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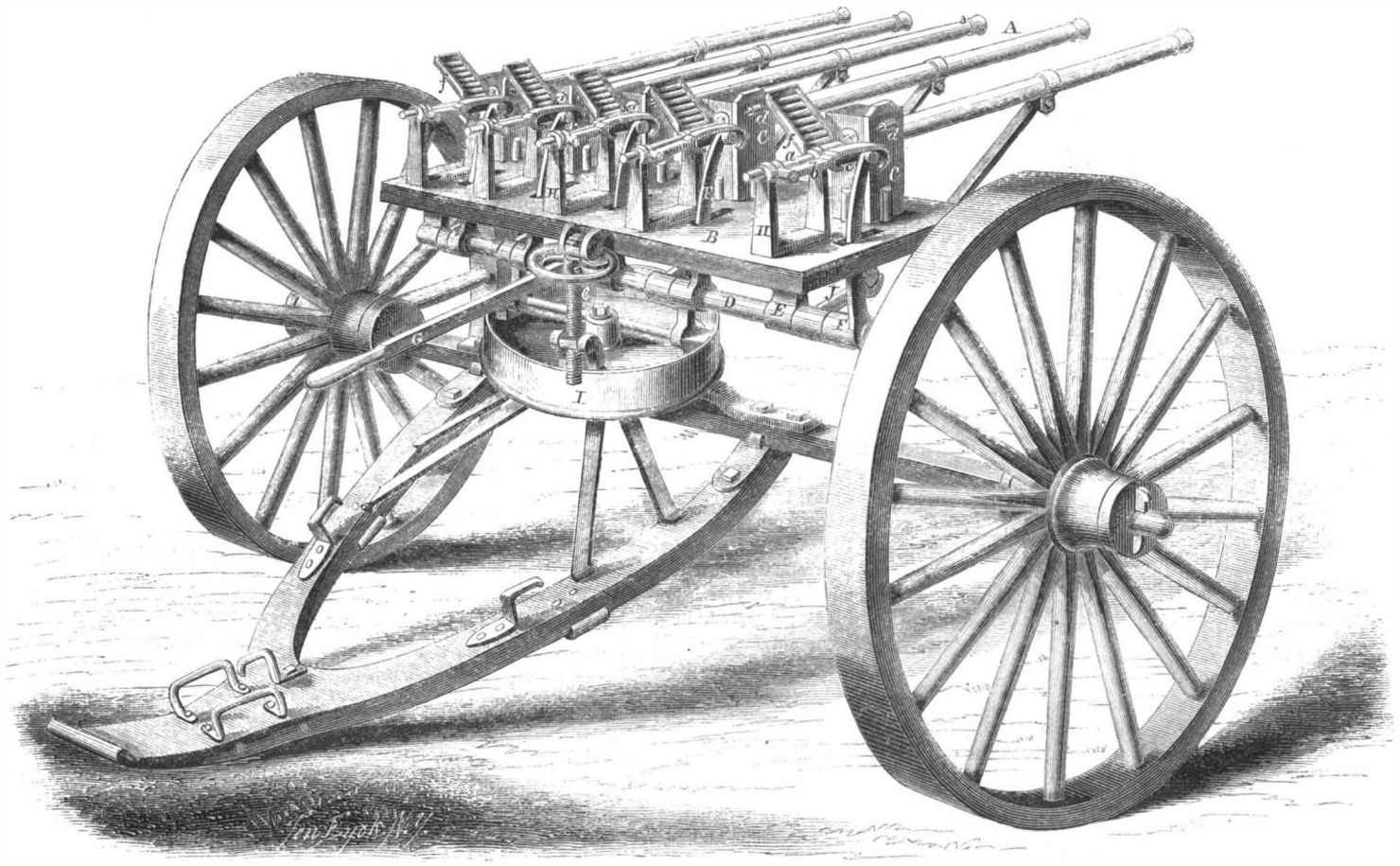

CROZIER'S PATENT AUTOMATIC BATTERY.

The war for liberty and the preservation of the Union, which the North is now engaged in, has brought forth many inventions which otherwise would never have been produced. Guns of all kinds, shot, shell and projectiles without number have been invented and have played a most important part in the fearful struggle at this moment going forward. The weapons most destructive to life have been declared the most merciful, in that they, through this very quality, tend very greatly to a speedy termination of the disputed points between nations. If this assertion be correct, then certainly we must admit that the battery which we herewith illustrate possesses features which will render its adoption by the Government most desirable. If there are any cogent arguments concealed in volleys of bullets, then this new battery will prove a most formidable adversary. The weapon in question is novel in its design and construction; a full description of its details and operation is here appended:—The five rifles, A, Fig. 1, are mounted on the bedplate, B, and secured at the breech to the wrought-iron boxes, C, and in the center by the braces to the bedplate. The shaft, D, is provided with the bearings, E, and carries the arms, F, upon it. This shaft is further provided with the the lever, G, one end of it terminating in a handle that is grasped by the gunner. The stands, H, have holes bored in the upper ends, through which the ramrod, *a*, works. The stands are bolted fast to the bedplate; the ramrod has a small collar secured to t by a set screw, there is a pin attached to this collar, over which the eye of the arm, *b*, is slipped. This arm carries, on the side opposite the reader, the lock.

