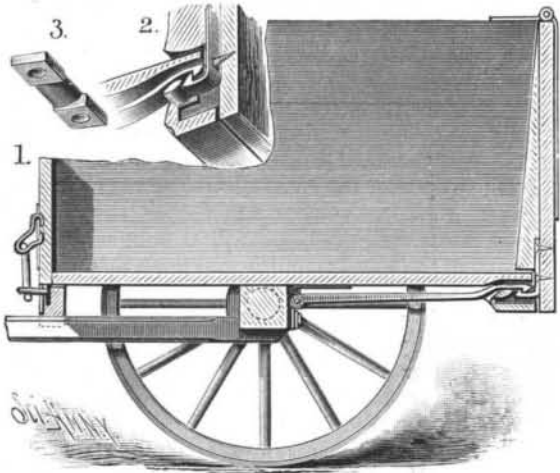


AN IMPROVED DUMP CART.

A cart so constructed that the tail gate may be automatically opened, or shut and locked, by inclining the body from the front or bringing it to a horizontal position, is illustrated herewith, and has been patented by Mr. John G. Frogner. Fig. 1 shows a central longitudinal vertical section of a cart so constructed, Fig. 2 being an enlarged view of the rear section. The tail gate, hinged at the top, completely covers the end of the body, and also the face of a transverse strip attached to the body on the under side, flush with the end. The strip has a central slot registering with a similar slot in the bottom of the wagon body, and between the body bottom and the transverse strip is fixed a metal bridge plate with a central reduced beveled portion, as shown in Fig. 3. This plate is adapted to



FROGNER'S DUMP CART.

span the registering slots. To the center of the rear face of the axle a plate is adjustably secured, by a screw bolt and washer, and to the upper end of this plate a rod is hinged extending to the rear and into the recess to a bearing upon the bridge plate, the rod having at its extremity a hook facing downward. Upon the inner face of the tail gate is a vertical central wedge-shaped brace, its base resting upon the bottom of the cart when the tail gate is closed, and behind this brace, at the base, the shank of a hook is attached to the inner face of the tail gate. When the cart body is held horizontally the gate automatically closes, and the hook upon the gate engages the hook upon the rod hinged to the plate upon the axle. When the front of the body is raised so as to carry it at an angle to the axle, the offset portion of the hinged rod passes over the bridge plate, whereby the hooks are disengaged and the tail gate is automatically opened.

For further information relative to this patent address Messrs. J. & C. Wipf, Iola, Wis.

THE TRANSPORTATION OF WAR VESSELS BY RAILWAY.

It is of the greatest importance to the navy to be able to transport ships rapidly from one port to another. The distance by sea from Toulon to Cherbourg is very great, especially for small vessels like torpedo boats, which cannot easily withstand heavy seas and would run the risk of finding ports closed against them. At first it was proposed to shorten the route by making use of canals. This expedient was tried two years ago, and was voted a failure. It was necessary to dismantle a torpedo boat to such an extent that on arriving at its destination it had to be put on the stocks. The great diameter of the propellers of torpedo boats rendered it necessary to locate the shaft in the keel; and to protect the propeller, and sustain the rudder, it was necessary to terminate the stern post with a stock which extended far beyond the keel.

That the boat might pass through the canals it was necessary to remove this, which, when remounted, was never as solid as when it was in one piece with the stern post.

Furthermore, the passage of the boat interrupted the traffic on the canal, and some of the locks were not sufficiently long to admit of the passage of the vessel. In a word, the disadvantages were

so many that it became necessary to abandon this system of transit.

Railroad transportation naturally suggested itself. The question was made a study by a member of the engineering corps of bridges and highways, and the minister of the navy decided to make the experiment on the proposition as submitted to him, and ordered the work to be commenced for making the experiment.

The making of the trucks designed by the projector was carried out by the engineers of the Company of Creusot, and the trial was entirely successful.

The vessel, placed, like enormous trunks of trees, on cradles on two trucks, projected 44 feet beyond the same in front and 33 feet behind. There was some fear that the weight of the sections which overhung without support would cause damage to a hull whose thickness was only 3 millimeters. There was no indication, however, of any such result. The vessel arrived at the end of its journey of 847 miles between Toulon and Cherbourg in a perfect condition. The trial proved: 1st, that vessels larger than that experimented with could be transported on railways; 2d, that a torpedo boat could be docked at Toulon and could leave by train 24 hours afterward, arriving at Cherbourg in four days and three nights, and could be ready for service 24 hours afterward.

