

contract below and so force the wing downward. With the dragon flies the muscles are in nearly vertical bundles and the operation of the wings apparently depends only on the pull of the contracting muscles. Thus the pull on the pliable tegument between the wings brings the wings up and the pull inward, below, by a heavier set of muscles, brings the wings down. The figures serve to illustrate this far more clearly than it can be described.

Observations in the field are of most interest, and a clover field may be the chosen spot. Here will come the honey lovers, of course, and the predaceous species to prey upon them. Watch one of the big, lazy-winged butterflies soaring over the fragrant blossoms, suddenly arrested by one especially to its liking, turn or drop at right angles by a quick beat of the wings. Here are the hornets, seeking spider, cicada, or other victims and getting them by a dash almost too rapid for the eye to follow. And here is the big Aeschna dragon fly, skimming over the field like a swallow and bent upon a like quest—gnats and midges and other tid-bits whose wings are not quick enough to escape his lightning flashes. Down in the clover a musical buzz commences and quickly grows louder and higher, for a few moments constantly ascending the scale. This is Bombylius, the little yellow, fuzzy, bee-fly, and in the hope of finding him we have brought along a handy little instrument. Now quickly striking a note in tune with its wings we find that the fly's limit is reached at G, above middle C. Musca, the house fly, is credited with 330 vibrations of its wings per second. This corresponds to the note of E in the octave below middle C. But the little bee fly attains nearly 800 vibrations, incredible as it seems; and as the upstrokes hardly resist air sufficiently to occasion sound, it is probable that this means 800 down strokes per second. And there are other flies of the Tachinidæ and certain small Andrenid bees that vibrate their wings at a like tremendous velocity.

DASTARDLY ATTEMPT TO WRECK THE "CONNECTICUT."

In connection with the building and launching of the battleship "Connecticut," there has been perpetrated a crime which, not many decades ago, would have subjected the culprit to the death penalty. We refer to the persistent and pernicious attempts made to wreck that ship, which were only discovered through the careful vigilance of those in charge of her construction. The first attempt was discovered over six months ago, during an inspection of the work already done on the ship; the second on September 14 last, when the divers were making an examination of the under-water portion of the launching ways to see if everything was in good shape for the launching; and the third effort was discovered on the day of the launch, fortunately before any injury resulted to the ship. The various attempts bear strong internal evidence of the fact that they were made by a skilled operator who was thoroughly familiar, not only with the use of shipbuilding tools, but with the conditions attending the construction, inspection, and launch of such a ship as this. The portions of the ship attacked, and the means taken to wreck her during the launch, show that the guilty party or parties understood perfectly well what portions of the ship to attack and what means of obstruction to use, if they would evade the very searching inspection to which a warship is exposed during her construction and launching.

To understand the cunning way in which the attack was planned, it must be understood that, during her construction, the weight of the vessel was carried mainly by three longitudinal and continuous lines of support, namely, a center line of keel blocks, extending practically for the whole length of the vessel, immediately below the keel, and two sets of launching ways located on each side of and parallel with the keel blocks, at a sufficient distance therefrom to give a fairly even distribution of the weight of the ship during construction and to provide sufficient lateral stability when the vessel is carried by the launching ways alone during her passage down into the water. During her construction, every part of the outside of the hull of a ship is open to inspection, except that which is covered by these three lines of support; and should any hole be drilled in the bottom, on the exposed portion of the hull, it will be certain of detection. The criminals who attempted to injure the vessel decided, therefore, to drill through her hull where it rested upon the keel blocks and sliding ways. The first attempt, discovered on March 31, was made in compartment B-87, and immediately against the vertical keel of the ship. This compartment forms part of the cellular double-bottom and the fellow who did the work was therefore in a very remote and secluded place, where, with an accomplice to give

him warning from the manhole that led into the compartment, he might easily carry out his job without immediate detection. For his attack he chose two of the $\frac{7}{8}$ -inch rivets which pass through the flat outer and inner keel plates. First, he chipped off the heads of the rivets on the inside of the ship; then he drilled a $\frac{7}{8}$ -inch hole centrally through each rivet, so that it could be easily driven outward; and then, either by means of a brace, or by using a hydraulic jack set up against the under side of the inner bottom of the ship, he drove these two rivets out of the plating and into the soft wood of the keel block. Here, then, were two $\frac{7}{8}$ -inch holes clear through the ship, with the outside of them concealed by the permanent blocking, and safe against detection. No doubt it was imagined that among the million of rivets throughout the whole ship, these two missing rivet heads would escape detection until the ship was afloat.

