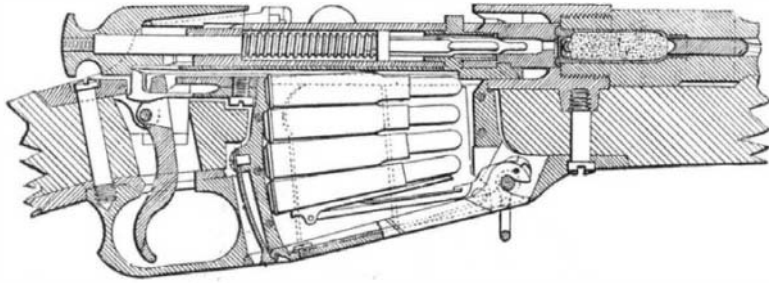


spacious buildings, constructed partly of huge, well-cut stones. The roofs, however, were of thatch. Some of the stones were of such stupendous size and dimensions as would test the best skill of the modern contractor to transport and put in place. This was accomplished by means of wooden rollers, ropes, and crowbars. In most cases no mortar was used, the stability of the building depending on the skill in the close joining of the stone blocks.

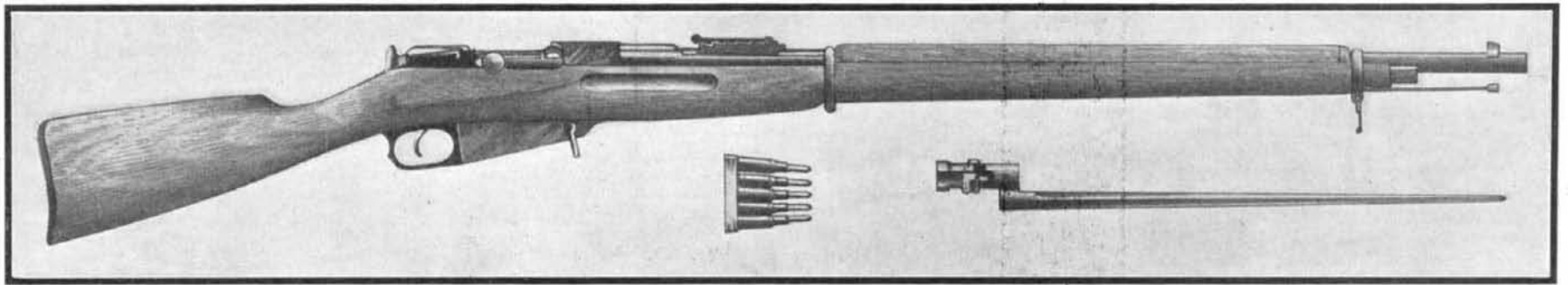
The government of the Incas is said to have been the most enlightened despotism that ever existed, and about the nearest approach to a Utopia which has yet been reached by any people. There was allotted to each man, free of charge, a dwelling site and extended area of land for him to till and cultivate for the maintenance of his family. The surplus of products from this tract, left over from the immediate needs of the owner, was given as tribute to the Inca government, and used for religious, charitable, and other purposes at their sovereign city of Cuzco. Under their wise and just civic administration, crime and public corruption and theft were not known. In

tensive religious code, feasts and offerings of some kind were of almost daily occurrence, and the preparation for and observance of these occupied a great deal of the time of the people. Contrary to statements hitherto made, the sun was not the chief object of worship, but the moon, stars, thunder, lightning, and many natural objects and phenomena were included in the religious code. In Cuzco some forty different shrines existed.

What height Inca culture might have reached had it been allowed to follow a natural course of development



Details of Breech Mechanism.



Length of gun with bayonet, 5.7 feet. Weight, 9.5 pounds. Caliber, 0.27 inch. Initial velocity per second, 2,035 feet. Sighted to 1,600 yards. Weight of cartridge, 390 grains.

THE RUSSIAN ARMY RIFLE.

Cuzco it is stated that a resident with one hundred bars of silver and gold piled up in his house, left it wide open, only placing a small stick across the door as a sign that the master was out—and nobody went in. Agriculture was the chief pursuit followed. Cotton, beans, maize, and coca were raised by the coast people. On the plateau the domestication of the llama and alpaca was the favorite occupation.

