

**AN EFFICIENT AND ECONOMICAL STEAM LAUNCH.**

The great objections, heretofore, to the more general use of small steam yachts and launches have been the difficulty in carrying fuel to run them, coal being principally used, and the cumbersomeness and want of adaptation of the engines, which required a trained engineer to operate the machinery. These difficulties have been largely overcome by the introduction of the Shipman automatic steam engine, using kerosene for fuel, of which we published a description in September, 1884, and an improved form of which, styled the Boston model, is illustrated herewith.

The boilers of these engines are made of wrought iron and steel, tested up to 350 and 400 pounds hydrostatic pressure, and designed to be absolutely safe against either fire or explosion. The fire is formed by steam and oil discharged together in a very fine spray through an atomizer into the fire box, and the supply of kerosene is automatically controlled by the steam pressure in the boiler operating upon a diaphragm, which may be set at any desired limit, so that when the pressure reaches this limit, the supply of oil is entirely cut off until the pressure drops again.

The oil tank is placed at any convenient distance from the fire box, and there is not as much danger in using petroleum, in the way it is supplied by this system, as in its ordinary burning in lamps. The water supply is also automatic, the feed water pump being in operation whenever the engine is in motion, and a ball float connected to the cut-off valve in the pump regulating the supply.

The combustion is as perfect, and ordinarily as free from smoke, as that of a well trimmed lamp. Until steam pressure is obtained in the boiler, an

air pump is worked by hand to feed the fire, which never requires more than a few minutes, the fire thereafter taking care of itself, just sufficient oil being then automatically supplied to keep the steam pressure within the limit which has been set. This arrangement secures perfect economy in the use of fuel, as the supply of oil fed to the fire box is always controlled by the amount of steam taken to work the engine, the engine itself putting out its fire when no steam is taken, and relighting it again. The average quantity of oil used per horse power per hour is said to be about two quarts, of a quality equaling 110° to 115° test.

The simplicity of construction and the excellence of material used in this engine, with its automatic water and fuel feed, requiring no attention at any time, admirably adapt it for all uses where it is desired to dispense with the services of a fireman or engineer, while its compact form renders it especially available for use on small steam yachts and pleasure boats.

The Shipman engine, since its first introduction, has been steadily growing in favor for all uses where only a moderate power is required, but it has been an especial favorite as a means of affording power to propel small boats, which has led the company to design and construct a series of launches especially calculated to attain the greatest speed with safety. These launches, of which our illustration shows the design, are made in four different sizes, from 22 to 32 feet long, to be propelled by engines of one horse to six horse power. They have a composition metal propeller, copper oil and water tanks, filter and steam condenser, and all other parts necessary to a complete equipment, and the engine and machinery are fitted to each boat by

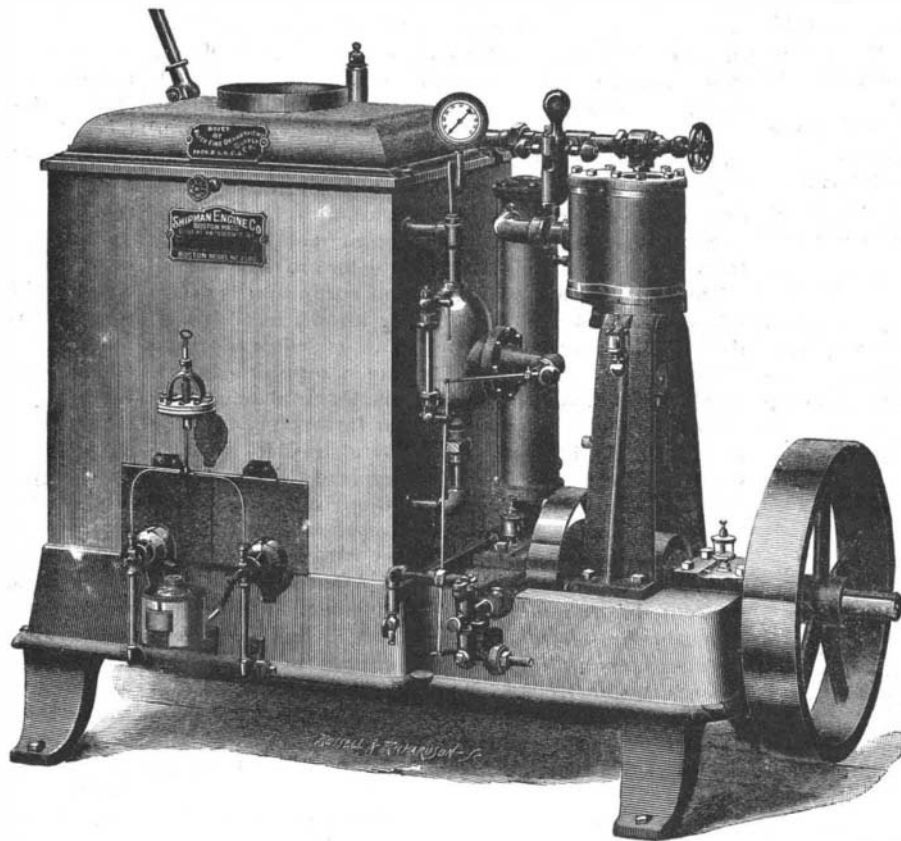
trained and experienced workmen. The United States supervising inspectors of steam vessels have approved the use of this petroleum engine on vessels, and its use on all government waters is readily allowed.

