modore that it would be useless for him, with his wooden ships, to attempt to battle with forts so thoroughly prepared to resist an attack. The gallant Commodore replied that he was sent by his government to make the attack, and *intended to try it on at all hazards.* Our fleet had to contend with regular casemated forts, heavily-armed land batteries, iron-clad gunboats, rams, turtles, chains, floating rafts, fire ships, &c., all of which had to give way in the presence of the skill and bravery of our gallant tars.

ANOTHER NAVAL ENGAGEMENT.

A naval engagement came off on the 10th inst. near Fort Wright, on the Mississippi, between Commodore Foote's fleet of gunboats under command of Capt. Davis, and the Confederate fleet, under Capt. Hollins. The Federal gunboat *Cincinnati* was run into and injured by the *Louisiana*, but will soon be again repaired. The rebel ram *Mallory* attempted to do the same thing for the *St. Louis*, but was destroyed in the attempt. The rebel fleet retired down the river—satisfied for the time being that it would be useless to contend further. The Memphis *Argus*, in an article on gunboats, says :—Thus far, it must be confessed, our attempts with the gunboats on the river have been a disgusting fizzle. The people know it, and so does the government.''

THE FLEET OFF MOBILE.

The Petersburg (Va.) *Express*, of the 9th inst., publishes a dispatch from Mobile which states that the advance of the Federal fleet, consisting of seven vessels, are off Fort Morgan and ten more off Horn Island, moving Eastward. This confirms the announcement of Com. Farragut, that he intended to follow up the stampede of the enemy to Mobile. Stirring news may soon be expected from that quarter.

CHAIN-CLAD SLOOPS-OF-WAR AT NEW ORLEANS.

The most conspicuous feature in the outward appearance of the Federal fleetwas the iron-linked mail of the sloops-of-war *Richmond*, *Brooklyn* and *Pensacola*, each of which had their engines and boilers protected by chain-cables hung in bites on the outside and triced to eye-bolts and rods running fore and aft. The chains were propped from the hight of the gun-deck to below the water line, and connected together by strong cordage. This was equivalent to four inch plates, provided it withstood the effects of glancing or oblique shots. The only danger apprehended from the chains on the steamers was from raking shot tearing them off, in which case it was feared they would become entangled with the propellers. To guard against this, some of the ships unshackled the chain in short lengths, so that it might reach astern. The machinery of the Iroquois was protected in the same way, the credit of originating which plan is due to Assistant Engineer Hoyt of the *Richmond*, upon which ship it was first adopted, the other vessels following her example.

Among the most efficient of the internal arrangements for the protection of the boilers, the destruction of which by a shot or shell was the most to be dreaded, although this was not the only dangerous part of the ships, was that adopted on board the sloop-of-war *Mississippi*, the machinery of which, being more above the water line, was consequently more exposed to the fire of the enemy. The preparation of this ship for the action involved an immense amount of labor, which engaged her officers and crew for weeks before the attack. Under the direction of Chief-Engineer Lawton, Mr. Bartleman, the First-Assistant, worked night and day with a strong force, and constructed a temporary roof in the coal bunkers just below the water line, about which the heavy chain cables of the ship were packed in layers, running fore and aft. The ends of the shaft of the *Mississippi* were protected by four bales of baggage on the outside of each wheel. The bows of several of the ships, including the *Richmond* and *Hartford*, were protected by sandbags piled up beneath the forecastle, and intended to be removed aft to break the force of raking shot after the ships should have passed the forts. The bulkheads of other gunboats were strengthened in like manner, and also by sand bags, and the coal bunkers of all being kept full, supplied the wants of extra barriers to shot and shell. From the moment the sloop-of-war *Portsmouth* arrived in the river, her officers and crew were engaged in putting the ship in fighting trim. She wore a mail, constructed of her sheet chains, for the protection of her bow against a raking fire, and spread a complete spar netting of strong ropes to prevent her lofty spars—cut away by cannon balls—from falling on deck.

SKILLFUL PREPARATIONS.

