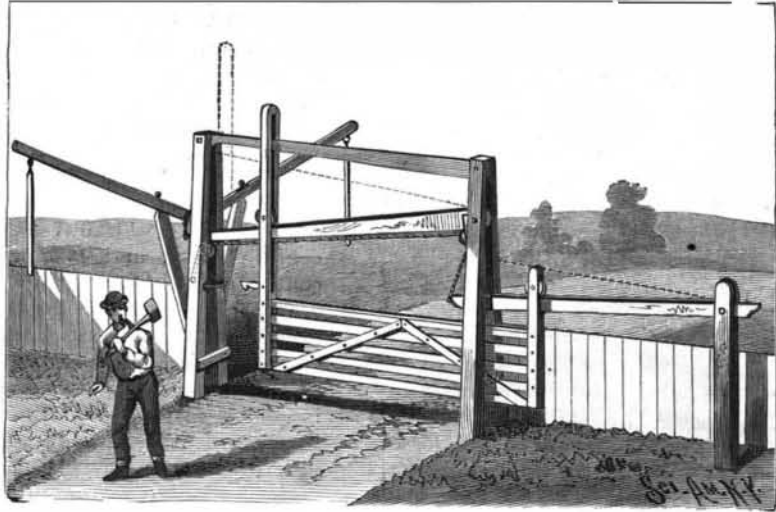


**AN IMPROVED SLIDING GATE.**

The invention herewith illustrated covers a gate construction which presents several novel features. The gate is of the kind intended to be readily opened by one approaching it in a vehicle or on horseback, without alighting, and as readily closed after passing through. To a post at the right side, at a distance of the length of the gate, is pivoted a bar which extends through the upper end of the rear stile of the gate. This bar has on its upper face a metallic track, upon which rides a roller mounted in the upper end of the



VON STEIN AND WHITE'S GATE.

rear stile, the bar also extending through one of the double posts of the main gate frame. Another bar pivoted higher up in this double post, and carrying a like track on its upper face, extends across the roadway, through the upper end of the forward stile, and between the standards of the other double post, a roller mounted in the forward stile also riding upon the track on the upper face of this bar. To the inner end of the first bar is attached a rope or chain, which passes over a sheave on one end of the other bar above it, the rope passing along the under side of the latter bar, and over a second sheave, to a fastening on the post at the forward end of the gate. The upper pivoted bar, the one extending across the roadway over the gate, as seen in our illustration, is supported on its forward end by links connected to levers which extend out on either side of the roadway, these levers having swinging handles. To open the gate, a pull upon one of these handles raises the two bars carrying the tracks upon which the rollers in the stiles ride to the position shown in the dotted lines, when the gate rolls back from the road, and is held open, though slightly raised from the ground, through the medium of the levers and their swinging handles, the weight of the latter being so adjusted as to slightly overbalance that carried by the short arm of the levers. To close the gate, one of these levers is pushed upward, when the track-supporting bars are moved so that they incline downward, and the gate rolls to its closed position.

This invention has been patented by Messrs. James P. Von Stein and Henry A. White, of North Liberty, Johnson County, Iowa.

**A Mechanical "Porpoise."**

At a recent meeting of the Liverpool Engineering Society, a paper was read by Mr. J. F. Waddington on "Submarine Vessels." In commencing the paper the

author said that there were records of submarine vessels as far back as 1648, and a very interesting series of experiments were made by Fulton in 1801. Submarine vessels, he stated, were used in the American civil war, and numbers of patents had been taken out in America. He then referred to the submarine vessel Resurgam, designed by Mr. Garratt, and tried in the Birkenhead Float, in 1879, and also to the Nordenfolt boats. His own submarine vessel, the Porpoise, which was tried last year, was then described. She was 37 feet long by 6 feet 6 inches beam, and was propelled by electricity. The Porpoise was submerged when under way by means of inclined planes, which, when the buoyancy of the vessel had been sufficiently reduced by letting in water, were set over at an angle, and so guide the vessel below the surface. He also described the horizontal propellers working in vertical tubes used in his boats for the purpose of diving below in cases of emergency when there was no way on the boat. The tendency of submarine vessels to dive by the head when going at any speed was prevented by means of a horizontal rudder. Compressed air for consumption by the crew was carried in two compartments at the ends. For the propulsion of the vessel and for driving the various machinery on board, electricity was stored in 45 accumulators of 600 ampere hours' capacity. The author stated the speed of the

boat with the 6.77 horse power available would be about 8 miles per hour, at which speed she would be able to run a distance of 80 miles.

