

THE GERMAN ARMY MAGAZINE GUN.

The new magazine gun with which the German army will shortly be entirely provided is known as the M. 71-84 gun. It is the Mauser gun of the model of 1871, with the addition of a repeating mechanism which was definitely adopted in 1884, as the result of studies carried on simultaneously at the German military school and at the firearm manufactory at Spandau. The system for closing the breech is that of Mauser of 1871. The breech is seen to open at the side, like the Gras gun, and the pin hammer, formed of a metallic spindle, is pushed forward by a spring. Two important improvements have been made. The trigger is continuous in its action, which favors the conditions for accurate aiming, and the extractor automatically throws out the empty shell after discharge, while formerly it was necessary to withdraw it from the breech by hand.

The method of operation of the repeating mechanism is clearly shown in the accompanying illustrations. The magazine chamber is bored in the wood under the barrel. The cartridges are inserted therein, end to end, behind a spiral spring, which pushes them toward the rear, into a receiver or socket, which is pivoted on the axis, G, and which is represented in one of the pictures as dropped to receive the cartridge coming from the magazine, while in the other figure it is shown as raised, to bring the cartridge to the opening of the barrel, into which it will pass by the forward movement of the movable breech, which

Dangerous Paints and Compositions.

There is much in a name when it enables manufacturers to send by rail and by sea a dangerous compound identified by some title which appears to belong to a harmless composition. Judging, however, by the evidence taken during the official inquiry into a serious explosion on board the Thorndale, of Sunderland, by which one man was killed and two seriously injured, on September 23, 1886, while on a voyage from Sunderland to the port of Galveston, this is a common practice. Mr. Danckwertz, in stating the case for the inquiry, said that before leaving, the Thorndale took on board three casks of "anti-corrosive paint," each containing about twelve gallons, and stowed under the fore-castle. The casks bore no notice of any kind as to any special caution being necessary in dealing with the paint. When clear of the Channel, the day watch was set to work to paint the interior of the vessel. While the men were engaged in pouring out the paint by the light of a candle, about four feet from the casks, a serious explosion occurred, which knocked down the men standing round. The boatswain, who held the candle, had his clothes set on fire and was much burned, and two others similarly had their clothes set on fire, one being so much injured that he died the next day.

