

THE OSCILLATING DISAPPEARING TURRET.

The necessity of protecting guns of large caliber by armored turrets has been recognized for several years. Almost all fortresses are now provided with different systems of these apparatus, and we shall here merely briefly recall the fact that they consist of a large steel plate cylinder resting upon a masonry base through the intermedium of a roller path like that of a railway turn-table. This cylinder is covered with an iron cap from 8 to 10 inches in thickness, and, through an arrangement that we shall describe, is capable of taking a rotary motion around its axis by means of a very simple mechanism installed at the bottom and actuated by manual power. This motion assures of pointing in direction, and at the same time, if it continues after the firing, it permits of causing the embrasures to disappear from the sight of the enemy, and of thus exposing the weak part of the turret to his shots for a short time only. But the time during which this part remains under the fire of the adversary has appeared, with this system, still too long, and so an endeavor has been made, by different means, to shorten it as much as possible. We shall mention that especially which consists in rendering the whole of the turret movable in a vertical direction, and, by means of a sort of elevator and a counterpoise, causing it to rise at the moment of firing and to descend immediately afterward.

Commandant Mougin, engineer of the Saint Chamond works, has found another solution of the problem, which, by the simplicity of the mechanism, surpasses everything that has been done up to the present, and it is this system of disappearing turret that has just been constructed for one of the forts of Bucharest, and which is represented in its entirety in Fig. 1, on the first page. We shall try to make the operation of it understood.

As in all other turrets, we find here the cylinder covered with its cap and placed upon a turn-table pro-

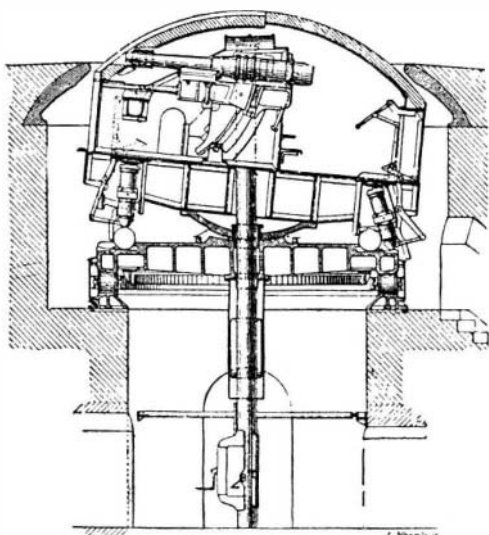


Fig. 2.—THE TURRET AT THE MOMENT OF FIRING.

vided with rollers. Two embrasures allow the muzzles of the guns that arm the turret to appear. But in order to cause these to appear or disappear as quickly as possible, the turret, instead of being placed directly upon the turn-table, rests thereon through the intermedium of a steel piece, B (Figs. 4 and 5), which is a fraction of a cylinder 14.75 feet in length and of 8.5 feet radius. The section at right angles with the axis, represented in Fig. 1, shows the arc of a circle profile of this piece, and it will be at once understood that, resting upon such a base, the turret is capable of taking an oscillatory motion analogous to that of a child's rocking horse. The extremities of this oscillation correspond, one of them, to the position of firing, and the other to the position of loading (Fig. 3).

We shall now see how this huge mass, weighing 528,000 pounds, can be placed and maintained in one or the other of these two positions with the greatest facility. To the right and left of the cylinder (Fig. 5) may be seen two supports, G. These pivot around an axis that permits them to keep a vertical position, whatever be the inclination of the rest of the system. It is these supports that *chock* the turret. They are, in fact, so arranged that when the oscillation is at its maximum, the one that is most elevated places itself, through its own weight, over a roller, H (Fig. 5), and thus prevents the motion from continuing in the opposite direction.