Torpedo boat No. 71 was the one selected for trial. It weighed 38 tons without its supply of water and coal and without its equipment and baggage. It is 111 feet long, 11 feet in width, and 9 feet in height. All parts that were not integral with it were removed and placed in cars.

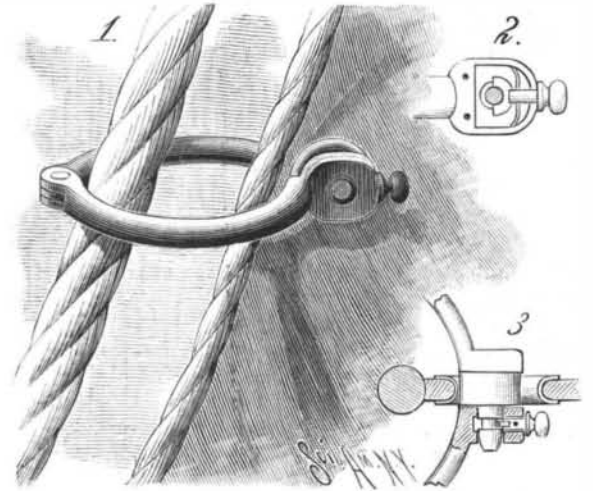
The vessel was lifted out of the water by a hydraulic crane of 160 tons, and placed on two trucks that were provided with two movable cradles that were mounted so as to turn on a central pivot. These trucks have three axles, about seven feet apart, and the end axle has the Recour bearing, which enables it to turn, and facilitates it in making a curve of 375 feet radius.

The body bolster consists of a frame secured to the body of the truck by a main bolt, and rests on four spherical bearings, which in turn rest on guides. The sleepers possess sufficient play to enable the frame to rotate sufficiently on the main bolt to round the smallest curves on the road. The two trucks are placed next one another in close connection, so that the distance between the pivots does not exceed 27 feet. The weight of the vessel, and the fact that the keel remains parallel with a line passing through the centers of the two trucks, the point of the vessel corresponding with the middle of the line, departs necessarily from the axis of the road. It is necessary, therefore, to reduce the distance between the trucks to facilitate the passage of bridges and tunnels. The height of the vessel is limited by the lowness of the bridges. To lower the cradles as much as possible, the two supports are sunk between the wheels.

The stock at the end of the stern post juts out nearly 3 feet beyond the keel, and requires a special car, which allows the freedom of movement required by the

rounding of the curves. The space between the side of the car and the hull of a vessel of 111 feet is sufficient to allow a longitudinal play of about 2 feet, which allows for the action of the connecting links and buffers, and a lateral play sufficient for a curve of 375 feet radius. A long link keeps the last truck at a distance of 12 feet.

The boat occupies the space of about five cars of ordinary size. In front of the cars of special construction are two cars without sides. In one of the first cars were one of the engineers of bridges and highways and Mr. Baehme, commander of the torpedo boat, who observed and were prepared for anything unexpected that might occur. In front and behind the boat were cars carrying the accessories. The train made about 16



JAMESON'S JIB HANK.

miles an hour, a speed which was increased for the sake of experiment to 24 miles.

The expense of preparing the wagons amounted to 32,000 francs, being 13,000 for the two wagons carrying the cradles, and 6,000 francs for the special car. The railroad company charged 0 fr. 25 cent. per ton for transportation, and the weight being 40 tons made the total expense of transit from Toulon to Cherbourg 13,650 francs. The price was high because of its being a special train, and a long, indivisible one. This expense could be considerably reduced by making special rates. Three or four torpedo boats could be transported in one train without exceeding the regulation length of train, or two trains could follow one another ten minutes apart.

In case of war with England, for example, and it was necessary to transport torpedo boats from Toulon to Cherbourg, the expense for material would not exceed 300,000 francs, and the transportation would be within 80,000 francs.