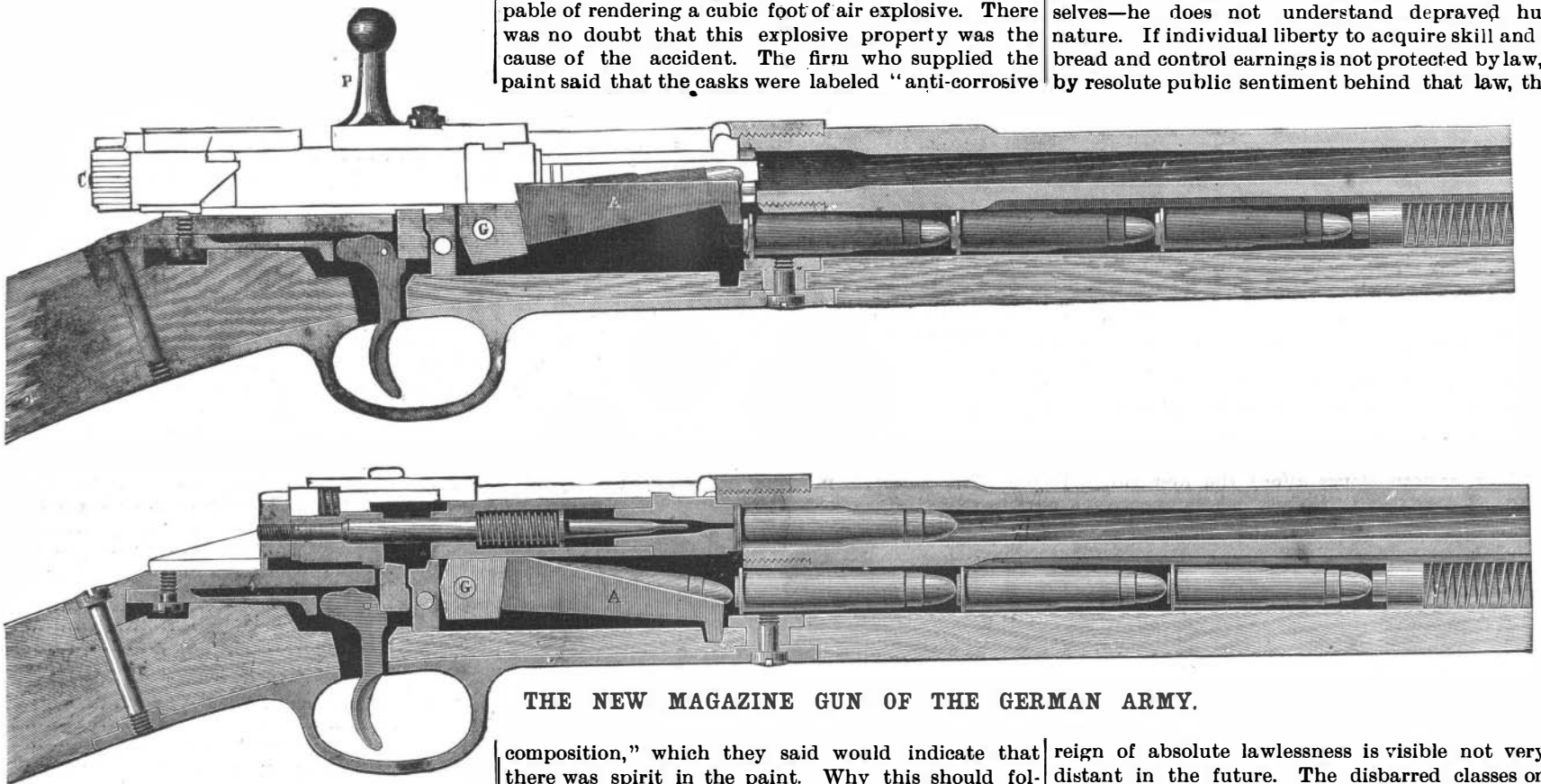
This anti-corrosive paint contained among other things "coal tar naphtha," and Dr. Dupre proved that by analysis the volatile hydrocarbons constituted some 2 per cent of the mixture. The result of the analysis seemed to be that one cubic inch of the paint was capable of rendering a cubic foot of air explosive. There was no doubt that this explosive property was the cause of the accident. The firm who supplied the paint said that the casks were labeled "anti-corrosive

appears that neither railway companies nor ship owners have knowledge of the possibly dangerous nature of these paints or compositions. If they had, they would certainly carry them under special conditions and by special means, and ship owners would be careful of the way in which they stored materials which might give off a gas which, if fired in some parts of the ship, might send her to the bottom in the most innocent and unexplainable way.—*The Engineer*.

Something Else Coming.

According to the *Interior*, another moral question is coming into politics, which will undoubtedly raise a pretty stiff breeze of moral indignation. Says the *Interior*:

"A father might to-day tramp all over Chicago with a son who wanted to learn an honest trade, so as to become a useful citizen, and fail, unless he took him to the Manual Training School and paid tuition for him. Hundreds of boys are now thus taught handicraft at the expense of fathers who can afford to pay for it. But let a poor man's son try it, and he will be met at the door of the factory or shop by a walking delegate of the Knights of Labor, and turned away. If that does not do, his young face will be bruised by brutal fists, and so will the faces of those who stand by him. If any one supposes that there is any limit to this kind of opposition—any point at which the would-be monopolists of labor would draw the line of limitation upon themselves—he does not understand depraved human nature. If individual liberty to acquire skill and earn bread and control earnings is not protected by law, and by resolute public sentiment behind that law, then a



THE NEW MAGAZINE GUN OF THE GERMAN ARMY.

drops the socket at the same instant to receive a new cartridge.