Upon the fortunate detection of this attempt, the party or parties determined upon a more deadly plan, namely, that of wrecking the vessel during the delicate operation of launching. To effect this, they selected a spot several feet below low water mark, on the smooth, inclined surface of the starboard launching ways, over which the sliding ways pass when the ship is being launched, and drove into them at about the center of their width a bar of $1\frac{3}{8}$ -inch round steel, leaving some six inches of the bar projecting above the ways. This seems rather an inadequate obstacle to place in the way of an object weighing 7,000 tons, that is moving down-grade, with a speed, say, of 8 or 10 miles an hour, and it is probable that when the ways struck it, the bar would have been bent over and flattened down into the permanent launching ways and the vessel would have passed safely over it. At the same time it is entirely possible that it would have had sufficient resistance to split the sliding ways, and cause a crumpling up and disarrangement of the timbers, that would have slewed the ship and caused her to bind upon the ways, stopping her progress. If so, she would probably have come to rest with one-half of her bulk on the ways, and the other half hanging out in the water. This would not have hurt her so long

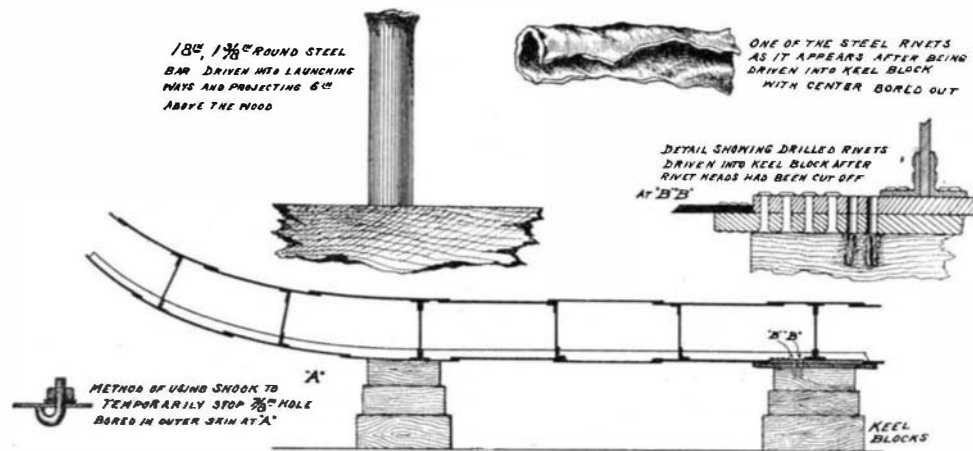


DIAGRAM SHOWING METHODS ADOPTED TO WRECK THE "CONNECTICUT."

as it was high tide and the hull was water-borne; but as the tide receded the support of the after half of the vessel would have been removed, and the enormous bending strain thus set up would have seriously strained her hull, if, indeed, it did not cause it to break entirely in half. Fortunately, the divers found the obstruction, and the piece shown in our engraving was sawn off flush with the ways, leaving the other part of the bolt imbedded.

The third attempt was discovered on the day of the launch, after the ship was afloat, when it was found that water was entering compartment B-88. As soon as the water was pumped down, it was found that a $\frac{7}{8}$ -inch hole had been drilled through the skin plating of the ship, at the point where it rested upon the launching ways. Upon its discovery the hole was temporarily closed by inserting a hooked bolt of the kind shown in our drawing, provided with washers and a nut, which was screwed down firmly from the inside, forming a water-tight joint. Permanent repairs will be made when the vessel goes into drydock.