The sloop-of-war *Richmond*, taken altogether, was by far the best fitted ship in the squadron. Her hull, standing rigging, and in fact every part of the vessel which could afford the least mark for the rebel artillerists, received a coating of mud paint; she wore splinter nettings, inside of her bulwarks, and spar nettings running fore and aft over her decks. In addition to the iron mail, which she wore externally, her machinery was protected by sand bags, packed against her bulk-heads.

The gunboats *Katahdin*, and the *Harriet Lane* wore their boarding nettings, and other gunboats and ships were provided with the same barriers against the enemy. Many of the ships carried kedge anchors on their yard arms, and grappling hooks on their jib booms, with which to fasten to the gunboats and fire rafts of the enemy.

All of the sloops-of-war carried howitzers in their tops, those on the *Hartford* and *Mississippi* being inclosed with plates of boiler iron for the protection of the men, while the *Hartford*, *Pensacola* and *Brooklyn* wore a seven of cordage around their fore and main tops.

Over nine thousand shells were thrown by the fleet in the bombardment of the forts below New Orleans. Most of them were 13-inch shells which cost with their filling nearly $20 each.

RE-OPENING OF SOUTHERN PORTS.

The President of the United States, by proclamation, announces that on the 1st of June the ports of Beaufort, N. C., Port Royal, S. C., and New Orleans will be re-opened to commercial intercourse, except as to persons and things and information contraband of war.

LAUNCH OF THE NEW IRON-CLAD SHIPS.

The new iron-clad ship-of-war, built by Messrs. Cramp & Son, of Philadelphia, was successfully launched at Kensington, Philadelphia, in the presence of an immense crowd. The christening was performed by the veteran Commodore Stewart, of the old *Ironsides*, at whose suggestion the name of *Ironsides* was given her. She will be a very formidable vessel, and is expected to go into service about the 1st of July.

Cause of the Motion of Camphor on Water.

Mr. Charles Tomlinson recently made a communication to the Royal Society detailing his investigations into the cause of the singular movements of small pieces of camphor when floated upon water. This phenomenon has long been known, but has never before received a satisfactory explanation. Mr. Tomlinson finds that the movements only occur when the camphor is placed upon perfectly clean water, contained in a clean vessel, and that they may be imitated by smearing any small floating objects with a volatile liquid, such as ether, chloroform, &c., and the floating it upon water; when the camphor or other volatile substance, being slightly soluble, spreads in a film over the surface of the water. These films are, however, not given off uniformly, but separate more quickly from the sharp angles and broken surfaces than from the smoother parts of the camphor, &c., and passing off in straight lines re-act upon the fragments of camphor, causing them to rotate in the opposite direction to that in which the film is passing off. Mr. Tomlinson has devised an ingenious method of rendering these films visible, by fixing the pieces of camphor and then dusting the surface of the water with lycopodium powder, when the currents produced by the passing off of the films are rendered distinctly visible. The irregularity of the movements depends greatly on the influence exerted by the different pieces of camphor on each other, and also on the attraction of the sides of the vessel. It may be noticed that a piece of camphor, when placed in water, wastes much more quickly at the surface of the fluid than above, where it is exposed to the air, or below, where it is acted upon solely by the water; this is owing to the film which is constantly being formed, and which evaporates into the air as rapidly as it is spread out on the surface of the water. Whatever interferes with rapid evaporation tends to arrest the singular phenomenon; therefore the movements are not nearly so lively on a dull, foggy day as on a bright, shining one, when evaporation goes on with great rapidity. Any fixed oil, or the slightest greasiness of the water, or of the containing vessel, will, by producing a fixed film on the surface, prevent the formation of the camphor film, and so interfere with the occurrence of the interesting movements.

UNITED STATES CIRCUIT COURT—OHIO.

Manufacture of Candles—Important Patent Case.

