

BREECH-LOADING FIREARMS.

It has been stated by Bayard Taylor and other travelers that a revolving pistol, with one barrel and a cylinder to be loaded in several chambers, is to be found in a collection of ancient armor, in Warwick Castle, England, and that another, of similar design, is to be found among the relics exhibited in the Tower of London. But these remarkable curiosities can scarcely be considered to depreciate the value of the modern breech-loading rifle, the details of which have probably been the subject of as many patents as those of any other appliance. We publish herewith the first of a series of engravings of the many improvements effected during the last few years, which we extract from Mr. E. H. Knight's "American Mechanical Dictionary."*

The Martini gun, A, is the invention of a Swiss. The breech block is pivoted at its upper rear portion, being moved up and down by a lever at the rear of the trigger guard. The firing is by a spiral spring, which actuates a firing pin. The cartridge shell extractor works on a pivot below and behind, the barrel being operated by the descent of the front end of the bell crank lever.

The Chassepot gun, B, is the French arm, and is named after its inventor. It is what we term a bolt gun, an opening on the right hand of the chamber admitting the insertion of the cartridge. The forward thrust of a knob drives the cartridge into the breech, and a partial rotation of the knob locks the breech piece. The firing is by a needle.

The Prussian needle gun, C, is also a bolt gun, having an inner bolt which forms the firing pin, a sleeve around it, and an outer cylinder, the parts are shown with the needle in its fired position. In preparing to reload, the rear knob is withdrawn, and the axial bolt retained by a catch which engages a projection, withdrawing the needle. The chamber is then unlocked by the knob and slid back, the cartridge inserted and driven into the breech by the chamber, which is locked by a partial rotation. The firing is done by releasing the needle bolt.

In Maynard's rifle, D, the barrel is pivoted to the front end of the stock, and its rear end tips upwardly, exposing the chamber for the cartridge, when the barrel is tipped down against a solid breech piece and locked. The Maynard primer consists of pellets of fulminate placed at regular intervals between narrow strips of paper. This is coiled in a chamber in the lock plate, and is fed forward by a wheel operated by a hammer, so as to bring a pellet on top of the nipple at each discharge.

The Merrill gun, E, was constructed for a paper cartridge. The breech was closed by a sliding plug locked in place by a combination of levers. The charge was exploded by a copper cap, placed upon the nipple in the ordinary manner.

The Spencer rifle, F, is both a magazine and a single breech-loader, seven cartridges being placed in a magazine in the butt, and being thrown forward to the chamber as required. The breech block is a sector pivoted beneath the level of the barrel, and retreating backward and downward to expose the rear of the bore for the insertion of the cartridge. The trigger guard forms the lever for moving the breech block.

The Laidley gun, G, has a breech block pivoted beneath the barrel and rotating backward and downward to open the chamber. When in position for firing, it is fastened by a locking brace which is operated by a spring and vibrates on the same axis as the hammer. The breech block is unlocked by a cam and thrown back by a pawl attached to the locking brace and actuated by the hammer.

The Westley-Richards gun, H, is an English arm, having a pivoted breech block whose front end is depressed by the action of a lever pivoted to the stock beneath the rear of the barrel.

The Snider gun, I, built at Enfield, England, is similar to our Springfield converted rifle, which we shall describe in a future issue. The breech block is hinged behind and above the barrel, the block throwing upward and forward, exposing a chamber behind. Into this the cartridge is dropped, pushed into the bore, the block brought down and locked by a latch in the rear. The firing pin passes obliquely through the block, and is struck by the ordinary hammer.

The Berdan form of this type is shown at J, and has a breech block in two sections hinged together.

K is the Peabody gun, which has a falling breech block, hinged at the rear and depressed by the guard lever, whose short arm engages in a recess of the block and controls its movements. When the block is down, the cartridge is slipped into the bore, and the piece is fired by the fall of the hammer upon a firing pin sliding in a groove in the side of

the block. In opening to reload, the block drops upon an elbow lever and withdraws the spent cartridge shell.

The Roberts gun, L, has a breech block pivoted at the rear, operated by a lever which extends backwardly over the small of the stock; the forward end of the breech block being depressed, the center of its motion and its abutment in firing being a concave solid brass centering on the exact prolongation of the axis of the barrel. The breech parts are four in number, articulated without pins or screws. The firing pin passes centrally through the breech block, and is driven forward on the center of the cartridge by a blow of the hammer.

Allen's gun, M, is double barreled, and the breech block is hinged at the side, swinging upwardly and laterally. It carries both firing pins, and is locked shut by a latch.

