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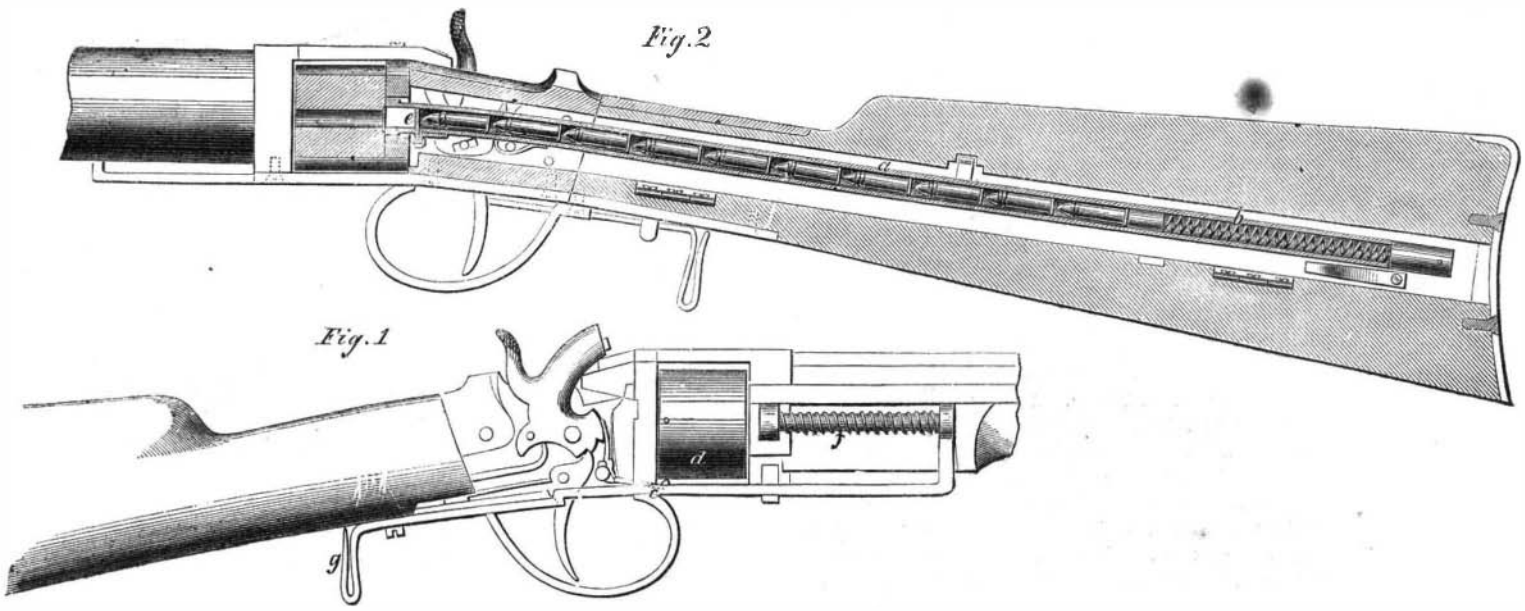
Improved Self-Loading Gun.

The accompanying engravings represent an improved gun, invented by Freeman Brady, Jr., and John C. Noble, of Washington, Pa. The prominent feature of the invention is the use of movable magazines adapted to be carried upon the person and to be readily inserted or removed from a chamber in the stock. By this means as many as twenty shots (the contents of two magazines) may readily be discharged within a minute. The construction will be readily understood from the engravings, of which Fig. 1 is a side elevation, and Fig. 2 is a vertical longitudinal section.

The magazine, *a*, is a long, slender tube which may



BRADY AND NOBLE'S SELF-LOADING GUN.

be placed in a chamber prepared for it in the breech of the gun. Several of these tubes are filled with cartridges and carried upon the person of the soldier or hunter, and when one is emptied it is removed and another inserted in its place. The chamber is opened upon the side of the breech throughout its length, and is closed by a swinging or movable plate. A spiral spring, *b*, presses the cartridges forward, and they are retained in the tube by a gate, *c*, which is removed after the tube is placed in the chamber.