In order to move it from such position, it suffices to press upon a handle that actuates a series of levers, A (Fig. 5). This motion may be effected by one man, because, in all the transmissions of the levers between each other, care has been taken to avoid movements of friction. There are merely rollings upon each other of parts that are perfectly hard and polished. The same is the case, moreover, with the support, G, and roller, H, as may be seen from our engraving. At the least stress, acting otherwise than in the vertical direction, it will be seen that G will slide upon H. This is what takes place, in fact, as soon as the man selected for the maneuver, after bearing upon a safety pedal,

pulls toward him the handle that controls the levers, A. If at this moment the weight of the turret is preponderant on this side, the entire system will proceed to oscillate; but it will accomplish half an oscillation only, because the support placed on the other side

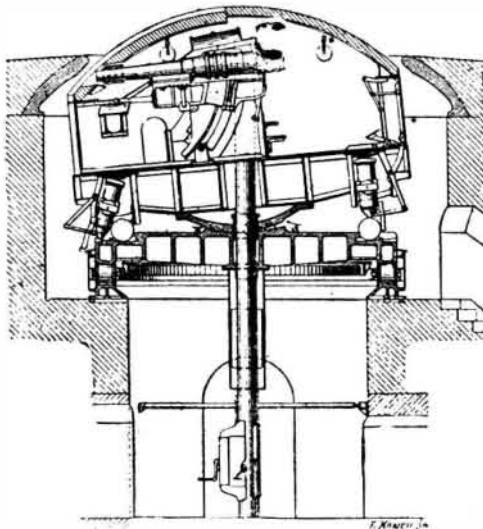


Fig. 3.—LOADING POSITION.

will produce the same effect as the one just mentioned.

Being given these arrangements, it suffices to assure the preponderance of weight of one side or the other of the turret, according to the direction in which it is desired that it shall incline.

Let us say in the first place that there is, invariably, a preponderance upon the part represented to the right in our figures, by means of masses of lead fixed thereto. It suffices, then, that it shall be possible to place or remove a weight heavier than those of the other side in order to produce the motion desired. Such weight, represented at P (Fig. 5), is suspended by a chain from an arm, R, which is independent of the oscillating system and which is connected with the stationary tube, T, that occupies the center of the turret, and in which the charge and the projectiles are lifted. The chain from which the counterpoise, P, is suspended passes over pulleys and ends beneath at a windlass, M, which is maneuvered by two or three men. In the other figures these arrangements are not represented, as they would have hidden important details. Figs. 3 and 5 represent the turret in the position of disappearance. The gun has just been fired and is about to be reloaded. During this time, men placed at the windlass, M (Fig. 5), raise the weight, P, to a certain height. The rest of the system will not budge, since it is chocked to the right by the support, G. But, as soon as all is ready, one of the men will bear upon the lever mechanism that controls this support; the weight, P, being raised, will have no more action, and the part to the right having the preponderance, as we have said, the turret will oscillate on this side, and will take the firing position shown in Fig. 2. The shot will be fired at once. But, upon reaching this position, the floor of the turret will be inclined, and will rejoin the weight, P. A special arrangement (not visible in the figure) having at this moment automatically thrown the windlass, M, out of gear, this weight will rest upon the floor and will assure a preponderance on this side of the turret. As soon as the support that keeps it in the firing position is raised, it will again assume the disappearing position.

We just spoke of the tube that occupies the center of the turret and is situated between the two guns

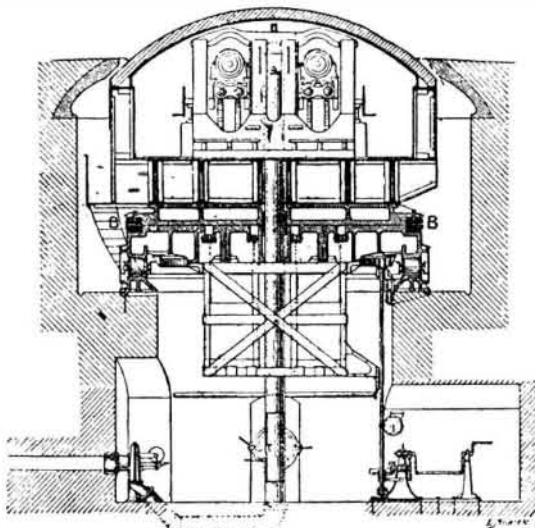


Fig. 4.—SECTION OF THE TURRET TO THE REAR OF THE TWO GUNS.

(Fig. 3) that arm the latter. As we have said, this tube is immovable, and it will be seen from an examination of Figs. 2 and 3 that, in consequence of the motions of oscillation of the turret, it is in the vicinity of the breech of the guns only during the position of disappearance, which is also that of firing. It is through

the intermedium of this tube, and by means of a special windlass, that the ammunition is raised. It is utilized also for ventilating the turret by means of a small turbine that may be seen at the bottom and to the left of Fig. 1.