The first patent in the United States for a breech-loading firearm was to Thornton & Hall, of North Yarmouth, Mass., May 21, 1811. This gun is represented at N in our engra-

Imitation Marble.

Carl Boschau says that if a statue, made of plaster of Paris or *papier maché*, be coated with thick white dammar varnish, and then dusted with pulverized glass, it will have, when dry, the appearance of alabaster. If it be afterwards varnished a second time, and dusted with coarsely pulverized white glass or mica (*marieglas*) and again dried, it will be a very successful imitation of Carrara marble, especially if the marble veins be first traced on it with some delicate blue pigment. This method of preparation follows that of Nature, for alabaster consists of very small crystals of sulphate of lime, and Carrara marble of somewhat larger crystals of carbonate of lime, which in reflected light glisten like white sugar. This effect is obtained with perfect deception by the brilliant white glass in coarse powder.

An Oil Pipe Three Hundred Miles Long.

The Pennsylvania Transportation Company, of which Mr. Henry Harley is president, has been chartered by the State of Pennsylvania for the purpose of transporting oil from the oil regions to the principal Atlantic seaboard cities. The plan proposed is to run the oil through a four inch pipe laid on the surface; the forcing power will be 900 lbs. to the square inch; there are to be stations at distances of fifteen miles, at each end of which an engine of a 100 horse power will be erected to work a pump to continue the flow from point to point. The company having decided upon the construction of the work, the president sought the services of General Herman Haupt. He pronounced the scheme, after a thorough examination, to be entirely practicable, and is now acting as engineer-in-chief. In view of the enormous product of oil in this country—30,000 barrels per day—and the rank it now holds among the leading articles of export, coupled with the exorbitant charges for railroad carriage from the wells to the seaboard, by the completion of the enterprise and its successful operation a complete revolution will be accomplished in the handling of this article. As a proof of how valuable this traffic has been to the several railroads over which the oil has been borne, it is only necessary to say that up to the present time the railroad charges aggregate \$79,000,000. The minimum cost of transporting oil by rail is 50 cents per barrel, and the minimum cost by the pipe process is 16 cents. The average charge by rail is \$1.25.

The estimated cost of the entire work, including fixtures, etc., is \$1,250,000; and considering the difference in cost between this method and that by rail, upon the hypothesis that the company will discount at least 25 cents a barrel on rail rates, it will readily be seen that, with all the expenses of operating, the first year's earnings will pay the first cost of the work. The Pennsylvania Company is the parent company, but there is also the Baltimore Transportation Company, chartered by the State of Maryland, and some five other companies are expecting to unite. The first objective point or terminus will be Baltimore, as being the most feasible and direct route for the pipes. Following which other termini will be established in Philadelphia, New York, etc.

