

NEW SYSTEM OF ELECTRIC SIGNS AND SIGNALS.

Our front page is devoted to the illustration of a new system of signs and signals, whose operation is secured by the ingenious combination of a set of incandescent lamps and typewriter keyboards. This somewhat elaborate plant is a development on a large scale of a recent invention of L. S. Crandall, whose name is well known in connection with his work in the development of the typewriter. The object of the device is to enable electric signals to be spelled out, as it were, upon a large board or frame suitably displayed in some conspicuous position, the letters being successively flashed out in lines of light which are visible at a distance of several miles.

The fundamental feature is a large shallow box or frame, Fig. 3, in which a number of incandescent lamps are arranged in certain lines and curves, which are so related as to enable any letter of the alphabet to be formed by them. The lamps are electrically connected in clearly defined groups, as shown in Fig. 8. There are nineteen groups in all, and each group has its own separate electrical connection with the main line and with the return current. By this arrangement it is possible to excite any one or any combination of the nineteen groups, the rest remaining dead, and thereby cause the desired letter of the alphabet to shine out in the frame.

It will be seen that the pattern is made up of two bisecting crosses, bounded by a vertical line on each side of the frame, and two curved lines, one at the top and one at the bottom. By comparing the wiring diagrams, Figs. 7 and 8, it is easy to understand how the letters are formed. In Fig. 7 the letter M is shown in small white spots representing the lamps that are lit. These lamps, it will be seen, include groups 1, 2, 3, 4, 5, 6, 7, 8, 15, 16, and 17. If the letter T were to be shown, it would be necessary to excite groups 2, 3, 9, 13, 14, and 15. The letter O again would require the combination 5, 6, 7, 8, 9, and 10.

As a counterpart to this "monogram," as it is called, a keyboard is provided by means of which, on pressing any particular button, the current is switched onto the groups of lamps which form the desired letter. With this keyboard in front of him the operator is able to spell the desired word, letter by letter, in brilliant lines of light upon the monogram board, which is displayed in some prominent position.

This is the system which was satisfactorily tested by the government on the night of April 2, in New York Bay. The frame, measuring 3 feet in width by 5 feet in height, was erected on the top of a hotel fronting on the bay, and the government boat withdrew to a distance of a mile. Here it was possible to read the messages with the naked eye. The letters were easily distinguished with glasses at the three and a half mile mark. On this occasion the "ray protectors," to which reference is made below, were not used, and it is therefore considered probable that with these in place the messages will be decipherable at a distance of five or six miles in clear weather.

Instead of using only one frame, and producing the words letter by letter, it is of course possible to combine any number of frames and give the message, advertisement, or what not, in full. This has been done by a well known New York paper in the elaborate plant which we illustrate on our first page. Upon the roof of one of the buildings which front on Madison Square, a double bank of 38 frames has been erected. The frames are all identical with the one shown in Fig. 3, and each frame is connected directly to its own keyboard. The construction of the keyboard is as follows: There are 26 keybars, corresponding to the letters of the alphabet, and the buttons are arranged on the system adopted on the Remington typewriter. Beneath the keybars are nineteen contact bars, corresponding to the 19 groups in the frame, which run transversely across the board. The bars are connected through terminal posts to the nineteen groups of lights in the frame. Each keyboard carries a number of contact pins, Fig. 6; which, when the bar is pressed down, throw into circuit the proper groups to form the desired letter. The arrangement is clearly shown in Figs. 1, 2, 5 and 7. It should be mentioned that, when a single box is in use, all of the 26 keybars are in the main line circuit and that, normally, the bars are kept out of contact with the contact bars by the spring shown at the hinge end of the keybar in Fig. 5. Consequently, the lamps in the frames are dead, except when they are thrown into circuit by the depression of the keys.

In the large installation at Madison Square there are thirty-eight frames arranged in two tiers. Each frame consists of a shallow metal box about 8 inches deep, 3 feet wide and 5 feet high. In order to prevent the flood of light from producing a blurred or confused effect, it has been found necessary to confine each light in a "ray protector," which in this case is simply a tin funnel (Fig. 4). This prevents the lights from blending, as it were, and sharpens the effect as seen from a distance. Another form of "protector" is shown in Fig. 9, in which the light is confined in channels. This form is simple in construction and made of sheet metal. Another method adopted is to cover the frame

with a sheet of black glass, with clear lines left in front of each group of lights.