The intelligence and skill with which the attempts on the ship were made, made it evident to the authorities that they had to deal with a culprit of no mean ability, and orders were immediately given to subject the ship to special surveillance, even to the extent of having special arc lights placed around her from dark to dawn, and setting up a searchlight on one of the adjoining ships to sweep the water in her neighborhood during the same interval. To the lay mind, it will, of course, appear to be an extraordinary thing that such dastardly attempts on a United States vessel should be repeated under the very eyes of the officials who are responsible for her safety. But it must be remembered, on the other hand, that the wreckers chose just those very methods of operation which would bear the appearance to the official eye of being part of the regular workmen's duties. During

the construction of the ship there are hundreds of men at work with chipping hammers and drills. Also with regard to the attempt on the launching ways, it would be possible for any one of the divers who was sent down to do work upon these ways, to drill the hole and with a few strokes of the hammer drive in the iron bar. The crime, in regard to the difficulty of detecting it, was as easy of performance as the misplacing of a switch or a signal in an attempt at train wrecking.

It is sincerely to be hoped the man or men who did this work will be brought to the severest justice that can be dealt to them. Speculation as to who the guilty parties are, and what their motive, is idle. But it is generally supposed to be either the work of some disgruntled workman, or of some demented person with a mania for wrecking the ship. It is also remembered that in the earlier stages of the construction of the vessel there was trouble with the labor unions, some of whose representatives had to be forcibly expelled from the navy yard. The indignation among the workmen employed on the ship, who as a body have taken the greatest interest in her construction, is unbounded, and it is probable that from the men themselves the clues leading to the detection of the wreckers will be obtained.

Roman Forum Excavations.

One of the most important finds which has been made lately by Comm. Boni in the Roman Forum is that of a tomb which dates back to the foundation of the city. It is one of the most ancient of all the late discoveries. The excavation was made in a spot which had not been touched before, a few square yards of ground under the Temple of Antoninus and Faustina, near the Arch of Septimius Severus. Below the foundation of the temple Comm. Boni found six different layers of ground. The last layer covered a slab of greenish-gray tufa which was broken in several fragments. Under the stone lay a great vase or pot (*dolium*), at the bottom of a shallow pit. The *dolium* contained nine different vases, one of which was an *olla* filled with calcined bones. There was no doubt that they had uncovered a burial place. The main containing vessel, or *dolium*, is a vase or pot of unusual size; the material is of red terra cotta. It is very thick and seems to have been made by hand and polished with a spatula. The vessel is burned in several places and blackened in others. It measures 17 inches in diameter at the top border, 21 inches in the middle or largest part, and 10 inches at the bottom. It has a cover of tufa stone which is rounded and resembles a tortoise shell in form. The *olla* or pot containing the bones is relatively small and is 10 inches high. It is also made of red clay, but of a more careful workmanship, with an overturned border and lugs or ears which are provided with rings. The cover of this pot has the form of the roof of a Latin cottage or hut. The *olla* contains the remains of a body which had been burned on a funeral pyre, with debris of half-burned bones and fragments of skull. Dr. Roncali estimates that the individual was about thirty years old. Around the burial urn containing the bones which occupied the center of the *dolium* were disposed the different vases and other objects which were buried with the dead as in the usual case. These latter objects are modeled of a blackish earth and formed by hand. Their surface is finished by strokes of the spatula. The objects comprise two pots for containing preserved food with strokes in relief to imitate the basket-work with which the ancients protected such vessels; a *poculum* (goblet) channeled on the surface, which probably had a wood cover originally, but the latter had rotted away; a lamp of the usual flat form, a large cup and three small cups with handles. These objects recall the specimens of the same kind which have been found in the most ancient tombs of the Alban burial grounds and elsewhere. They resemble those of the Velletri and Ardea sepulchers, also those of Tarquinia and other Etruscan cities. On this account the present find is of the greatest interest on account of the place where it was located. There seems to be no doubt that the tomb dates from the period of the foundation of Rome. When the Forum became the center of the city such burial places were no longer allowed.

The coal transporter at Rouen, connecting the river Seine with the docks, is 600 feet in length, and has a raised platform 50 feet in height on the quay side of the river and 30 feet on the dock side. This transporter, which is said to be the largest in the world, is supported by three arches, sliding on rails, and under the wagon is suspended a huge bucket, capable of holding 32 hundredweight of coal.