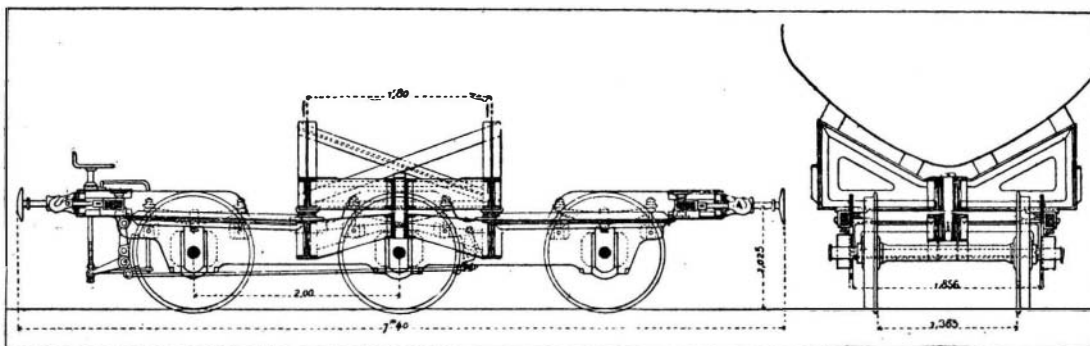
These expenses are very light, and especially so when it is remembered that the expense for material would not be necessary after the first trip, and that the other advantages are very great.

At the request of the ministry, the railroad companies ought to establish favorable rates and decide the maximum size of vessels that would be received. The trial was a complete success, thanks to the wisdom and ability of the engineers who made a study of the problem. There is no doubt that the navy will take advantage of the results of the experiment. —*La Nature*.

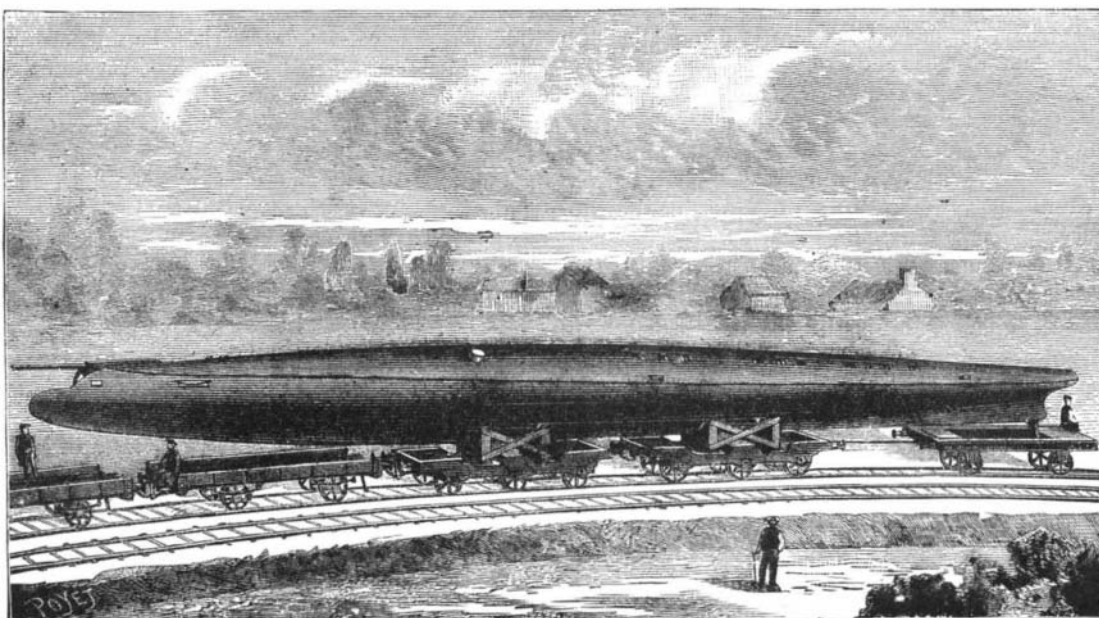
AN IMPROVED JIB HANK.

A device to facilitate attaching and detaching jibs to and from their stays, and which is simply made, conveniently applied, and reliable in use, is illustrated herewith, and has been patented by Mr. Thomas O'Rourke Jameson, of No. 414 Smith Street, South Brooklyn, N. Y.

The hank is made in two semi-annular parts, hinged to each other at one end in such a way that the hinged part will have a smooth inner surface to slide along the stay. Upon the free ends of the hank sections are disks designed to cover the eyelets in the sail, and integral with one of the disks is a pin which passes through the sail eye and into an aperture in the opposing disk. The pin has an annular shoulder to limit the approach of the contiguous faces of the disks to the eyelets, and an annular



RAILWAY TRUCK FOR TRANSPORTING WAR VESSELS.