**IMPROVED BACKUS FURNACES.**

This furnace, which is one of the newest types manufactured by the Backus Company, of 505 Fort Street, West, Detroit, Mich., and for which they have been granted a patent, has for its object the complete consumption of the products of combustion before reaching the furnace chimney. The principal features of the chimney are a brick arch abutting against the door, and having air ducts leading from the ash pit up to the spring of the arch, for increasing the draught and introducing increased quantities of oxygen. The dump grate is pivoted behind next to the bridge wall, which is made elongated and receding. Through the flues or ducts a large quantity of air is admitted at the front, and then passing over the fire, under the arch, mingling and igniting with the carbon beyond the arch, insuring a perfect combustion of the gases before they reach the surfaces or flues of the boiler. The complete burning of the fuel that here takes place gives clean flues and a rapid radiation of heat, a large economy of fuel and a smokeless chimney. Cut No. 1 shows the furnace as used with an ordinary boiler. The other engraving represents a furnace constructed to burn shavings and light fuel, and is admirably adapted for use in planing mills and woodworking factories.

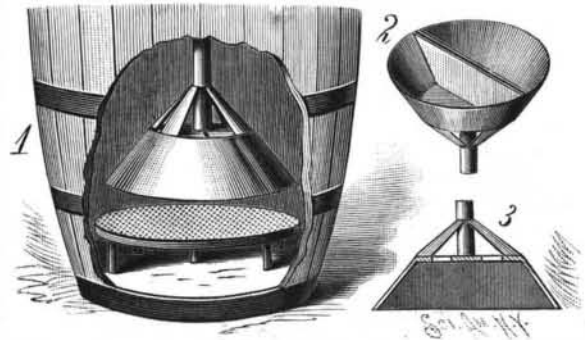
**The Fastest Steam Vessel.**

The London *Engineer* says: The daily papers are publishing a statement leading to the notion that the fastest vessel afloat has been made by Messrs. Thornycroft &

Company, who, "in making preliminary trials of a torpedo boat built by them for the Spanish navy, have obtained a speed which is worthy of a special record. The boat is twin screw, and the principal dimensions are: Length, 147 feet 6 inches by 14 feet 6 inches beam, and 4 feet 9 inches draught. On a trial at Lower Hope on May 27, the remarkable mean speed of 26.11 knots was obtained, being equal to a speed of 30.06 miles an hour, which is the highest speed yet attained by any vessel afloat." If our readers will turn to our last impression, they will see that Messrs. Yarrow & Company have attained as a maximum with a similar boat a speed of 27.277 knots, or 31.44 miles per hour.

**AN IMPROVED CLOTHES WASHER.**

The invention herewith illustrated consists of a novel



FAUNTLEROY AND OSBORN'S WASHING MACHINE.

dasher, in the shape of an inverted, flaring cup, in combination with a perforated platform, supported above the bottom of the tub, for holding the clothes in position to allow the water to freely pass through them. Fig. 1 shows the device in partition for use as in an ordinary tub, with the wall partly broken away, and Fig. 2 is a view of the dasher inverted. The dasher is divided diametrically by a hollow position, which forms an air passage communicating between its lower part and the space above through two apertures, indicated in Fig. 3 on either side of the handle. The ferrule which receives the handle is attached to the center of the cup, and is

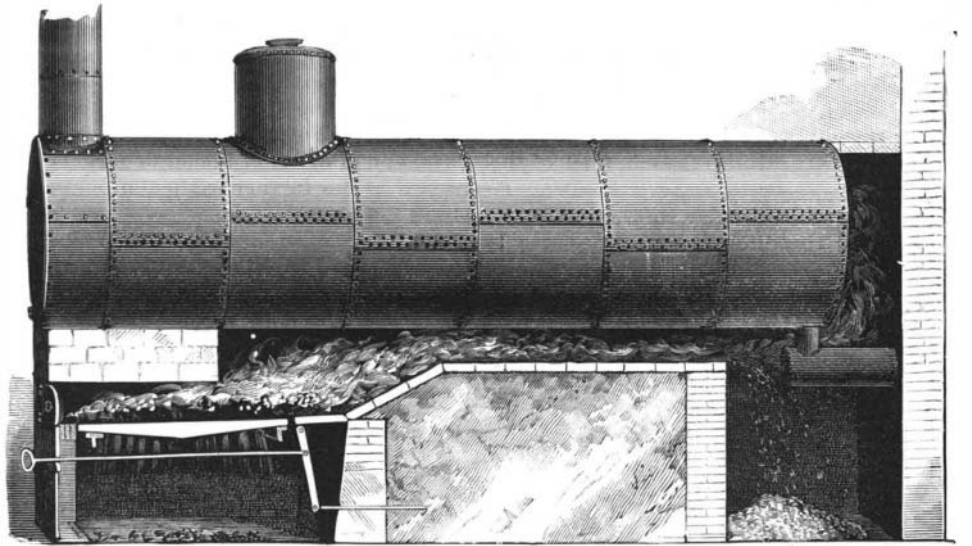


Fig. 1.—NEW BACKUS "PERFECT COMBUSTION FURNACE."

strengthened by diagonal braces connected with the ferrule and with the top of the cup.