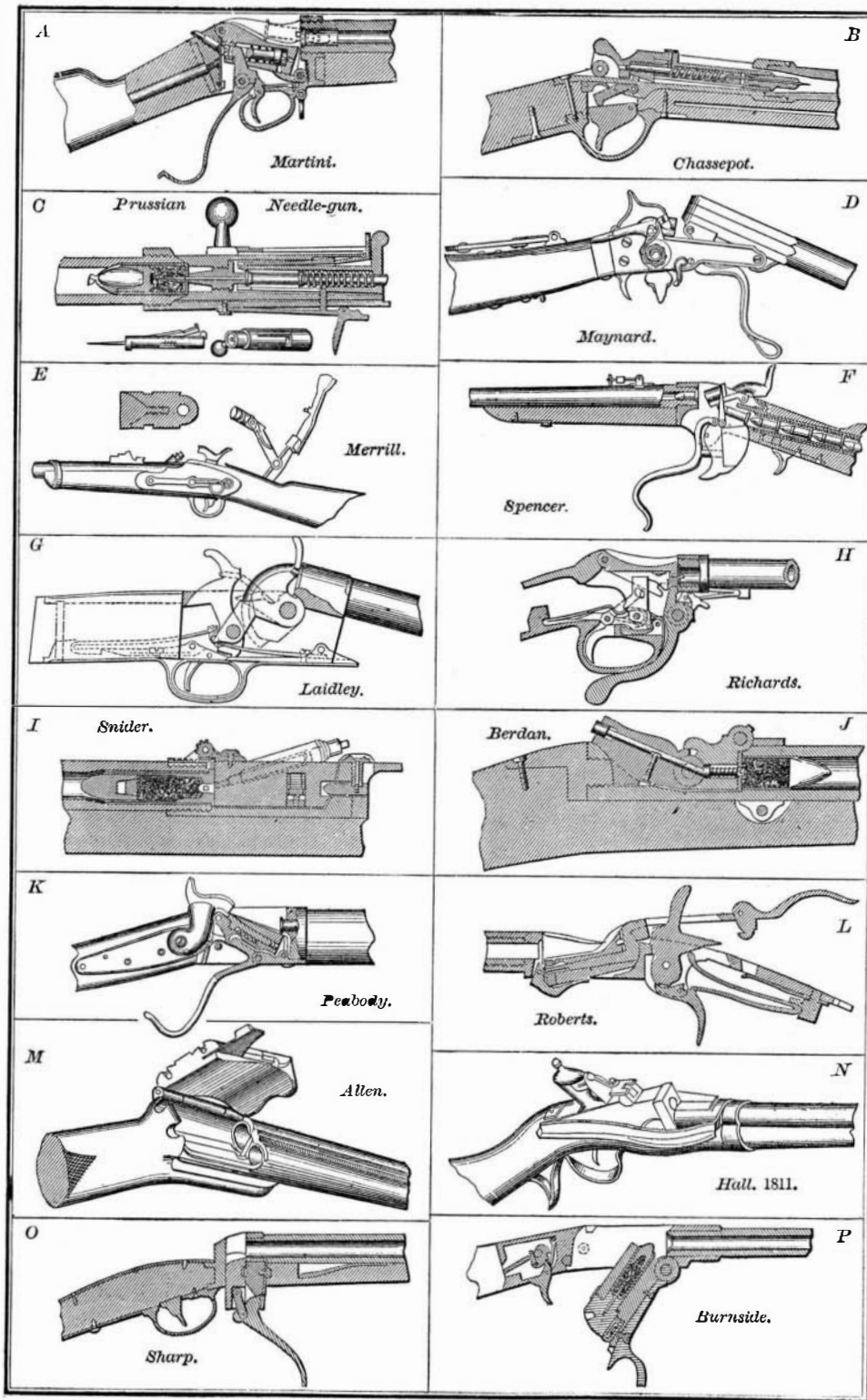
The pipes being laid on the surface, and there being no obstacle in the way of forcing the oil to any height, the line will literally be an air line, and the distance from the oil regions to Baltimore

is 300 miles. The oil will be distributed from the pipes into immense reservoirs, with refining establishments adjacent. Of course the whole railroad system will oppose it, for it is taking from them a traffic from the very nature of which there could be no competition; but the advantage to the oil producers, who will have the entire control, will be immense, and the advantages which will accrue from such facilities to this important branch of our export commerce will be incalculable.

The feasibility of this enterprise, so far as the passage of the oil through pipes is concerned, has been fully established by the present system in operation in the oil regions, where the aggregate length of the pipes conveying the oil from the several wells to the reservoirs is nearly 250 miles. —*Boston Traveler.*

Prizes for a New Bleaching Agent.

A Vienna industrial league offers a silver medal to any one who will discover a method of bleaching every kind of silk perfectly white without the use of sulphur or other chemical injurious to silver. In embroidery and silver lace, where silk and silver are used together, the silver is blackened by the sulphur in the silk. A similar prize is offered for the most beautiful and solid domestic article for weighting light-colored silks.



BREECH-LOADING FIREARMS.

ving, and had a breech block, which was hinged on an axial pin at the rear, and tipped upwardly at front to expose the front end of the charge chamber. The flint lock and powder pan were attached to the vibrating breech block.

Sharps' rifle, O, has the barrel rigidly attached to the stock, the rear being opened or closed by a vertically sliding breech block, which slides up and down in a mortise operated by the trigger guard, which is pivoted at the front end, or by a lever. The primer consists of small pellets of fulminate inclosed in a copper casing so as to be waterproof. These are placed in a pile in a hole in the lock plate, forced upward by a spiral spring, the upper one fed forward by a plunger, caught by the cup of the hammer, and carried down upon the nipple. The cartridge is in cloth, the end covered with tissue paper saturated with saltpeter, through which the fulminate will ignite the powder.

Burnside's rifle, P, has the barrel attached to the stock, the breech piece being pivoted beneath the barrel, so as to swing downward and expose the chamber in the front end of the breech piece for the insertion of the cartridge.

Other forms of breech-loading rifles will be illustrated in forthcoming issues of this journal.

To MAKE a good organ pipe metal, take equal quantities of tin and lead, cast into sheets, and plane smooth.

*Published in numbers by Messrs. Hurd & Houghton, New York city.