TRANSPORTATION OF WAR VESSELS BY RAILWAY IN FRANCE.

groove near its reduced outer end, the disk receiving the end of the pin having a central recess, within which is a dog held by a shank passing out from the disk and having a knob, as shown in section in Figs. 2 and 3.

A spring bearing against the end walls of the recess retains the dog in position. The hank having been passed around the stay, and the pin entered the aperture of the second disk, the spring-actuated dog drops into the pin groove and constitutes a lock, the fastening being readily released by pulling on the knob.

AN IMPROVED SAFE-TY CAR HEATER.

A car-heating furnace, surrounded by a water tank mounted on wheels and adapted to revolve around the heater, is illustrated herewith, and has been patented by Mr. Robert B. Cuthbert, of Ten Mile Hill, S. C. The

heater has the usual fireplace, ash pit, and door, and is mounted on a circular base, in the outside of which, on suitable brackets, are mounted wheels which support a tank surrounding the heater, with the exception of the front, the tank being filled with water or other fire-extinguishing fluid. To the upper end of the tank are secured upwardly and inwardly bent pipes, opening at their free ends into the top opening of the heater, and on the top is a dome-shaped shell with a smoke outlet, the interior of the top being protected by a spherical fire guard or deflector, preventing the smoke from passing directly upward, but causing it to travel under the lower edges of the deflector, and thence to the outer opening at the top. When the car meets with an accident whereby the heater and tank are upset, the fire-extinguishing fluid will flow by the pipes into the fire-box or on the burning fuel that may escape.

AN IMPROVED GATE.

A firmly constructed and in expensive gate, designed principally for use with fences for lands, and which is so made that any tendency to sag can always be readily corrected, is shown in the accompanying illustration, and is covered by two patents granted to Mr. John B. Holton, of Washington, Ky. Between the uprights are stretched a series of longitudinally ranging stay rods, which have heads at one end and screw-threaded bolt ends and nuts at the other end, these rods passing through a diagonal brace of the gate, and also through a vertically ranging metal stay bar. The tops of the uprights, which project above the top rail, are connected by a truss rod, which passes through a hole or slot in the top of an angular metal plate held to the top gate rail partly by the same bolt which holds the diagonal brace to this rail. This angular plate is also held firmly by a nut which locks thereon the end of the vertical stay bar. A brace rod also extends from the hinge upright to the diagonal brace, and has adjusted nuts on its rear end. With this construction there is very little liability of disjuncting the gate, either laterally or vertically, and the tendency of the gate to sag is reduced to a minimum. Fig. 2 shows the gate frame, from which the longitudinal stay rods and the base board are omitted, and also illustrates the construction

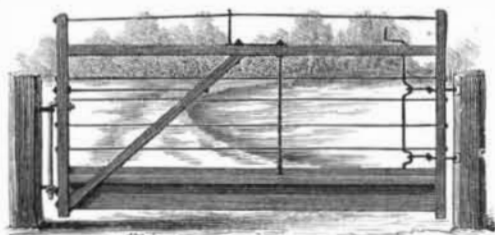
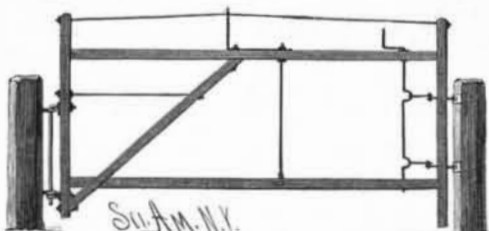


FIG. 1.



HOLTON'S GATE.

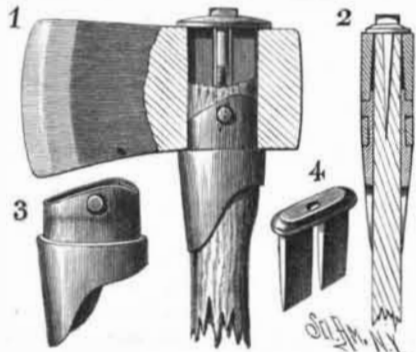
and application of the hinge and latch. The hinge is a right-angular rod, with its longer arm passing down through two open eye bolts set in vertical alignment in the post, and its shorter arm passing through the hinge