Fig. 2.

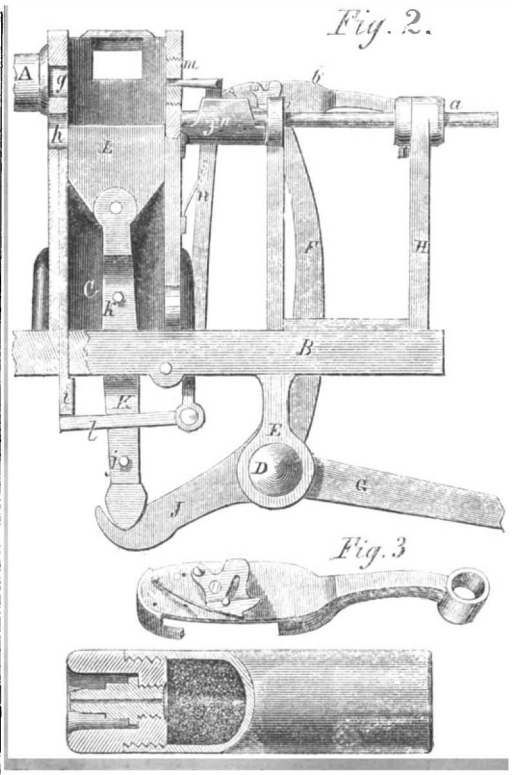

Fig. 3

The long arm, F, has a pin on its upper end, that traverses, by moving the lever, in the recess, *c*. The side of the breech box nearest the reader can be removed by knocking out the key, seen at *d*, and access is then obtained to the internal arrangement of the parts connected with it. Attached to the axle of the battery is the casting, I, having a hub or boss in its center. By taking hold of the lever the whole apparatus may be moved on its center, and the lateral range of the missiles thereby secured. The vertical range is attained by raising or lowering the front edge of the bedplate with the screw, *e*; as it is very close to the center of motion and the muzzles of the rifles are remote from it, the change from elevation to depression can be made very quickly. The hoppers, *f*, containing the cartridges, are slipped over a small sheet fitted to the hoppers; this sheet is bolted to the front of the breech box, and can be seen very plainly in the section Fig. 2, to which we shall now refer.

In this view of the battery the side of the breech box or loading chamber is removed and the details of it exposed to view. The arm, J, connects through the medium of the link, K, with the block, L, to which it is jointed; it slides easily in the loading chamber and is moved up and down, as will be seen, by the long lever, G. The breech of the rifle enters the chamber at *g*; immediately below it will be seen another aperture, *h*, this will be alluded to hereafter. The small slide, *i*, works in a groove cut for it in the end of the loading chamber, and is operated by the pins, *j* and *k*, on the link, K, and the arm, *l*, on a small counter shaft, invisible in the perspective view. The plug, *m*, is screwed into the front of the loading chamber, and is drilled out for the reception of the hammer, *n*, which is in its turn worked by the

lock, *o*, or exploding apparatus on the arm, *b*; the small spring bolted on the front of the loading chamber insures the return of the hammer to its proper position when disengaged by the previous operations. An enlarged view of the lock and the arm to which it is fastened is seen in Fig. 3, as also a cartridge with the nipple end shown in section.

The operation of this novel instrument of defense is as follows:—The gunner takes hold of the lever, having first aimed the rifles by means of the screw in front, works it up and down, and thus discharges the contents of the cartridge case into the ranks of the enemy. As the handle of the lever descends the opposite end is elevated, carrying with it the sliding block. This sliding block has just had a cartridge presented for its consideration, and is conveying the same to the upper end of the loading chamber; so soon as it arrives there the lock is disengaged, the hammer flies in through the aperture, explodes the cap and discharges the barrel. The recess shown on one side of the lock arm is made of the requisite length to secure accuracy in the time needful to the various operations. The small slide rises with the link and presents a portion of its end through the circumference of the lower aperture, so that the cartridge is pushed in just far enough by the ramrod to allow the block to work freely as it rises opposite to the rifle breech. As fast as the cartridges are thrust in, the others above roll down the hopper to the proper position opposite the hole in the loading chamber; on the return of the lever they are pushed in by the ramrod, and this operation also brings down the empty case, the contents of which have just been discharged. The empty case falls out on the other side of the chamber and rolls into the circular box beneath the bedplate; the cases are then re-loaded and are ready for use. The cartridge case is made of stout brass, and is large enough to carry a round ball of an ounce weight, or an elongated projectile of greater weight. All that is necessary, then, in this battery, is to work the handle up and down, and the battery vomits forth a discharge of bullets which is truly terrible to contemplate in its destructive power. It is not at all complicated, and as the motions of the machine are all positive, there is no danger of any derangement. The most ignorant contraband could, with this battery in good working order, slay more rebels than ever Samson slew Philistines with the jaw-bone of the ass.