The action of the socket is regulated by a spring which tends to tip it up, but its action may be stopped by means of a little lever which extends through to the outside, at the left side of the arm. When the lever is inclined toward the butt, the repeating mechanism operates as described above, but if it is left vertical, the socket is thrown out of action, and the gun must be loaded by hand, with a single cartridge at a time.

The new arm is ordinarily to be used under the last named conditions, as the Germans do not consider rapid fire necessary except under special circumstances, as in the service of advance posts, or when it is necessary to repel an attack of cavalry at close range. To this end, the magazine should always be filled at the beginning of an action, but should not be used until the critical moment arrives. The magazine contains eight cartridges. With one in the socket and one in the breech, the new gun can be discharged ten times, without being newly charged, in 20 or 30 seconds.

The number of reserve charges is, therefore, less than the Colt gun (15 shots), or than the Suisse Vetterli (13 shots), but the number is thus reduced to obviate the inconvenience which arises from the inaccuracy of fire if the center of gravity is thrown too far forward by a long magazine.

The Mauser gun, 71-84, with its bayonet, is 70 inches in length, and weighs when empty about 12½ pounds. The official notice from which this information is derived fixes its range at about 650 feet on a single foot soldier, at a quarter of a mile on an object the size of a section of infantry, and at three-eighths of a mile for a still larger body of troops.—*L'Illustration*.

HOLD your breath and contract your abdominal muscles is the remedy for sea-sickness suggested by an English physician, Dr. E. P. Thurstan, who speaks from experience.

composition," which they said would indicate that there was spirit in the paint. Why this should follow is not clear. Dr. Dupre stated that at a temperature as low as 60° Fah. to 65° Fah., one cubic inch of it was sufficient to render one cubic foot of air explosive, and that under a higher temperature it would give off a much larger quantity; that under the circumstances under which this paint was being poured from one cask to another, the production of gas from it would be much increased; and that the quantity of paint poured out on the occasion in question was probably sufficient to render from 2,000 cubic feet to 3,000 cubic feet of air explosive. "Unless," said the Wreck Commissioner, "there was an order issued by the Privy Council that a notice should be placed on all similar compositions, it was doubtful if makers would do it, though with such dangerous compounds they would incur grave responsibility."

Numerous accidents and serious have occurred from similar causes, and the important issues at stake render legislative action urgently requisite, as, whether stored in railway sheds or trucks, in docks, in the storerooms or holds of ships, so low an explosive temperature as 60° renders this kind of material more dangerous than gunpowder or dynamite, and it is surely time that it should be placed under proper restrictions in its manufacture, storage, and carriage, so as to minimize as far as possible the great risks due to this new element of destruction to life and property alike. If makers were responsible for the results of these occurrences, they would probably soon find a material for making these quick-drying compositions without volatile spirits. It is lamentable that men should be blown up and killed or seriously maimed and no responsibility be incurred by the person supplying or making the compound, without clearly stating its nature and explosive character. It appears that there are many makers of these paints and compositions for the insides and outsides of ships, and that all, or nearly all, contain a notable percentage of these very highly volatile hydrocarbons. It further

reign of absolute lawlessness is visible not very far distant in the future. The disbarred classes on one hand and the employing classes on the other will join hands, and fight for their rights. The violence will not very long be all upon one side, and the violence which has human liberty and rights back of it will win. We are always glad to see a tyrannical and heartless employer forced to do right by "organized labor," but when organized labor determines to rob the American boy of his birthright, then it is evoking moral and material forces against itself which will not fail to beat it to pieces.

Endurance of Railroad Ties.