The whole tribe was divided into numerous clans. The powers of administration were centered in the elective dignitaries, a military leader, and the head of the religious system. There was also a council of chiefs. None of these offices were hereditary, and could not be occupied by sons unless they were specially chosen for the position. The succession of the chief Inca did not fall upon the shoulders of his child. This was due to the clan organization, which governed the affairs of state. Inheritance was by mother-right. A man could not marry a woman of his own clan, but had to select one from another. This was the main unit for holding the tribe together. Woman had no voice in public affairs, but ruled supreme in the home. She was admitted to esoteric societies, of which there were many. They also practiced healing and became priestesses. Many complicated and elaborate ceremonial and religious rites were observed, and fre-

is one of conjecture and speculation. Judging from their cyclopean architectural remains, and from the splendid examples of their technique, which is so strikingly displayed in the specimens obtained, it seems most likely that they would have kept abreast of the ancient Mexicans.

THE SMALL ARMS OF THE RUSSIAN AND JAPANESE ARMIES.

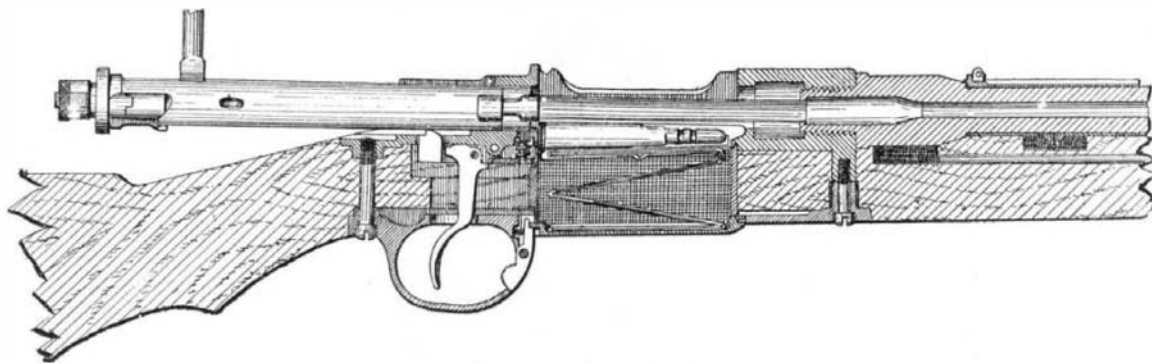
The contest between Russia and Japan will prove fertile in military instruction. Two intelligent, brave, and well organized adversaries have now met in the full shock of battle and tactics and new weapons are going to have something to say. In order to appreciate the results of future operations at their just value, it is necessary to be well informed as to the armament of the forces that are arrayed against each

which is held in place by a spring, serves for indicating distances.

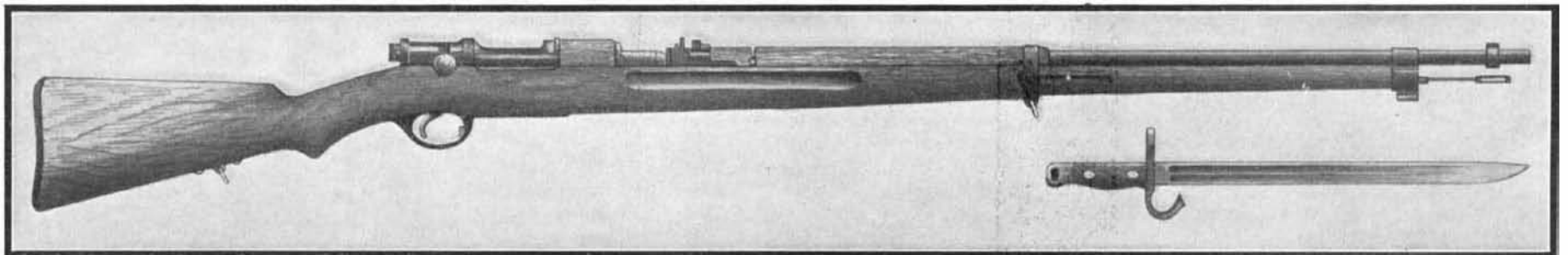
The bayonet comprises a quadrangular blade, which becomes progressively narrower toward the point, and the usual socket and catch, and remains fixed at the end of the barrel, even during firing. The cartridge comprises the shell, primer, powder-charge, and ball. It has no wad. The shell is of brass and provided with a flange. The primer contains fulminating powder covered with a disk of tin. The charge consists of thirty grains of smokeless powder of a basis of gun-cotton. The ball, which is of hardened lead, with a German-silver jacket, weighs 310 grains and is 4 calibers (1.2 inch) in length. The total weight of the cartridge is 390 grains, that of the loader, when empty, 147 grains, and that of the same when loaded, 4.25 ounces. The elevation of 00 paces corresponds to the line of fixed aim constituted by the sight-plate folded.