Further information in regard to this invention may be had by addressing the inventor, A. H. Crozier (who has obtained 13 patents, from which he has realized $285,000), care of Smith, Cooley & Co., No. 236 Washington street, New York City.

Ship-building in Maine.

The State of Maine is distinguished for ship-building, and at the present moment this business appears to be quite active. The Bath (Maine) *Times* reports quite a large number of vessels on the stocks, several of which are nearly completed. It says:—"At Hospital Point, by Lemont & Robinson, a ship of about 900 tuns is being timbered out. At Arnold's yard, Wm. M. Reed & Son have a fine ship of about 1,000 tuns very nearly completed. In the yard formerly occupied by Hall, Snow & Co., preparations are being made by Mr. Orrin Blaisdell to build a barque of 400 tuns, under contract with parties in Bath. J. P. Morse has a keel stretched in his yard, and some frames up for a steamboat, to take the place of the steamer *Seguin*, recently sold. She will be adapted to sea service if needed. Mr. Morse, also, has in his yard a frame for a ship of about 900 tuns, which he is intending to put up as soon as the steamer is completed. Messrs. Houghton & Brothers have a ship of 1,000 tuns timbered out in their yard. Wm. Rogers, Esq., has stretched the keel for a ship of 700 tuns. Messrs. W. V. Moses & Son have a ship of 1,000 tuns on the stocks completed, rigged and ready for launching, called the *Sarah Freeman*. Messrs. E. & A. Sewall have a ship of 1,000 tuns nearly timbered out. In the shiphouse, Messrs. Rideout & Hathorne have a ship of 900 tuns timbered out. The yard of Messrs. Larrabee & Allen presents a scene of unusual activity, there being about 150 men employed. The gunboat *Isco* is fast approaching completion. A brig of 480 tuns is now timbered out in the same yard. Messrs. W. & J. Drummond have in their yard a barque, of 600 tuns, underway. Messrs. John Patten & Son have commenced a ship of about 1,000 tuns in their yard. Thus it appears that ship building in Bath has not been carried on during the winter season to a greater extent for some years past than at present."

Caution to Refiners of Petroleum.

We would direct the attention of all those engaged in the refining of petroleum to the following from the London *Chemical News*:—

It is well known that one of the most objectionable impurities in coal gas is bisulphide of carbon, which, upon combustion, yields sulphurous acid—a gas particularly detrimental to pictures, bindings of books, art decorations and even to delicate constitutions. Numberless have been the expedients resorted to, with a view to get rid of this noxious impurity, and latterly with some degree of success. Nevertheless, the formation of sulphurous acid by the combustion of sulphur compounds in coal gas has precluded its use in many public libraries, picture galleries and in private dwellings.

It is much to be regretted that the rock oil furnished by some refining companies contains a notable quantity of sulphur, either in the form of sulphureted hydro-carbons or sulphuric acid. These impurities generally arise from a neglect on the part of the refiner to remove the whole of the sulphuric acid he employs in his refining process. It is of the highest importance that the sulphuric acid should be abstracted as far as possible; and, although we do not say that during the process of refining some sulphureted hydro-carbons may be produced which, in the present state of our knowledge, it would be impossible wholly to remove, yet from actual experiment we have detected the presence of sulphuric acid in some samples of rock oil, showing that this acid was not wholly withdrawn by the after use of alkalies, washing or other expedients. It is essentially important, in order to produce a good sample of refined rock oil, that the whole of the sulphuric acid should be abstracted; otherwise, during combustion, sulphurous acid will be generated, and a noxious compound very insidious and prejudicial in its effects will be generated, in greater or less quantities, by the use of rock oil. Refiners should satisfy themselves by chemical tests that every trace of sulphuric acid is removed from their samples of oil before permitting them to go to market. Neglect in this important particular may soon engender a distaste for a beautiful and most economical mode of illumination, rendered prejudicial by inattention to simple precautions in refining, which a desire to produce a safe and saleable article ought to ensure. A piece of white blotting-paper, moistened with a solution of iodic acid and starch, held over the flame of a rock-oil lamp, will become bluish-purple, if sulphurous acid is generated during the process of combustion. This test, however, is not sufficient, as there may be other deoxidizing agents in the gases resulting from combustion, which would set iodine free. The samples of rock oil may be tested with a solution of chloride of barium. If the sulphuric acid has not been wholly removed, a heavy white precipitate will indicate its presence. We would recommend refiners always to test their oil after the washing process is completed, to see if the last traces of sulphuric acid have been withdrawn. In some instances which have come under our notice a very marked reaction took place when tested with chloride of barium, as well as decided indications of sulphurous acid in the products of combustion, when a slip of paper, moistened with a solution of iodic acid and starch, was held over the chimney of the lamp.