The illustration, Fig. 10, shows the interior of the switchboard room, which is erected on the roof of the building near the monogram frames. On three sides of the room are arranged the thirty-eight keyboards corresponding to the thirty-eight frames. In making up a sign or an announcement the operator presses the desired button on each keyboard, the key being held down by a magnet which extends across the board as shown in Fig. 1. When all the keyboards have been arranged, the main current is turned on at the switchboard, and the whole thirty-eight boxes are illuminated.

It is considered that the system will prove of considerable value in naval, military and coast defense work. For such operations it has the important features of distinctness and reliability. There is practically no limit to the size of the letters, which might be made 10 or 15 feet high if desired.

The Value of Fruits.

Fruits are of great value in many forms of disease, says Modern Medicine, because of the acids which they contain. These acids, when taken into the blood, break up some of the compounds of waste substances which have been formed, and thus give rise to an increased excretion of these substances through the kidneys. In this way fruits are a great advantage in the treatment of rheumatism, gout, gravel and all the different morbid conditions which accompany the so-called uric acid diathesis. The observations of Haig respecting the relation of uric acid to neurasthenia give to fruit a great dietetic value in this disease. He has shown that neurasthenia is almost always the result of the accumulation within the system of tissue wastes largely in the form of uric acid. The free use of fruits aids in the elimination of these poisons, not only by breaking up the compounds which they form within the body, but by stimulating the kidneys to increased normal activity.

Remembering the interesting fact pointed out by Bouchard, that rheumatism is really a toxemia, resulting from the decomposition of food stuffs in a dilated or prolapsed stomach, we may also attribute the beneficial effects of a fruit diet in rheumatism and allied conditions to its value in suppressing the formation of poisonous substances in the alimentary canal in the manner already pointed out.

Obesity, which is, like rheumatism, a diathesis, may be successfully treated by a fruit dietary. This is due not only to the fact that fruit is a natural food, and thus aids the system to establish normal tissue metamorphosis and a normal balance between the processes of assimilation and disassimilation, but also because it affords a very comfortable means of reducing the amount of nutrient material received to a minimum quantity.

Fruit is chiefly water, the amount of nutrient material it contains varying from five to eight or ten per cent in most fruits, rising to a higher figure only in dried fruits, such as dried grapes, prunes, dates, etc. The writer has succeeded in reducing excessive weight in the most satisfactory manner, by prescribing a diet consisting almost exclusively of grapes or apples, allowing only a small bit of thoroughly dried bread or zwieback in connection with the fruit. In some cases the fruit may be allowed as often as three or four times a day, if necessary to relieve an uncomfortable sensation of emptiness.

In fevers, fruits, especially in the form of fruit juices, are a most convenient and certainly the most appropriate of all foods. It is now almost universally recognized that beef tea and meat preparations of all sorts should be wholly proscribed in cases of fever, as the patient is already suffering from the accumulation of waste matters to such a degree that the addition of even the small amount contained in beef tea or a small piece of meat may be sufficient to give rise to an exacerbation of the disease and lessen the patient's chances for recovery.

Uniforms of New York Troops in the Last Century.

In 1724, each trooper of the city of New York was obliged to provide himself with a horse at least fourteen hands high (fully armed and equipped); a good hat trimmed with silver lace; a black bag or ribbon for the hair or peruke; a scarlet coat trimmed with silver; a pair of boot with spurs; a carbine, etc.

A New York City trooper in 1740 had to provide himself with a good, serviceable horse, not less than fourteen hands high, covered with a good saddle, holsters, housing, breastplate and crupper; a case of good pistols; a good sword or hanger; half a pound of powder and twelve sizable bullets; a good hat trimmed with silver lace; a black bag or ribbon for the hair or peruke; a scarlet coat trimmed with silver; a pair of large boots with suitable spurs, and a carbine well fixed with a good belt, swivel and buckles. The Albany troopers were "cloathed in blew Coats with Hatts laced with Silver" (act of October 3, 1739).