It gives a sweeping trajectory up to a distance of 600 paces. It is employed when there is no time to spare to give the exact elevation, up to 600 paces, against infantry and 800 against cavalry. In such a case the marksman aims at the upper half of the object.

Firing by volleys is employed at all distances, and individual firing up to 600 and even 1,200 paces, if it is concentrated by groups of marksmen upon the same



Details of Breech Mechanism.



Length of gun with bayonet, 5.4 feet. Weight, 9.6 pounds. Caliber, 0.25 inch. Initial velocity, 2,378 feet. Sighted to 2,000 yards. Weight of cartridge, 336 grains.

THE JAPANESE ARMY RIFLE.

quent sacrifices offered up to their deities. The Incas, under their enlightened system of government, had, however, incorporated in their religious worship some uncanny customs. Human sacrifice was practiced, and on certain occasions a number of young maidens captured from other tribes were offered up to some of their principal deities. These young women were for a long time kept prisoners, and during the interval were employed at making pottery and weaving gorgeous fabrics out of the silk-like threads of vicuna wool for the sacrificial celebration. Owing to their ex-

other, and to give such information is the object of this article.

RUSSIA.

Armament of the Russian Infantry.—The gun is that of Col. Mossine, of the Russian artillery, and bears the name of "3-line (.275-inch) gun of the 1891 type." It is a repeating arm with a central magazine for five cartridges.

The barrel is 30 inches in length and has four grooves directed from left to right. The breech box, which is screwed to the rear of the barrel, is provided

point. Rapid firing is done at the command of "Rapid fire!"

Complementary Data.—Initial velocity, 2,035 feet; maximum pressure per hundredth, 4,400 pounds; pitch of the trajectory at 1,970 feet, 72 feet; length of the gun without bayonet, 4.25 feet; length of the gun with bayonet, 5.7 feet; weight of the gun without bayonet, 8.8 pounds; weight of the gun with bayonet, 9.5 pounds. The number of cartridges carried by the Russian foot soldiers is 120, partly in two cartridge boxes secured to the belt, and partly in the knapsack.

JAPAN.

Armament of the Japanese Infantry.—Japan made war upon China in 1894 and 1895 with the guns of Engineer Mourata of the 1880 and 1887 types, having a caliber respectively of 0.4 and 0.3 of an inch. These guns at present arm only the troops of the second line. The new gun is due especially to Col. Arisaka. It is of the type of 1897, and is manufactured at the Tokio works. Like the Russian gun, it is a repeating one and of small caliber (0.25 of an inch), and with a central magazine for five cartridges. It belongs to the Mauser type.

The barrel, which is 31 inches in length, is provided with six grooves turning from left to right. The breech-sight is mounted upon it by means of a long sleeve, the upper part of which, flattened and hollowed, forms its foot; and the prismatic muzzle-sight is secured to a small hoop that surrounds the tapering end of the barrel.

The movable breech is of the bolt system, and turns back upon the side. The magazine, closed at its lower part by a cover, contains an elevating plate actuated by a spring. If the magazine is empty, this plate places itself in front of the movable head after the opening of the breech, and consequently prevents the closing of it. The object of this arrangement is to notify the soldier that the magazine contains no more cartridges. The recharging is done by means of a brass charging plate provided with five cartridges.