This invention has been patented by Messrs. John B. Fauntleroy and Chester S. Osborn, of De Kalb, Mo.

**Solidification of Petroleum.**

Dr. Kauffmann is at present making some experiments for the Russian government, with the view of finding a process of solidifying the petroleum used as fuel. According to report, his process consists in heating the oil and afterward adding from one to three per cent of soap. The latter dissolves in the oil, and the liquid upon cooling forms a mass having the appearance of cement and the hardness of compact tallow. The product is hard to light, burns slowly and without smoke, but develops much heat and leaves about two per cent of a hard, black residuum.—*Annales Industrielles.*

**A New Asparagus.**

Some little interest has been excited by the announcement of the discovery of a new and remarkable variety of asparagus on the steppes of Akhal-Tekiz. It has not been botanically identified, but it is represented as growing perfectly wild, the stalks being nearly as thick as a man's arm and attaining a height of five or six feet, so that one of them is said to suffice ten Russian soldiers for a meal. If the preference of experts for wild asparagus finds justification in this variety—and its flavor is described as equal to that of the best European kinds—asparagus lovers may have a good time before them.

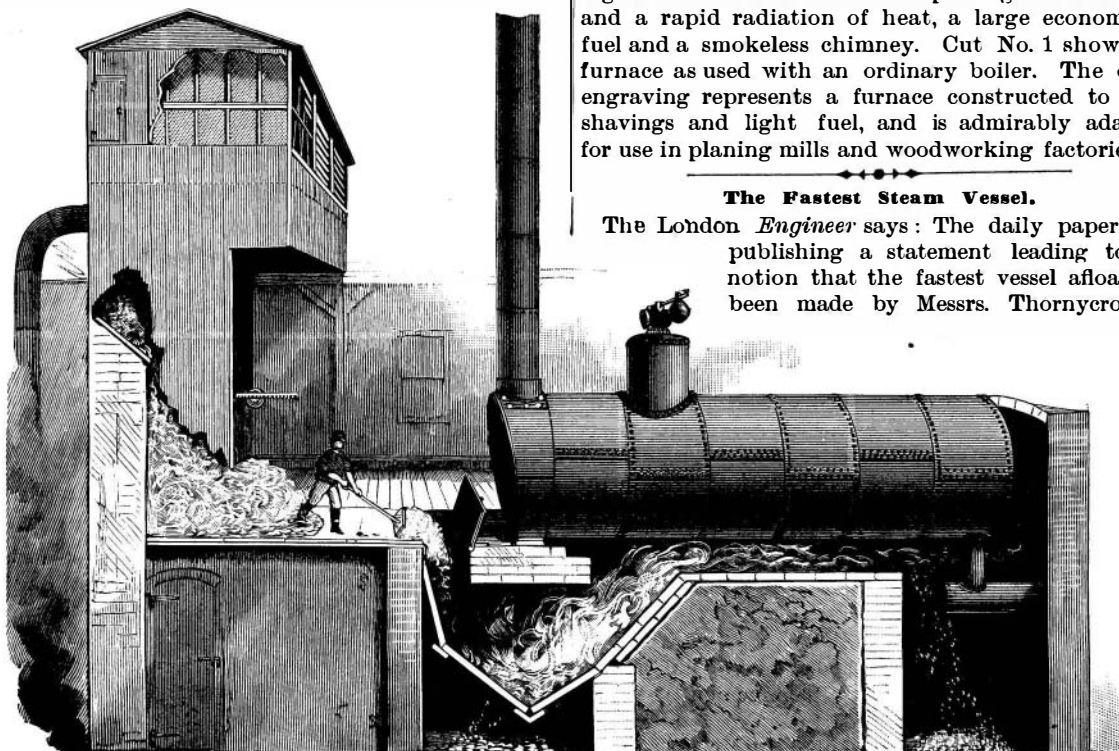


Fig. 2.—SMOKELESS FURNACE FOR SHAVINGS AND LIGHT FUEL.