The supply of railroad ties is a matter of growing importance for the New England farmer, and certain experiments made at the suggestion of Professor Sargent by the Boston and Providence Railroad have an important bearing on it. Fifty-two ties were laid in December, 1878, on a track in Boston where the traffic is very heavy, having an average of sixty-five trains daily. Ten kinds of wood were tried, five in the natural state and five creosoted. None of the ties rotted, except one of the ailantus; the others that had to be removed had been injured by the hammering of the trains. Spruce, hemlock, larch, and Southern pine have all suffered badly in this way. White oak lasted well, but it holds the spikes so firmly that they cannot be drawn when the rails have to be shifted. Creosoted elm and birch did well, and are to be recommended. Chestnut was, unfortunately, not included in the experiment, although it is considered one of the best woods for ties. The behavior of the catalpa was one of the most interesting features of the case; it has been highly spoken of for ties on account of its practical indestructibility when placed in the soil, and all the ties of this wood here tried are still sound, except just under the rails, where they are crushed nearly to pulp, so as to be of no service whatever for roads of heavy traffic.—*Science*.

Furnace Heating.

Mr. F. Siemens has for the past few weeks been conducting, in the pages of *Engineering*, a correspondence with Mr. Crowe, Mr. B. H. Thwaite, and others, upon dissociation in furnaces and the advantages of heating by radiation from flame, or toasting, as compared with heating by direct flame contact, or burning. The point which seems to be at issue in this controversy is the temperature at which dissociation of carbon gases begins to make itself evident by affecting practical results. Mr. Siemens holds that if flames are prevented from contact with the surfaces which inclose or direct their course, dissociation will not appear below an extraordinarily high temperature, which has not been accurately determined; and that all experiments tending to show an effect similar to what may be expected from genuine dissociation at comparatively low temperatures are vitiated by the action of the surfaces—an effect which has only been recognized during recent years.

With regard to heating by radiation, Mr. Siemens declares that in all cases where large furnace chambers are required to be intensely heated, a highly luminous flame, without contact, is necessary. Under such conditions of heating, the furnace will work economically at a high temperature, and will last a long time without repairs. Mr. Siemens cites an instance of open-hearth steel furnaces which have not been stopped for repairs for upward of twelve months.

In another communication, Mr. Siemens admits that it is difficult for persons accustomed to heat by contact to realize that their operations can be carried out quite as well, and even better, by radiation. He states that the development of this new method of heating was the result of much time and consideration given to the subject; and he does not expect that others will readily accept his views. It is an interesting development of this principle of heating that by it creosote and other kinds of liquid fuel, as well as gas, can be used for purposes for which, according to the ordinary plan, they are altogether unsuited. Only by preserving the flames of these fuels from contact with any surface until the operation of combustion is accomplished can they be made to give all their useful effect without smoking or cutting the materials of the furnace.—*Journal of Gas Lighting*.

SUBURBAN HOUSE OF A NEW YORK ARTIST.

Many New Yorkers have built for themselves beautiful summer residences on the Orange Hills of New Jersey, whose eastern slopes afford the first rise in ground met with on leaving the city in a southwesterly direction. The city is still within the horizon of view, the Bartholdi beacon at night, and the main physical features by day, being plainly discernible, but the distance is sufficiently great from the din and moil of the metropolis to give one a sense of rest, while renewing the tone and elasticity of the system as only the pure air of the country can effectually do.

Among those who have built for themselves homes

speciation of the ground plan shows that this beauty of outward appearance is attained without any sacrifice of economy and convenience in the internal arrangement, such happy disposition being made of the space that all of the room is available, and the best views are obtained from every side. The principal entrance is by the porch, whose roof makes one continued curve with the gable which crowns the projection containing the stairs, with which it communicates, and from the vestibule is an entrance to a large square hall, shown in one of the views, which gives immediate entrance to parlor and dining-room, piazza and staircase, and forms the central portion of the ground plan. The roof above the hall rises higher than that of any other portion of the building, and the turret-like cap of the two-storied piazza is an adjunct of it, the attic under the roof being used by the artist as a studio.

