was made down to 30 tons strength and 40 per cent ductility.

The demand for the fluid compressed steel was gradually increasing, and accidents had been materially reduced. It was not until 1869—four years after the patent was granted—that he was able to complete his works and apparatus so as to enable him to produce steel in useful quantities. The petitioner then gave intricate evidence as to the accounts kept by the firm as to the profits or losses of the invention.

In support of the petition, Sir John Hawkshaw, Mr. Barlow, C.E., Mr. Hotchkiss, of America, patentee of the revolving cannon; Mr. Wright, engineer-in-chief to the Royal Navy; Mr. Davis, works manager of the Torpedo Department at Woolwich Arsenal; and Mr. Purdey, the gunsmith, were called and gave evidence.

About the year 1863 the business of Sir Joseph Whitworth's then firm was purchased by a company in which he held by far the largest number of shares, and which company became eventually "The Whitworth Company (Limited)." The latter company carried on the business of the firm until the end of 1868, when, having the intention of eventually forming a company of another character which should afford special advantages to those of his workmen who were industrious and well conducted, he purchased all the business and again became the sole proprietor. In 1874 he formed a company called "Sir Joseph Whitworth & Co. (Limited)," of which, as before, he was by far the largest proprietor. It was so constituted that whenever any deserving workman in the employ of the company or firm desired to take shares and so invest his savings, he might do so under conditions that would be specially advantageous to him. The petitioner then described the various modes by which his invention had been brought before the public,

and he contended that he had not hitherto received any adequate remuneration for the labor, time, thought, and capital he had expended. Inasmuch as the great merit of his invention and the necessity of having a metal of great strength and ductility had been demonstrated, Sir Joseph Whitworth prayed her Majesty in Council to grant him a prolongation of the terms of his letters patent.

Mr. Aston, in closing the case, contended that Sir Joseph Whitworth, the petitioner, had done as much as possible to bring his invention before the public and to give them the