New Survey of the Atlantic Ocean.

A new survey of the sea-bottom between Ireland and Newfoundland has been made by the British ship *Porcupine*. The primary object of the survey was to ascertain the most gradual slope of the bed of the ocean and the route most suitable for a line of telegraph cable. Two routes have been selected for examination. The first or Galway route presents the greater facilities. For a distance of 160 miles due west from Cashla Bay there was found to be a gently undulating sea-bottom or terrace, having the decline of an ordinary beach. From 100 to 185 fathoms of water rolled above it; the intermediate soundings being 20, 65, 68, 74, 76, 82, 105, 135, and 165. At the western extremity of this terrace rises a bank which is but little more than 80 feet below the surface of the ocean. Beyond this is a descent of 700 fathoms in 10 miles, when the telegraphic plateau is gained—a vast submarine plain, stretching thence to the banks of Newfoundland with a tolerably even depth of two miles of water. The second route starts from Valentia. A valley 525 fathoms deep is first met with. A ridge 25 miles in width rises from the opposite edge of this valley, which ridge is between 195 and 230 fathoms below the surface. At the western extremity of this the bed again declines till the bottom of a second and much deeper valley is found. In this sea-valley the waters are three miles in depth. Beyond this a gradual rise takes place till the telegraphic plateau is reached.

The various objects brought up from the ocean-bed by the sounding machine and dredge have been placed in the care of Professor King of Queen's College, Galway, for examination by the Lords Commissioners of the Admiralty. The surface of the deep-sea bed is one vast sheet of *foraminifera* and other minute structures, whose functions are to clear the waters of the ocean from all mineral and organic impurities. There are perforating mollusks living at great depths; but Professor King does not entertain apprehension that they would bore into a telegraphic cable. He inclines to the belief that the organic accumulations to be expected on foraminiferous bottoms would, in the course of a few years, completely encrust it. The wide bank discovered 160 miles off Galway, called Porcupine Bank, consists of siliceous sand and coarse gravel, with the addition of considerable quantities of the *débris* of shells and other organisms. Pieces of rock, some three or four inches in diameter, are found with fresh specimens of *truncatulina* and various genera of bryozoa adhering to the upper surfaces of them, showing that the water at the comparatively inconsiderable depth where they live is not much affected by storms. Several fishes were brought up by the dredge from the bank surface and about 50 shells, besides sponges, star-fishes, sea urchins and hermit crabs.

A Sensible Project.

The French Government has determined to accomplish a reform in the dwellings of the operative classes in Paris, and is about to commence by the construction of a *cite modèle* on the Boulevard Mazas, for unmarried workmen. The situation is well chosen, being in the center of the manufacturing quarter of Paris. The proposed building is to be five stories high, and each floor is to be divided into small rooms completely separated, and to be approached by a spacious staircase. The ground floor is to be appropriated to a reception-room or common hall, open to all the lodgers, a restaurant or dining-room, an office for the director, and an apartment for the house-porter.

If some persons in this part of the world would adopt this idea, they would, if they managed properly, reap a fitting reward for their outlay of time and money. There is always a large floating population, in this and other cities, of mechanics who desire suitable homes; these are too often unattainable, and we think an institution comprising the features of the French model would be very popular.

Icelandic "Skier."

Their daily food is taken cold, and consists chiefly of raw, dried stockfish and "skier." The latter dish is simply milk allowed to become acid and coagulate, and then hung up in a bag till the whey runs off. In this form it is both nutritive and wholesome, being more easily digested than sweet milk; while, to those who take to it, it is light, palatable, and delightfully cooling. Milk is prepared in this way by the Shetlanders, who, in the first stage, call it "run milk," and when made into skier, "hung milk." The same preparation is made use of by the Arabs, and it is also the chief diet of the Kaffirs and Bechuanas at the Cape. Our idea, that milk is useless or hurtful when sour, is merely an ignorant prejudice. Those who depend for their subsistence chiefly on milk diet, and have the largest experience, prefer to use it sour, and medical authority endorses their choice.

THE New England Pin Company, of Winsted, Conn., is making pins of iron instead of brass. They are also made at Seymour in the same State.