Exteriorly, the woodwork of the cottage is painted a dark brown, but this, and the gray plaster of the basement, will eventually be much changed in appearance by the growth of vines and plants, the green of which will make an agreeable contrast with the brown and gray of the building. For the interior, the wainscoting of the hall, its ceiling, and the woodwork of the stairs, are of Georgia pine, varnished to a golden hue. The wall above the wainscoting is a cream tint, with paneling of yellowish matting, but in the dining-room the wall above the wainscoting is painted a light salmon color. The parlor is in warm grays, and the upper rooms are all in light golden yellow tones, each having particular individual effects, but all harmonizing with one general idea, after the plan of the architect, Mr. Ficken, to which Mr. Fenn has contributed by his arrangements of bric-a-brac, draperies of doors and windows, etc.

The entablature bearing the date of building, with its conventional hour glass and wings, is but one of many evidences everywhere seen about the house, in

two of crushed limestone of a hard nature, and one of crushed grit, the whole intimately mixed and ground. Ocher in suitable proportions is added as a coloring matter.

The Liquid.—A saturated solution of zinc in commercial hydrochloric acid, to which is added a part, by weight, of hydrochlorate of ammonia equal to one-



MR. HARRY FENN'S COTTAGE, MONTCLAIR, N. J.

sixth that of dissolved zinc. This liquid is diluted with two-thirds of its bulk of water.

To use the cement, one pound of the powder is to be mixed with two and one-half pints of the liquid.

The cement hardens very quickly and is very strong.

How to Make Money.

Mr. L. P. Tibbals, of 820 Broadway, is pretty generally known by a great many children in this city. He has sold toys and taught Sunday-school a good many years, and he is still a vigorous young man, full of good works. Mr. Tibbals has formulated a very ingenious rule, showing the profit a family may derive from a single whisky-drinking member, as follows:

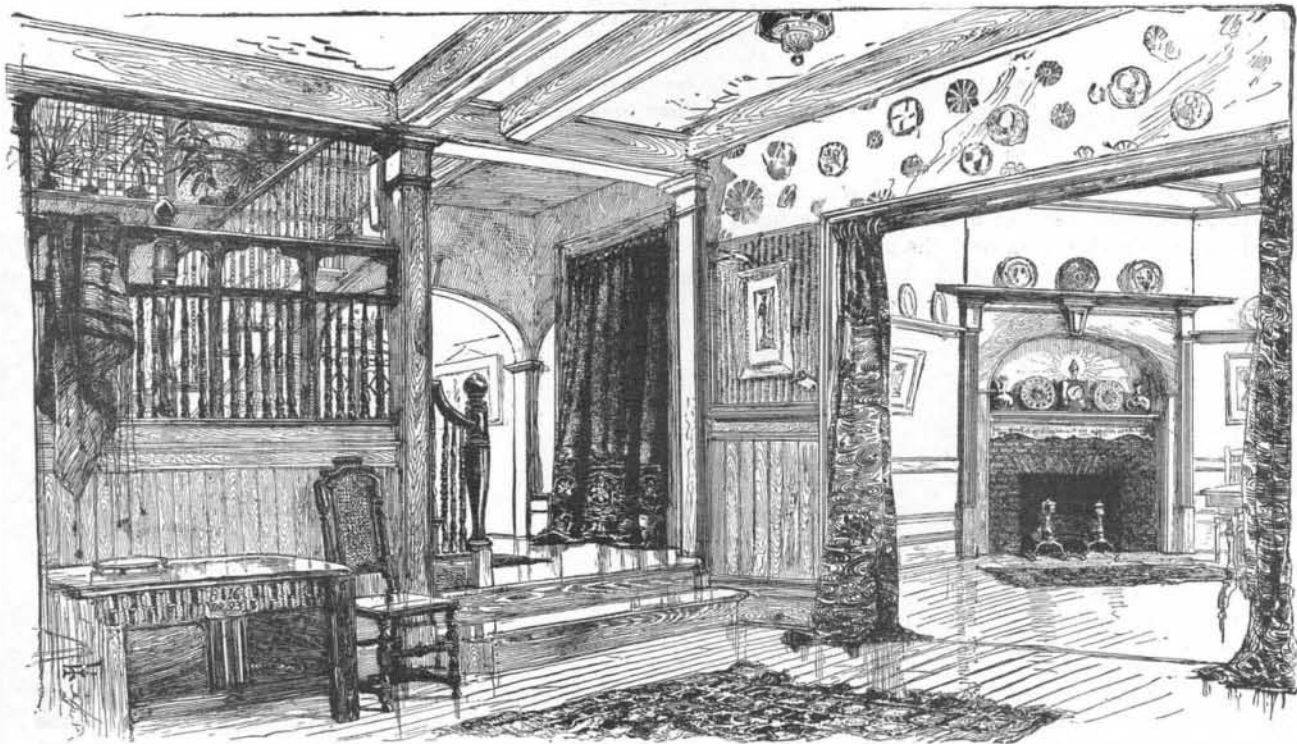
One gallon of whisky costs about \$3, and contains on the average 65 ten cent drinks. Now, if you must drink whisky, buy a gallon and make your wife the barkeeper; then, when you are dry, give her ten cents for a drink. When the whisky is gone, she will have, after paying for it, \$3.50 left, and every gallon thereafter will yield the same profit. This money she should put away in the savings bank, so that when you have become an inebriate, unable to support yourself, and shunned and despised by every respectable person, your wife may have money enough to keep you until your time comes to fill a drunkard's grave.