In 1744, the trooper's hat was trimmed with gold lace,

and the coat and breeches were blue, with gilt or brass buttons, while the waistcoat was scarlet.

In 1764, the New York City trooper wore a blue coat and breeches, with yellow metal buttons, scarlet waistcoat and hat trimmed with gold lace.

The uniform of the New York trooper in 1775 was a blue coat and breeches, with yellow metal buttons, scarlet waistcoat and hat trimmed with gold lace; that of the Albany trooper was a blue coat with white metal buttons, and a hat laced with silver; and that of the Kings County trooper was a blue coat and red jacket and a hat trimmed with silver lace (act of April 3, 1775).

English Comment on the War.

Commodore Dewey's dispatches do not add much to what was already known, or rather anticipated, about the Manila affair. From those and one or two private sources it appears that the Spaniards were lying at anchor, without steam up, many of the officers ashore, and the vessels apparently swung end on to the enemy. Anything more insane and disgraceful than the fashion in which the Spanish admiral allowed himself to be caught it is impossible to conceive. The only wonder is that the cry of treachery has not been raised in Spain. Those who raised it would certainly have apparent justification. The torpedo boats placed at the entrance ought, to a certainty, almost to have been able to account for at least one American warship. Inside again, off Cavite, had the Spanish had steam up as they ought to have had, it would have been quite feasible to get to close quarters with some of the American vessels defiling across their front. Had the crews and admirals changed places, the ultimate result could not have been different, but Americans in the "Isla de Cuba," "Reina Christina," and other ships would certainly have managed to foul some of the attacking fleet. Something might have been done with the ram, something with the torpedo; the wildest risk could not have been so foolish as electing to be sunk at anchor. It further appears that the Spanish fired shrapnel shell, since the American reports speak of shell bursting above and around them. Now the thin plates of a cruiser are sufficient to keep out shrapnel bullets, and the use of this projectile rendered the American ships equivalent to ironclads almost. The Spanish had better, like the Chinamen at the Yalu, have fired shells filled with coal dust, for then they would at least have stood a chance of making holes in the American cruisers. Probably they had no common shells, otherwise the results could hardly have been so absolutely one-sided, for very few 6-inch common shells would have been needed to make a very marked effect on cruisers crammed with guns. Admiral Dewey exhibited either sound judgment and knowledge of the enemy or else exceeding rashness; but that had nothing to do with the actual battle. That was practically target practice. If the Spaniards were end-on, they could only bring about half a dozen guns to bear upon the American ships. These last, making allowance for a certain proportion of quick-firers, carried at least fifty of superior caliber and with infinitely better gunners behind them. There were some forts, it is true; but it is questionable whether these contained anything better than a few 68-pounder muzzle-loaders or smooth-bores, unable to reach the enemy. The mine field we should accept with reservation. Our sentiment in the matter is rather of wonder that the Americans took three hours to sink the Spanish ships than in the direction of considering them as having won laurels. There was really no opportunity; it was like our bombardment of Zanzibar.

Turning to other matters, those who desire to hear of a naval fight in the Atlantic, and learn how many interesting problems get solved by the ordeal of war, are gradually losing all hope in the matter. There is a growing feeling that, if there is a battle, Spain will throw away what chance she may have; but there is a still stronger suspicion that presently the missing squadrons will turn up at Cadiz and anchor there. Before these lines are in print events may give them the lie, but the odds are against it. Everything points to the war being but a replica of the Chino-Japanese struggle, save that, unlike the Chinamen, the Spaniards have not even the virtue of being able to shoot fairly straight.

Meanwhile the Americans are preparing to invade Cuba, and without much undue anxiety as to the enemy's "fleet in being." Theoretically rash as this movement is, disastrous as it may well prove to their troops, practically it can be commended in that it at least holds out the possibility of being able to tempt the Spanish ships to cross the Atlantic and face a battle. But if the Americans intend to keep their warships scattered in separate and non-homogeneous squadrons, the risk run may come to be a very real one. The Spanish armored cruisers, all equal in speed, endurance, seaworthiness, gun power and armor, possess a great advantage in being so homogeneous, and the advantage is no light one. True, it is counterbalanced by defects of personnel; but it is early yet to assume that every Spanish commander is an imbecile.—Engineer.