This engine is popular and efficient for all stationary purposes as well as for marine work. The main office of the Shipman Engine Company is at No. 92 Pearl Street, Boston, Mass., with a New York office at 12 Cortlandt St.

**Quick-Firing Batteries Charging Infantry.**

The part to be taken by quick-firing guns in the war of the future is just now exciting, and quite naturally, much discussion. Military minds differ materially as to the size, weight, and character of the guns, and the methods of using the same; and recently, when Mr. Nordenfeldt, the well known machine gun maker, spoke on the subject before the Royal United Service Institution, he found many to differ with him, some

lost all in a few moments, had not their infantry come up. At Gravelotte, four batteries of the 7th corps advanced up close to the French line, but were almost annihilated. Toward the end of this same battle the French advanced on the Prussian infantry line with a mitrailleuse battery and were actually driving it back, when the field artillery was brought up and checked it. This is a truly remarkable case where an infantry attack was repelled by artillery. Now, however, when machine guns have been improved and provided with shields to guard their gunners, it is thought that such occasions will not be so rare in the future, indeed, that the advance of artillery (a rapid-fire battery) close up upon infantry will be neither impracticable nor uncommon.



THE SHIPMAN KEROSENE BURNING ENGINE—BOSTON MODEL.

widely, nor may it be said that, even when opportunity offered to answer the objections raised to his conclusions, was he able to clear up the uncertainty as to where quickness of fire should give way to weight of projectile. He cannot see, he says, any advantage in increasing the projectile beyond 8 pounds—his greatest caliber; for then, though you get more effectiveness, there is a recoil that throws the carriage out of position and seriously disturbs the range once got; the gun, too, being heavy and awkward to handle, and requiring the use of a hand spike in the hands of him laying it, while now he may readily follow, while firing, the movement of the enemy's line, and judge from the effect of one shot how he ought to lay the gun for the next. The feeling among artillerists, however, seems to be that the machine gun's caliber should be increased to fire 12 pound projectiles, like the horse artil-

lery arm. As to handling them in the future, it is likely there will be great changes, for now the gunners are protected. In the Franco-Prussian war, where the machine gun, the mitrailleuse, of small bore was used, it was found impractical to attempt to bring up even these quick firers in the face of infantry fire. It is true that at Spicheren two Prussian batteries were advanced to within 800 yards of the French infantry line, but they lost half their men, and would have

with great care. Children, indeed, should not be allowed to fire them, except when under adult observation.—*Mail and Express.*