Tilghman vs. Werk.—A very important chemical case was recently decided at Cincinnati. It was heard before Judge McLean and Judge Leavitt, shortly before the death of Judge McLean. It involves a saving, it is said, of nearly one cent a pound in the manufacture of candles. The outline of the case is as follows. Richard A. Tilghman, of Philadelphia, invented a process for decomposing neutral fats into fat acid and glycerine by the simple use of highly heated water under pressure. Prior to his invention the neutral fats were decomposed into fat acid and glycerine by the use of lime and sulphuric acid, or the glycerine was destroyed and the fat acid set free by another process. A patent was granted to Tilghman on October 3, 1854, and a suit was brought against M. Werk, of Cincinnati. The defendant alleged that the plaintiff was not the original and first inventor of the process patented, but that substantially the same process was described in Payen's Chemistry in the year 1851; in Regnault's Chemistry in 1853, and in Roret's Encyclopedia. The defendant also denied that the process or plan employed by him was infringement of the complainant's patent. A large amount of scientific testimony was taken, among others, Professor R. F. Rogers, James C. Booth, Professor Wayne and Grasseli were examined. The case was argued by George Harding and Henry Stanberry for complainant, and by Charles Fox and Nathaniel M'Lean, Jr., for defendants. Judge Leavitt delivered the opinion at the last term of the Court. A motion was afterward made for a rehearing before Judge Swayne and Judge Leavitt, and refused. The points decided were the following :—

1. Plaintiff's invention consists in a process for manufacturing free fat acids and glycerine, by the action of water in a liquid state above the ordinary boiling point of water, and consequently under pressure on fatty bodies or substances.

2. The invention is based on a discovery made by plaintiff that water highly heated and under pressure, of itself, possesses a chemical power of decomposing fat bodies into their elements, fat acid and glycerine.

3. This invention and discovery are not contained in the books relied on by the defendant. Regnault's and Payen's process acts by destroying the glycerine, and does not mention highly-heated water under pressure as the decomposing agent, and is therefore unlike the plaintiff's.

4. Milly & Motard's process, described in Roret's Encyclopedia, although using a close boiler containing fat and water under a high temperature and pressure, yet does not rely on the chemical decomposing power of highly-heated water, but requires the presence of lime to combine with all the fat, and thus prevents the formation of any free fat acid, and is therefore unlike the plaintiff's.

5. Arthur Dunn's process by use of soda is similar to that of Milly & Motard, and unlike the plaintiff's.

6. The plaintiff's invention is a useful and practical one.

7. The description of the process is sufficient in the specification. A fixed rule is there given, which will certainly insure success, and it is also made known that certain variations may be made without changing the process.

8. A principle and a process distinguished. The invention claimed by plaintiff is not merely a principle, but also a process by which that principle may be made practical and operative.

9. The process used by defendant is an infringement of plaintiff's patent :—

I. Defendant uses and requires water in his process.

II. That water is highly heated and under pressure.

III. That water decomposes a certain portion of the fatty body into free fat acid and glycerine, and to this extent infringes.

IV. The defendant also employs six or seven pounds of lime to one hundred pounds of fat, and thus converts a certain portion of fat into lime soap, and that portion of the operation does not infringe.

10. Where a patent is for a process a defendant cannot avail himself of the process to a partial extent without infringing.

11. The amount which the plaintiff should recover is to be measured by the profit which the defendant has derived from the adoption and use of the plaintiff's invention.

INJURIOUS ACTION OF IODINE ON THE TEETH.—The *Dental Cosmos* says :—M. Stanislas Martin has found, as the result of repeated inhalations of iodine in the treatment of phthisis, that the gums become very sensitive and swollen. The alveolo dental periosteum next suffers, and the teeth soon lose their solidity. The mouths of some persons, however, seem insensible to the iodine. He has formerly shown that sugar and camphor exert a deleterious action on the teeth themselves, decomposing them and leading to their loss; and he believes that the same is true with regard to iodine, which especially attacks the carious teeth, and those the enamel of which has become damaged by the heat communicated to the mouth by smoking. He has now under examination some teeth completely saturated with iodine.

WE are indebted to Hon. Ira Harris, for valuable public documents, also to Hon. Mr. Kellogg and Hon. Mr. Casey, for similar favors.