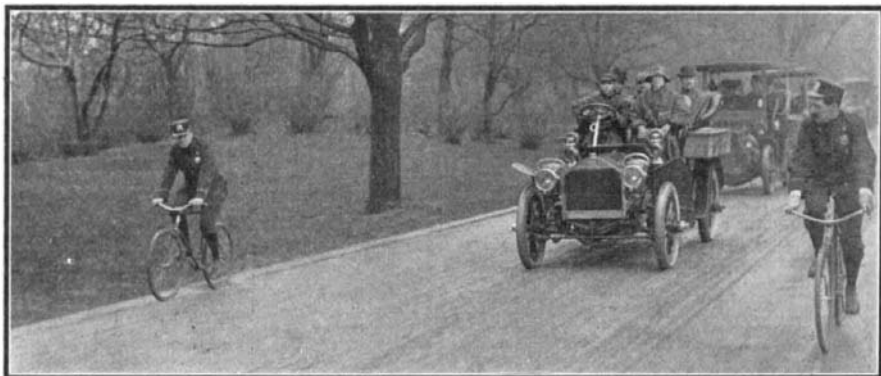
The mounting calls for no particular notice. The stock is formed of two pieces.

The breech-sight has no steps. Its plate is graduated from 400 to 2,000 yards. Up to 400 yards, the soldier makes use of a notch formed in the heel of the plate near the joint. Beyond this he employs the notch of the slider and the two notches of the plate. The slider is fixed at the proper division by means of a small click of which the tooth is held in the corresponding notch formed upon the side of the plate, by means of a spiral spring. The saber-bayonet has a 21-inch blade with a simple bevel and hollowed sides.

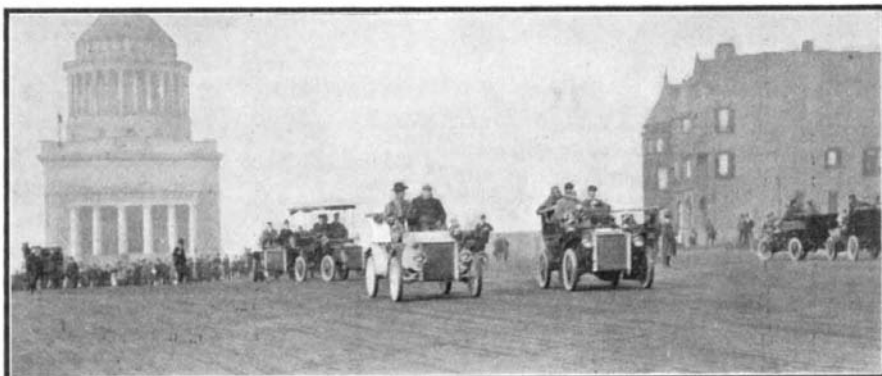
The cartridge comprises a shell, a primer, a charge, and a ball. The shell is of brass with a very convex cap; the primer contains fulminate covered with tin-

foil; the charge consists of 32 grains of Itabaski smokeless powder distributed in scales and strongly plum-bagoed; the ball, which is of hardened lead, with a German-silver jacket, weighs 158 grains and is 1.25 inches in length. The total weight of the cartridge is 336 grains; that of the charging plate, empty, 128 grains, and full, about 4 ounces. The charging plates are united in threes in cuneiform cardboard boxes weighing 12 ounces each.

Complementary Data.—Initial velocity, 2,378 feet; pitch of the trajectory at 500 yards, 3.87 feet; length of the gun without bayonet, 4.16 feet; length of the gun with bayonet, 5.44 feet; weight of the gun without bayonet, 8.6 pounds; weight of the gun with bayo-



THE DIVISION OF FOREIGN CARS AND RACERS IN CENTRAL PARK.



DIVISION OF WHITE STEAM CARRIAGES MAKING THE TURN AT GRANT'S TOMB.

net, 9.6 pounds; penetration of spruce at 130 feet, 7.5 feet.

The number of cartridges carried by the Japanese foot soldier is 120 (as in Russia), partly in two cartridge boxes and partly in boxes in the knapsack.

NEW YORK'S SPRING AUTOMOBILE PARADE.

What was undoubtedly the longest procession of automobiles that has as yet been seen in this city was that which went through Central Park and up Riverside Drive to Grant's Tomb and back on Saturday, April 30. Though the parade was obliged to start in a pouring rain, 142 pleasure vehicles entered Central Park at about 2:30 P. M., and passed through and out at Seventy-second Street at a speed of seven miles an hour. One of our illustrations shows one division of the parade, headed by bicycle policemen, on its way through Central Park. The first car in this division was a gasoline Locomobile.