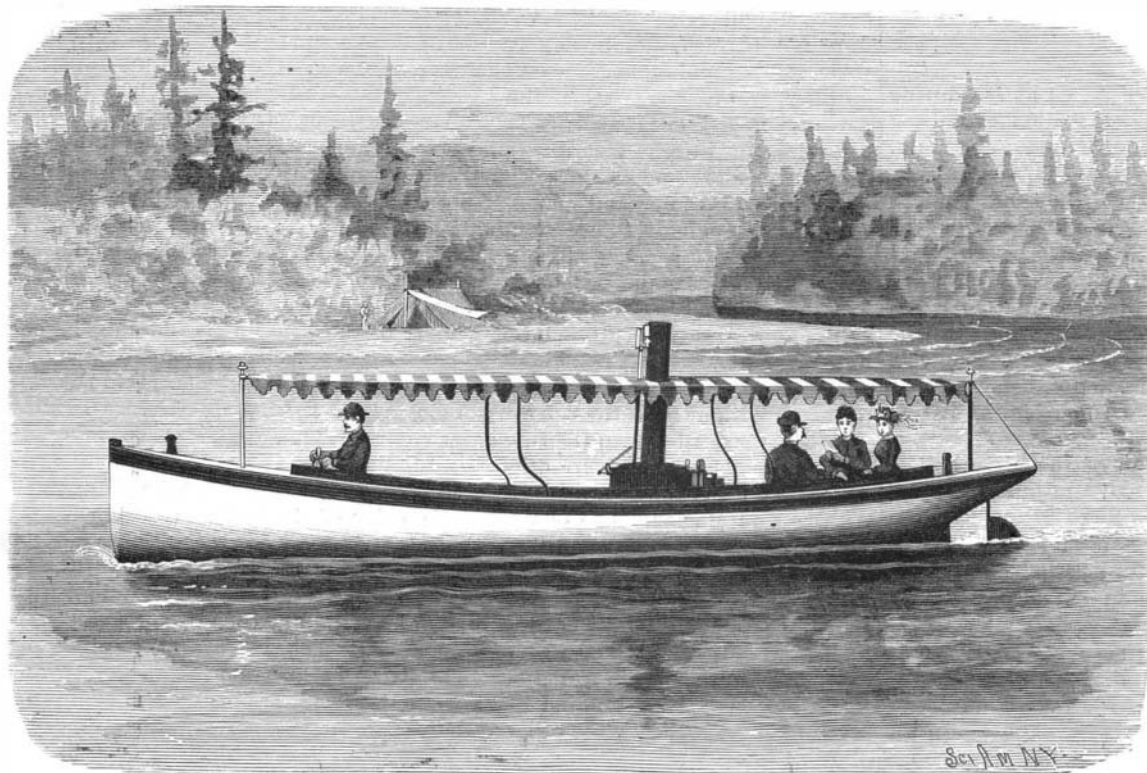
To all of which we say amen, except as to the impossibility of successfully manufacturing fire crackers in this country; that is to say, if our neighbor lays it to a lack of scientific knowledge or mechanical ability. As a matter of fact, the reason that we import Chinese crackers is that, living as he does upon nothing a day, the Chinaman is enabled to turn out the smaller of the explosives for about two cents a pack—a price against which the American manufacturer and workman find it useless to try to compete. The quality of the wares made here is equal to or better than that of the imported article. Of the larger, or so-called cannon crackers, great numbers are made and sold here, and no one who has ever had one of the wretched, incendiary, murderous nuisances explode anywhere about his feet will deny that in the matter of detonation they accomplish all that the makers could wish.—*Fire and Water.*

**A Lightning Flash.**

In the *Elektrotechnische Zeitschrift* of March last, W. Kohlrausch has given some estimates of the current and quantity of electricity in a lightning flash. He calculates that it would take 9,200 amperes to melt a copper rod of 2.5 centimeters diameter. Preece's constant—Proc. R. S., March, 1888—makes it 10,244. Such a current concentrated in a flash would contain from 52 to 270 coulombs, which would decompose from 5 to 25 milligrammes of water and from 9 to 47 cubic centimeters of explosive gas. If this energy were stored up and distributed for electric lighting, it would require from 7 to 35 such flashes to

keep one incandescent lamp alight for an hour.

ONE of the new applications of a waste product to a useful purpose is the manufacture of paper out of cedar wood pulp, for underlying carpets, wrapping of wool, furs, etc. The paper makers procure the cedar chips of pencil manufacturers, and the paper made of this material will, it is claimed, preserve articles wrapped in it from the moths.



NEW MODEL STEAM LAUNCH FITTED WITH SHIPMAN ENGINE.