"St. Paul."
"Porter."

"Dupont."

"Terror."

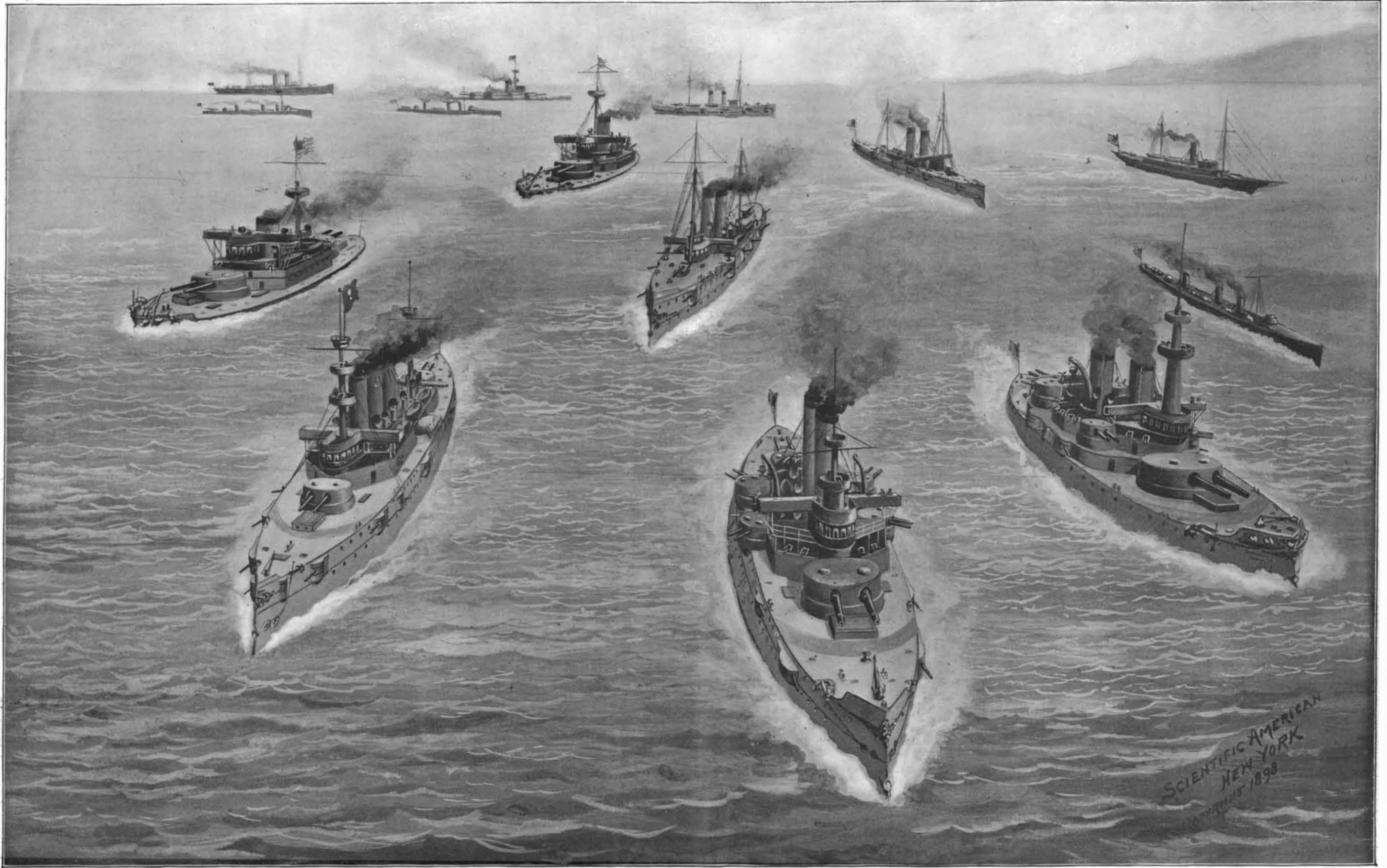
"Amphitrite."

"Montgomery."
"Marblehead."

"Detroit."

"Mayflower."