upright of the gate. This shorter arm of the hinge, being screw-threaded, combines with a screw plate thereon, which in position rests against the outer face of the upright, and through its upper end, just above the hinge rod, passes the brace rod of the gate. A nut is screwed on the end of the short arm of the hinge, which projects through the upright. The lower end of the long arm of the hinge rod enters the eye of a screw-threaded eye bolt, which passes through the hinge upright, and has two nuts applied to it on the respective sides of said upright. Any tendency of the gate to sag can always be readily corrected by the adjustment of the nuts on this bolt, and also by adjustment of the screw-plate and nut on the horizontal or shorter arm of the hinge rod, and the adjustment of the nuts on the outer end of the brace rod. The gate latch comprises a couple of bolts fitted to slide horizontally, within metal cups or bushings, in the outer upright, the bolts having springs to force them outward, and their inner ends being connected by links or chains with cranks formed as bends of a latch-operating bar journaled to the top and bottom rails of the gate. A double-inclined catch plate is fixed by bolts or screws to the latch post.

AN IMPROVEMENT IN ATTACHING AX HELVES.

An invention providing means whereby the helve may be quickly and readily attached to and detached from an ax, and the ax be greatly strengthened, is illustrated herewith, and has been patented by Mr. Calvin Maloney, of Lower Lake, Lake County, Cal.

The ax is made with aligning apertures in its sides, from the eye, as shown in Fig. 1, and a socket of malleable iron, with shoulder and lugs, is adapted to be fitted therein, as shown in Figs. 2 and 3. The helve is



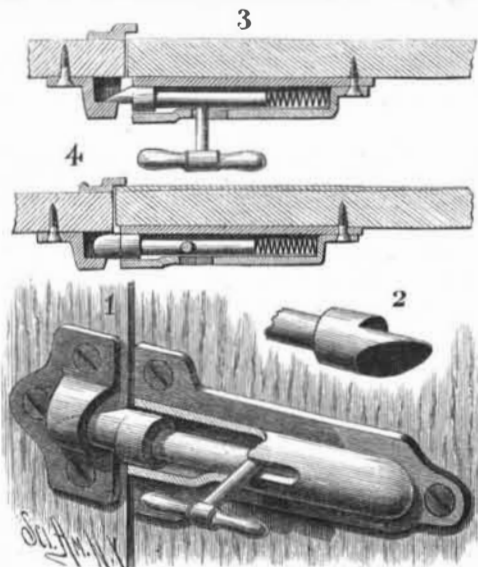
MALONEY'S AX.

then inserted in the eye in the ordinary manner, the outer portion of the socket encircling the helve immediately below the ax, at the weakest point.

In a vertical wedge-shaped slot at the top of the helve is inserted a centrally divided wedge, Fig. 4, and into a central aperture of this wedge is passed a screw, whereby the wedge is firmly fixed to hold the ax upon the helve, and by unscrewing which the wedge may be readily taken out and the ax detached from its helve.

AN IMPROVED DOOR BOLT.

A door bolt especially applicable to refrigerator, ice-house, and similar doors, where it is desirable to close the doors very tightly, is shown herewith, and has been patented by Mr. Frank T. Cladek, of Rahway, N. J. The casing holds a coiled spring to constantly press the bolt forward, the handle of which projects through an opening with side notches to permit the turning of the handle up or down, for locking the bolt in the keeper, and for turning the head of the bolt, shown in

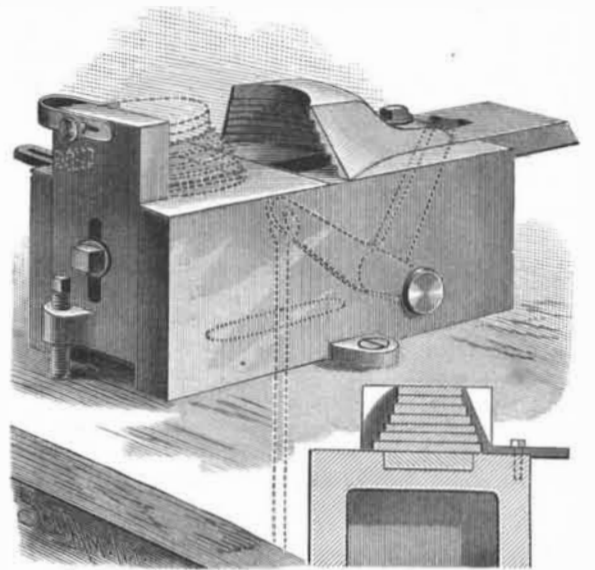


CLADEK'S DOOR BOLT.