We shall now, in a few lines, recapitulate the very simple maneuvers of the turret.

The firing is directed by an officer standing in an external observatory connected telegraphically with the turret. Here there is a sub-officer who directs the maneuvers, but who, as regards pointing, merely executes the orders of his superior without seeing the effect produced. For direction, a graduation of the circle is indicated to him, and he causes the turret to be revolved, by means of a windlass placed to the right, until it reaches the desired degree. And so too for pointing in elevation, he lowers or raises the breech to the degree indicated. As for the firing, that is done electrically by pressing a button.

As may be seen, the artillerymen are reduced here to the role of a wheelwork interposed between the commandant and the gun. Completely isolated from the outside, they mechanically execute a firing of which they see neither the object nor the effects.

In becoming scientific, the art of war, like the industry from which it borrowed its processes, has had to specialize individuals and reduce their initiative, and, while admiring the ingenuity of the new inventions, we cannot help averring that they are tending more and more to cause the disappearance of whatever of the picturesque and poetic battle might have. We can no longer think, without shuddering, of the moral state of these few men, inclosed in this carapax of iron, when the enemy's projectiles strike the wall of it, when deafened by the fearful shaking of this huge bell, suffocated by the heat, and obliged to keep their ventilator in continuous operation, lest they be completely smothered. They run the risk at every moment of being buried alive by a breakage of commu-

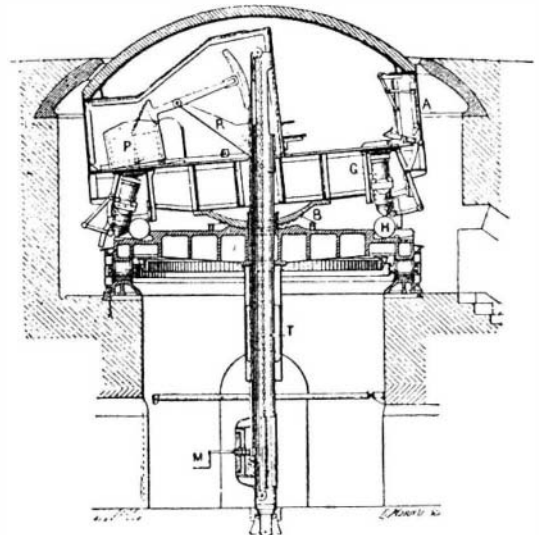


Fig. 5.—TURRET RETURNING TO THE POSITION OF DISAPPEARANCE THROUGH THE AGENCY OF THE COUNTERPOISE.

nications or a stoppage of the mechanism. Doubtless the wars of the future will have their heroes, but heroism will have changed nature, like war itself and its apparatus, and victory will be the triumph of the mechanic.—*L'Illustration*.

Chloride of Zinc for Tuberculosis.

M. Lannelongue's treatment of tubercular diseases, as brought under the notice of the Paris Academy, is essentially based on the simple fact that fibrous induration is to be regarded as the natural curative process of tubercular change; and it having been found that chloride of zinc is peculiarly apt to excite such sclerotic processes when administered in sufficiently small quantity—two or three drops of a 10 per cent solution—so as to obviate its more powerful escharotic action, this substance has been employed, yielding very satisfactory results in external tuberculosis, and its application in the case of pulmonary tubercle is, according to M. Lannelongue, equally encouraging. It would appear from the accounts given of this treatment that the tubercular formation itself is less influenced by the agent—which has no specific property—than are the healthy tissues that surround the tubercles. The aim of the Lannelongue method is, therefore, to induce the formation of a densely fibrous investment to active tubercle, and by this process to limit the diseased product, and as it were to imprison the bacilli.

The New Postal Card.

The Morgan Envelope Company, Springfield, Mass., has the contract for 24,000,000 double postal cards, a new device which has long been considered by the Post Office Department. The card will be five and one-half by three and one-half inches, and will be folded in the middle, presenting four surfaces. The outside surface is for the address and the inside for the message. At the fold the card is perforated, so that the recipient will tear off one half and then answer on the other.