The cylinder, *c*, is a many-chambered revolving breech, each chamber being brought in its revolution to coincide first with the tube, *a*, and afterward with the bore of the gun. When in line with the tube, the forward cartridge of the series is pressed forward into the chamber, and then, as the breech revolves, the cartridge is carried behind the bore, the rotation of the cylinder, *d*, cutting off all communication between the cartridges in the tube and the one to be discharged, and, at the same time securely closing the breech. The cocking of the gun, causes the cylinder, *d*, to revolve through an arc corresponding to the distance from one chamber to the next. This is effected by the point, *e*, catching into one of the holes in the periphery of the cylinder, the number of which is equal to the number of chambers.

The rotation of the cylinder brings each chamber after its discharge in line with the rod, *f*, when this rod is drawn into the chamber by means of the finger pressing against the projection, *g*, thus expelling the empty cartridge case. A succession of shots may thus be fired as fast as the gun can be cocked and the trigger pulled until the magazine is emptied.

A patent for this invention was obtained through the Scientific American Patent Agency on the 14th of January, 1862. The guns have already been manufactured to a sufficient extent to prove the entire success of the invention, and they have been highly commended by the authorities before whom experiments have been made. The parties are desirous of disposing of an interest or making such other contract as will enable them to commence their manufacture upon an extensive scale. All necessary information can be obtained by addressing Messrs. Freeman Brady, Jr., and John C. Noble, at Washington, Washington County, Pa.

To Prepare Aniline.

A fine stream of benzole and another of the strongest nitric acid are allowed to run together in a long glass tube, which is kept cool. When the two liquids come in contact they react on each other, heat is disengaged and nitro-benzole is formed. Commercial nitric acid, mixed with half its volume of sulphuric acid, may be substituted for the concentrated nitric acid. The nitro-benzole thus formed by the chemical combination of the benzole with the nitric acid, is washed with water first, then with a solution of carbonate of soda, to remove any free acid, and afterward with water. Nitro-benzole is a yellowish liquid which, when submitted to great cold, crystallizes in needles. Its odor resembles that of the oil of bitter almonds. It is almost insoluble in water, but is very soluble in alcohol. Nitro-benzole is the product from which aniline is made. The combination of it with hydrogen converts it into aniline, but there are various modes by which this may be done. One method of doing this is to place nitro-benzole in a glass vessel with chips of zinc Dilute sulphuric acid is now added; this attacks the zinc and decomposes the water, the oxygen unites with the zinc and the hydrogen is set free. The affinity of hydrogen in its nascent state (moment of liberation) is remarkable. It unites with the nitro-benzole and forms aniline, which is held in solution by the sulphuric acid. An excess of caustic soda is now added and the mixture is distilled, when the aniline passes over with the vapor of water. Aniline, when pure, is a colorless liquid, having an aromatic odor and an acrid, burning taste. It is soluble in alcohol and ether; its specific gravity is 1.028, and it does not freeze at 20° below zero. It dissolves sulphur and phosphorus, and is a powerful base, combining with acids to form salts.

Different other modes of producing aniline from nitro-benzole may be practiced, but none more simple than the above. In the early part of 1850, M. Vergnin, a chemist of Lyons, France, while experimenting with aniline discovered the process for converting it into a deep purple-red called fuchsine. This process consisted in mixing ten parts of aniline with seven of anhydrous chloride of tin, and boiling them together for about fifteen minutes. The mixture passes through various shades, and finally becomes very dark. Boiling water is now added, and the vessel containing it is removed from the fire. Some insoluble matters settle to the bottom and the clear is filtered while still hot. This filtered liquor contains the rich coloring matter, fuchsine, in solution. It is precipitated by adding common salt. As this dissolves in the liquor the coloring matter is deposited. The colorless liquid is poured off, and the precipitate is washed with water and dried. It is put up in its dry state for transportation; but before it is employed for dying it is dissolved in alcohol. It will color wool and silk a deep red-purple without a mordant. Various metallic oxides boiled or mixed in solution with aniline under heat, produce a great variety of colors.

The prices of pig iron in Scotland range at present from 47 to 52 shillings sterling per tun—about twelve dollars. The number of furnaces for making such iron is 123; their product last year was 1,050,000 tuns. Only 34,000 came to the United States against 77,632 tuns in 1860.