Fig. 2, so that it will exert a cam action in the keeper for closing the door tightly. When the handle stands at right angles to the door, as shown in Figs. 1 and 3, the flat surface on one side of the extremity of the bolt will face outward, and in this position will hold the door and door frame flush with each other; but when the handle is turned up or down, as shown in Fig. 4, the cylindrical portion of the bolt will press the door inward tightly against the door jamb.

A MACHINE FOR FORMING BOOT OR SHOE HEELS.

A machine with which a boot or shoe heel may be quickly built to nearly the desired shape, and which is designed to be operated by an inexperienced workman, is represented in the accompanying illustration, and has been patented by Mr. Edgar Jones, of No. 383 Hamilton Street, Albany, N. Y. A perpendicular plate slides vertically in a groove in one end of the base, the

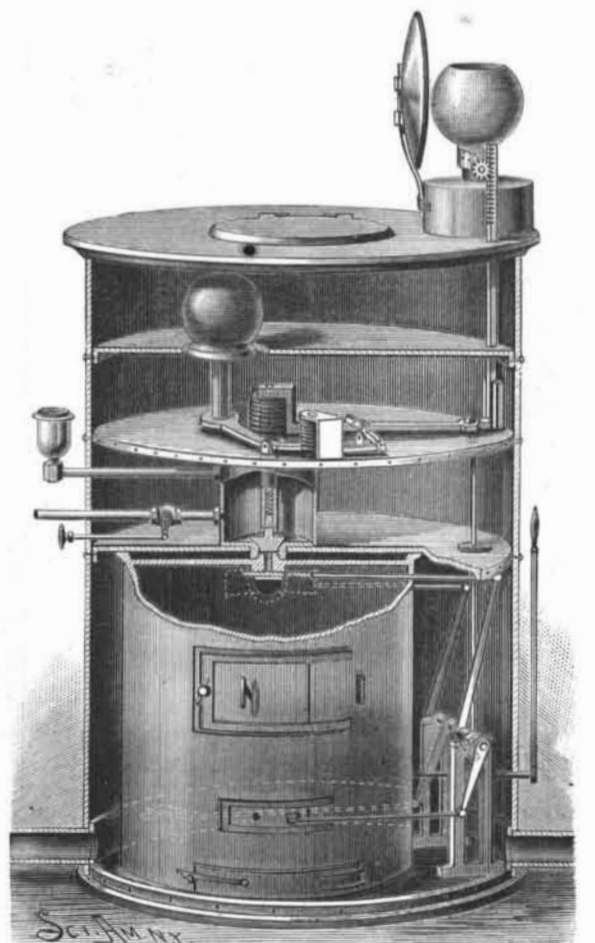


JONES' BOOT OR SHOE HEEL FORMER.

plate being adjustable by a screw at such height as desired, a gauge being attached to one edge of this end sliding plate to constitute a guide for the upper lifts, and another gauge being provided in the upper surface of the table as a guide in placing the lower lifts. Each gauge is slotted and held by a set screw to be readily adjustable to different sized lifts. In ways upon the upper longitudinal edges of the base slides a plate adapted to carry upon its forward part a die or former, the plate being moved forward by a treadle, and a separate die or former being used for different styles of heels. The lifts are placed in position one upon another, as shown in dotted lines, their front surfaces bearing against the end plate, when the die or former is brought firmly against them and the several lifts held in a fixed position until they are nailed.

AN IMPROVED FIREPROOF CAR HEATER.

A car heater which is designed, in case of accident, to extinguish the fire in the heater and the lights in the car, to shut off draught and prevent the escape of smoke and hot air, is illustrated herewith, and has been patented by Mr. Jerod Tyler, of St. Mary's, Pa. The casing is made of strong boiler iron, in which the furnace is braced with light curved braces, which, with the transverse plates, are designed to give the heater fully the strength of a locomotive boiler. The casing has three horizontal partitions, besides the top plate, and the partition which rests on the top of the heater proper supports a fuel-extinguishing device, with a vessel to contain an extinguishing fluid, and



TYLER'S CAR HEATER.