SCIENTIFIC AMERICAN

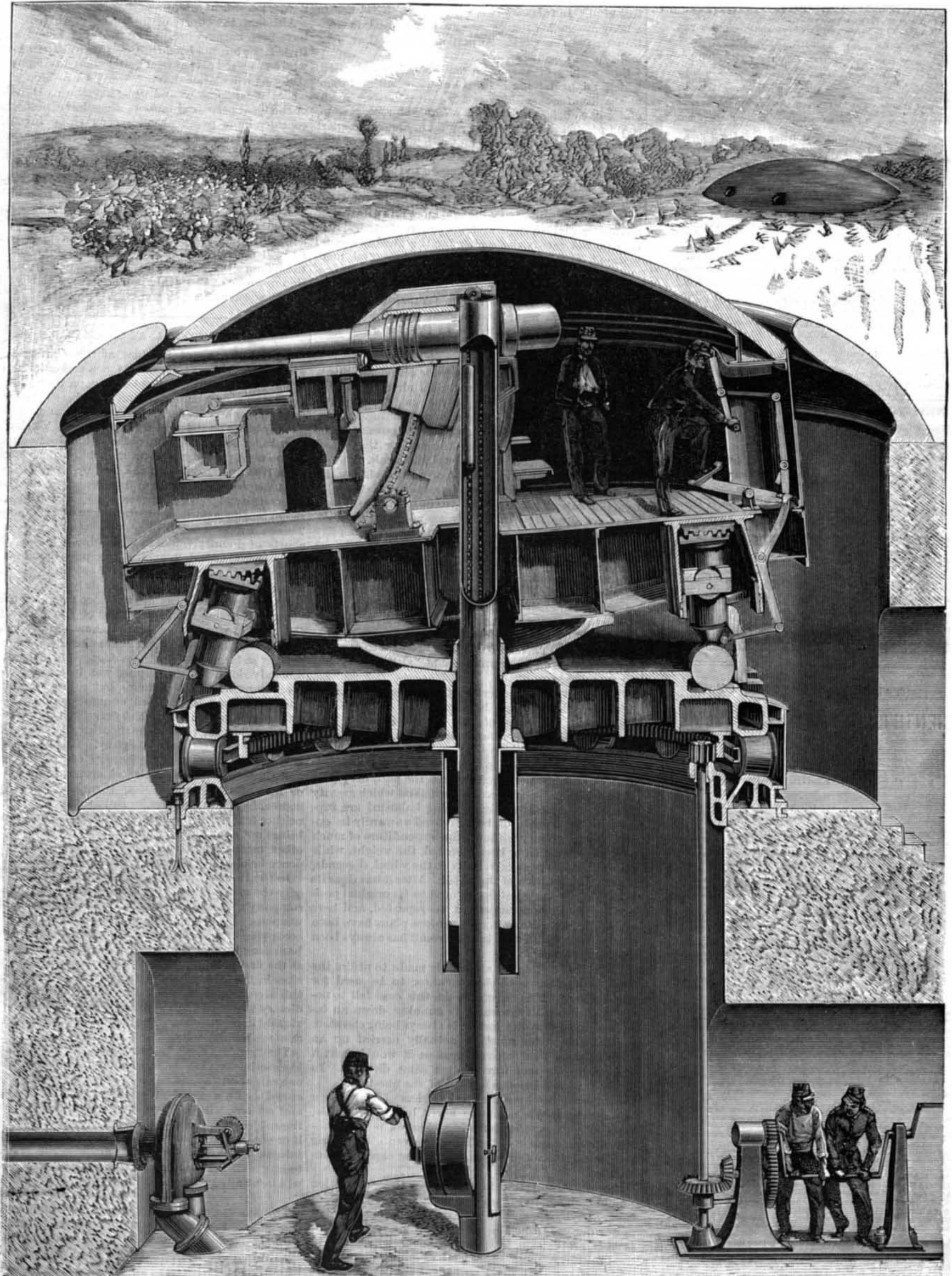
[Entered at the Post Office of New York, N. Y., as Second Class matter. Copyrighted, 1892, by Munn & Co.]

A WEEKLY JOURNAL OF PRACTICAL INFORMATION, ART, SCIENCE, MECHANICS, CHEMISTRY, AND MANUFACTURES.

Vol. LXVII.—No. 5.
ESTABLISHED 1845.

NEW YORK, JULY 30, 1892.

\$3.00 A YEAR.
WEEKLY.



THE DISAPPEARING TURRET FOR COAST-DEFENSE GUNS.—Fig. 1.—[See page 69.]