"Foole."



"Puritan."

"New York."

"Iowa."

"Indiana."

ADMIRAL SAMPSON'S FLEET OFF THE NORTH COAST OF CUBA.

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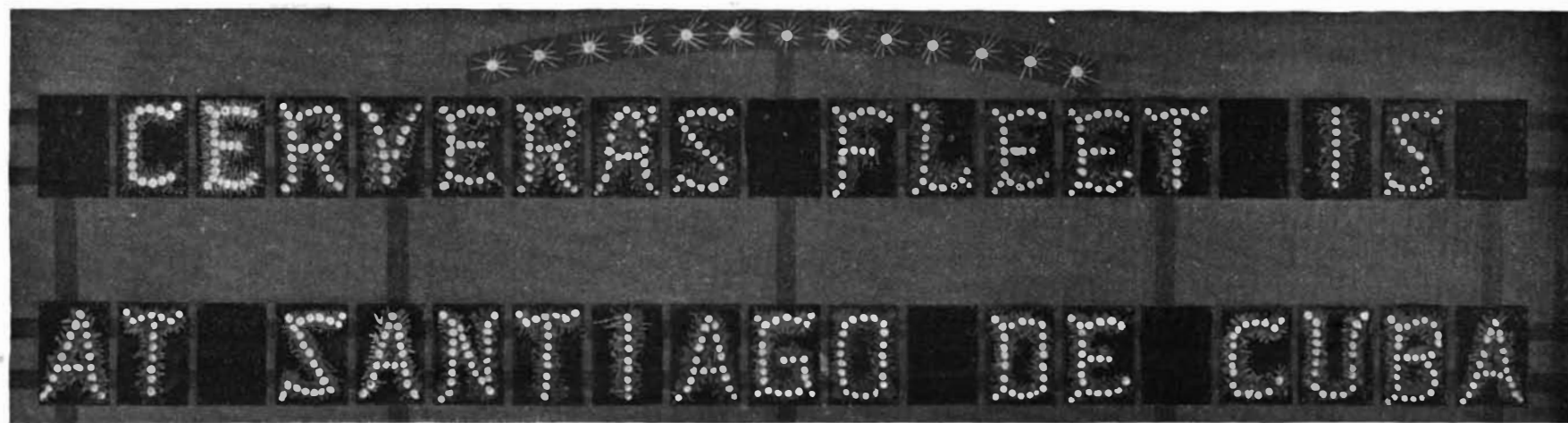
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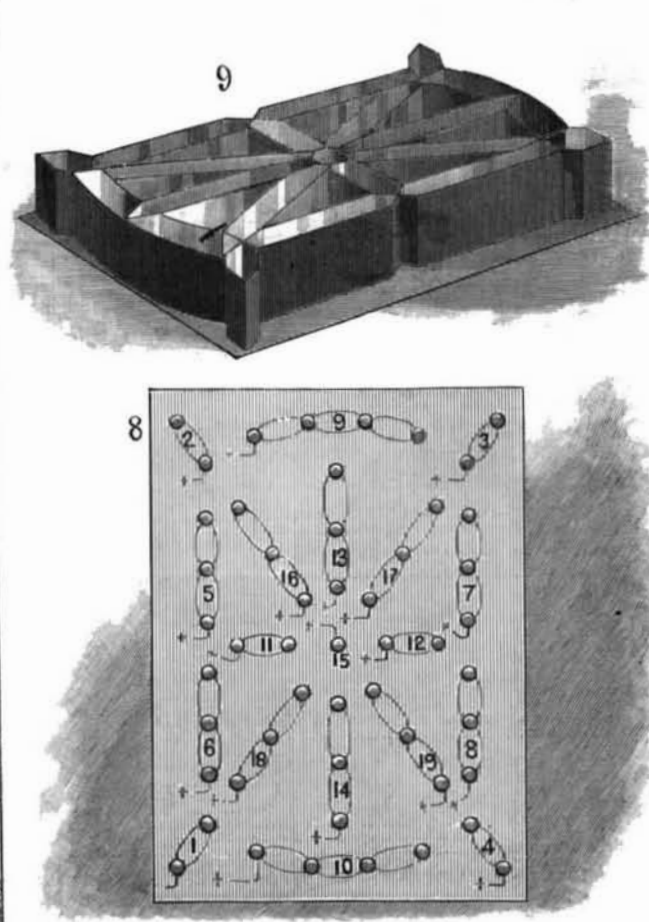