On emerging from the park at Seventy-second Street, the parade was enlarged by 73 commercial vehicles and trucks, so that altogether there were 215 automobiles in line. Our second photograph was taken at the turning point near Grant's Tomb. It shows the White steam carriages, which were the only steam machines in line, and which, as usual, made a fine showing.

The machines went so slowly through the park, in order to keep within the seven-mile speed limit, that some of the larger ones had trouble with the water boiling in their radiators, and were consequently obliged to drop out of the procession.

About thirty machines had canopy tops, but the majority of the automobilists had to brave the rain. One of the large covered Panhard machines was driven by a lady, who had with her three lady friends. Altogether, about twenty women rode in the parading cars.

If the weather had been fair, it is probable there would have been four or five hundred automobiles in line. Considering the weather conditions, a very good showing was made.

The first asphalt pavement was laid in Paris in 1838, and since then the demand for this purpose has warranted an annual production throughout the world of 450,000 to 500,000

metric tons of asphaltum and bituminous rock. The consumption in the United States alone in the year 1903 was over 250,000 tons, which is equivalent to more than one-half of the average production in the world.

RECENTLY PATENTED INVENTIONS.

Hardware.

PIPE OR BAR CUTTER.—W. T. SNELL, Octave, Ariz. An object of Mr. Snell's invention is to provide a cutting-tool which may be adjusted to fit and securely clamp any size bar or pipe while the cutting operation is being proceeded with, the arrangement of the parts being such that the size and depth of the cut made by the tool may be regulated, depending entirely on the force or pressure exerted through the handle by the operator.

Heating and Lighting.

GAS-HOLDER.—J. H. COKE, Black Diamond, Wash. The leading feature of this invention resides in means for containing any quantity of gas under high pressure and for automatically reducing and regulating this pressure as the gas is fed to the point of consumption. This enables the gas, particularly in case of acetylene, to be used at a point removed from the point of generation, and by enlarging the capacity of the principal or high-pressure reservoir the periods between the recharging of the gas-holder may be extended to any reasonable length.

ACETYLENE-GAS GENERATOR.—G. A. BROWELL, Pittsfield, Mass. In this patent the invention pertains to improvements in acetylene-gas generators, an object being to provide a generator of simple construction and having means for automatically feeding the carbide in determined charges or quantities, thus making the generation of gas practically continuous and under even pressure.

Machines and Mechanical Devices.

LIQUID-DISPENSING APPARATUS.—W. B. COCHRANE, Chicago, Ill. This apparatus is constructed to allow bottles or packages to be contained therein at one time although the liquid contents of the packages may be individually drawn off by the manipulation of suitable valves. Each bottle or package is held airtight in engagement with a stopper, and the package is supported by a form of holder which can be manipulated so as to readily dismount an empty bottle and replace it by a filled bottle.

ILLUMINATOR FOR SEWING-MACHINES.—P. ENGLUND, Chico, Cal. In this case the invention refers to an illuminating device for

lighting sewing-machines and analogous structures. Mr. Englund's particular idea is to produce a simple, efficient, and reliable illuminator for use upon sewing-machines and to a great extent controllable at will by the operator so as to attain the best distribution or concentration of light upon any desired object on any part of the table.

CONTROLLING DEVICE FOR MAINTAINING STEADY PRESSURE.—T. P. FORD, New York, N. Y. This device is of that class that are used for operating dampers of boilers or for starting and stopping pumps employed for pumping water into overhead tanks and the like. The device is exceedingly sensitive and is arranged to work quickly to change the position of the stopping and starting mechanism of the pumps, damper, or other device to be controlled.

MEASURING APPARATUS.—C. R. HUDSON, Warren, Ind. The invention comprises a peculiarly-arranged instrument adapted to be used in connection with a line descending into the well and to indicate the depth to which such line descends. Preferably the instrument is used in connection with the sand-line which is attached to the bailer of the well-driving apparatus; but the invention is not limited to such connection.

PLANNER.—E. RAWSON, Moscow, Idaho. In this instance the improvement relates to wood-working machinery; and the object is to provide a planer arranged to permit a slow or fast feed of the material to be treated in either a forward or backward direction and to allow convenient adjustment of the feed-rolls and the cutter-head to treat materials of different thicknesses without stopping the machine.