A Strong Man.

There is a man on the Darson River, below Dayton, named Angela Cordella, who claims to be the strongest man in the world. He is an Italian, aged twenty-eight, and stands 5 feet 10 inches, weighing 198 pounds. His strength was born with him, for he had no athletic training. He differs from other men chiefly in the osseous structure. Although not of unusual size, his spinal column is much beyond the ordinary width, and his bones and joints are made on a similarly large and generous scale. He has lifted a man of 200 pounds with the middle finger of his right hand. The man stood with one foot on the floor, his arms outstretched, his hands grasped by two persons to balance his body. Cordella then stooped and placed the third finger of his right hand under the man's foot, and, with scarcely any perceptible effort, raised him to the height of four feet and deposited him on a table near at hand. Once two powerful men waylaid Cordella, with intent to thrash him, but he seized one in each hand and hammered them together until life was nearly knocked out of them.—*Va. Footlight*.

Sensitive Reagent for Albumen.

M. Simon.—The most sensitive reagent is that of Mehu, a mixture of 1 part crystalline phenic acid with 1 part acetic acid and 2 parts water.



MR. HARRY FENN'S COTTAGE—HALL, LOOKING INTO DINING ROOM

which add to the naturally tranquil beauty of this locality, which is year by year becoming more desirable as the city grows, is Mr. Harry Fenn, the well-known artist, whose drawings are seen in some of the best work which has appeared in our illustrated magazines, and whose cottage at Montclair is represented in the accompanying illustrations.

The building is of wood, having, as will be seen, two main stories and a roomy attic, and the two views given show a picturesque effect, which well fits into and harmonizes with the immediate surroundings, while an in-

design, decoration, and furnishing, of the cultivated taste of the artist who has here made his home.

Metallic Cement.

The following recipe for a metallic cement for repairing broken stone is given by Prof. Brune of the School of Fine Arts. It was used in the restoration of the colonnade of the Louvre, of the Pont Neuf, and of the Conservatoire des Arts et Metiers. It consists of a powder and a liquid.

The Powder.—Two parts by weight of oxide of zinc,