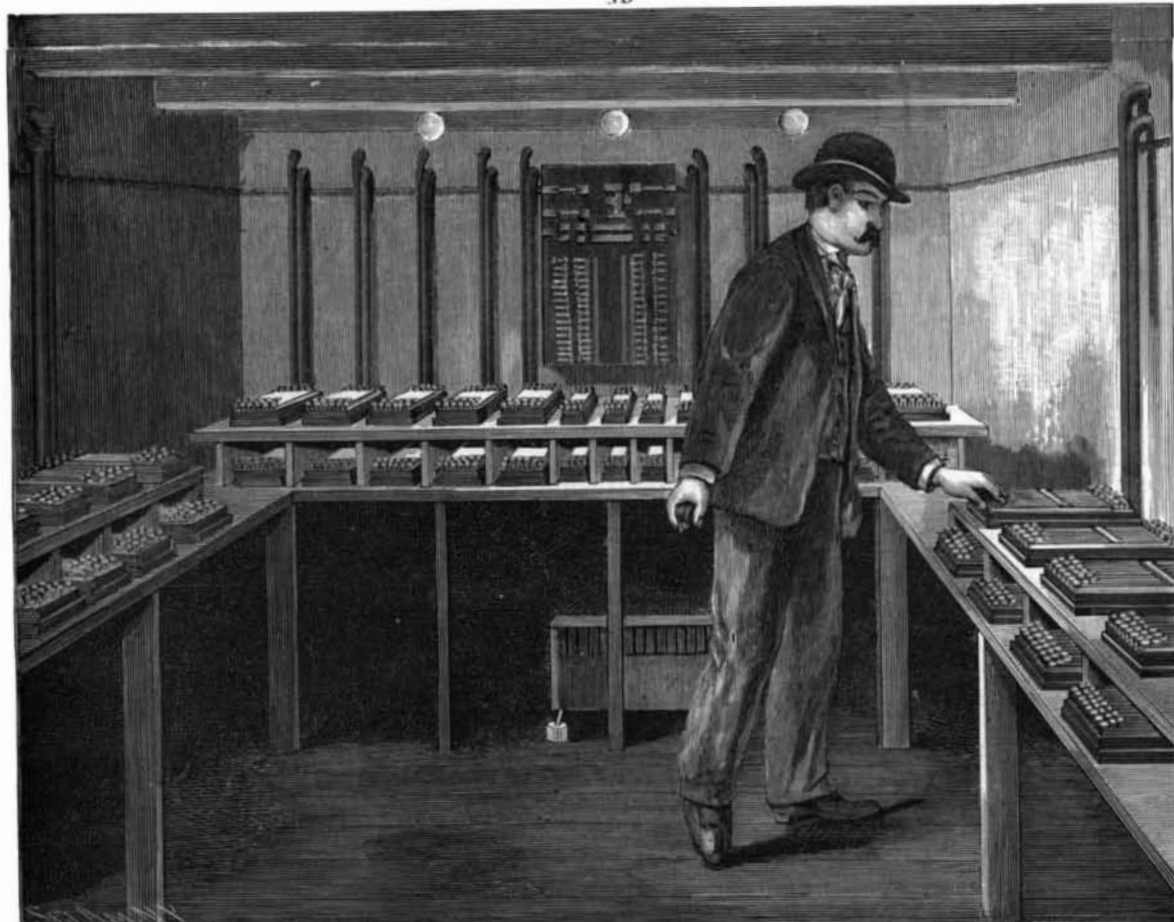
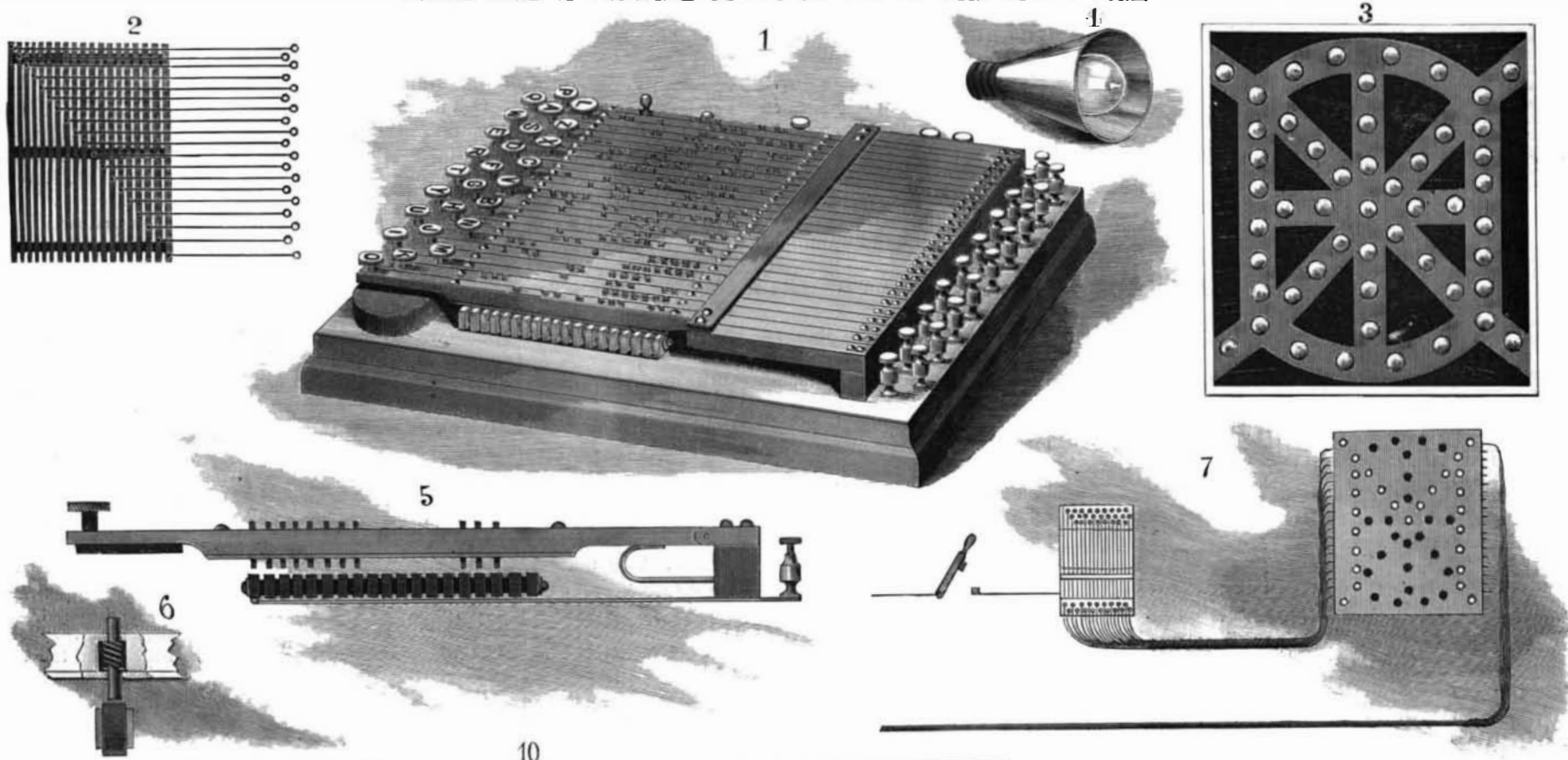
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DOUBLE BANK OF MONOGRAM FRAMES ON WAR BULLETIN AT NEW YORK.



1. A keyboard. 2. Method of wiring the contact bars. 3. A monogram frame. 4. Lamp inclosed in ray-protector. 5. A key, showing contact points and bars. 6. Detail of a contact point. 7. Diagram of keyboard and monogram wiring. 8. System of grouping the lamps. 9. Another form of ray-protector. 10. Interior of operator's room, Madison Square.

NEW SYSTEM OF ELECTRIC SIGNS AND SIGNALS FOR ANNOUNCING WAR NEWS.—[See page 359.]