MACHINE FOR SEWING CORSETS.—S. ROYLE, 56 St. Andrews road, Southsea, Hants, England. Mr. Royle's object is to provide means whereby the piece of fabric to be united will be simultaneously fed by the folding inward to a definite extent and in opposite directions of their cut edges and at the same time overlapped to the exact extent required and united by the double line of stitching in such manner that the configuration of the corset when the parts are united will be determined by the contour of the cut edges of the component parts.

MUSIC-LEAF TURNER.—C. THOMA, JR., Carlstadt, N. J. One purpose of this invention is to provide a construction of turner and one which will not injure the page or sheet of

music in connection with which it is used, and, further, to provide a conveniently-accessible means for turning one leaf after the other, each leaf being independently turned by a single movement of the hand, which movement will necessitate the removal of the hand from the keyboard for only a fractional portion of a second of time.

CEMENT-PLASTER KETTLE.—C. H. MALONE, Acme, Texas. The present invention is an improvement in kettles for cooking gypsum in order to convert the same into cement-plaster. Means are provided that are highly advantageous in many directions such, for instance, as, preventing the kettle from burning; carrying off steam and dust that may accumulate in cooking the raw material; and securing the benefit of the heat to cook the plaster with less fuel than in the ordinary kettle now employed.

Of Interest to Farmers.

FENCE-POST.—M. C. WIX, Milburn, Ky. In this patent the improvement refers to fence-posts, and it consists of a special post, having peculiar wire fastenings, whereby the fence-wire strands are effectively secured to the posts. The strand is passed into a pocket of a slot and when a hook device is adjusted to the limit of an elongated slot on its securing-pin a bill of the hook device will pass over the strand-wire and drop to engagement therewith.

GRAIN-SCREEN.—F. FREDEN, Taylors Falls, Minn. In this case the improvement is in that class of grain screens or sieves which are provided with transverse slats pivoted in such a manner as to adapt them to be adjusted at different angles. Mr. Freden has devised certain novel features whereby the screen or sieve is free from some objections to others of its class, and is superior in other points.

COMBINED GRAIN THRESHER AND SEPARATOR.—F. FREDEN, Taylors Falls, Minn. This machine is an improvement in that class of threshers and separators in which a series of horizontal tooth-bars are connected with transverse crank-shafts in such manner that they receive the combined up-and-down and forward-and-back movement, whereby the mingled straw and grain received from the threshing-cylinders are conveyed rearward and the grain separated from the straw in the course of its progress.

WIRE FENCE.—W. B. HUGHES, Dallas, Texas. The present invention is an improvement in wire fences, and particularly in that class of such fences which employ line-wires composed of strands twisted together to form a twisted cable, and the invention relates particularly to the connection between the fence-stays and the cables.

Prime Movers.

COMPOUND ENGINE.—S. ROTHSCHILD, New York, N. Y. The object of the invention is to provide an engine which is very compact, easily started and reversed, and arranged to utilize the motive agent to the fullest advantage. The special arrangement is such that the low-pressure cylinder not only contains the low-pressure piston, but also the high-pressure cylinder.

Pertaining to Vehicles.

DUMPING-CART.—S. GANTZ, Hagerstown, Md. The present invention is an improvement upon the dumping-cart for which Mr. Gantz received former Letters Patent. The invention provides a means for shifting the relative positions of the axle and body whereby in dumping the axle is drawn forward of its normal position to facilitate the tilting of the body.

Of General Interest.

NON-REFILLABLE BOTTLE.—A. OULLIÉ, 83 Rue Blanche, Paris, France. In this patent the improvement has reference to non-refillable bottles; and it consists of a system of plugs or obturators for preventing bottles carrying good marks or labels from being fraudulently filled with a view to deceive the consumer as to the origin of the liquid contained in the bottle.

COMBINATION COLLAR AND CUFF BUTTON.—A. E. STRANG, Canton, Ohio. The inventor provides a button of a construction by which the parts thereof may be readily reversed and applied or fitted together to adapt the button for either of the uses for which the same is primarily intended, and a button which is light in weight, besides being strong and having a capacity for long and continued service. The structure of the button may be readily altered or changed to either form without loss of time and with comparatively no labor.