

FITTING TOGETHER PARTS OF STOVES.

An invention to facilitate the fitting together of parts of stoves, as the several pieces are assembled from the different departments of the foundry and finishing shop, has been patented by Messrs. William Carroll and Charles A. Hill, and is illustrated herewith. It consists of a table mounted to revolve on and be locked to a disk adapted to be raised or lowered, Fig. 2 being an inverted plan view of the table, Fig. 3 showing a modified form thereof, Fig. 4 illustrating a device for supporting the doors of the stove, while Fig. 5 shows one of the clamps. The table has a series of openings through which are passed the bolts and stay rods for securing the sides, ends, and top of the stove together, and in the middle of the table is a downwardly extending projection or hub, with an annular groove fitting on the top of a disk held on the upper end of a screw whose lower end is held in a nut in the floor. The double clamp, for holding the stove doors in place while fitting on the pintles, handles, etc., has a sleeve, in each end of which is held a rod on which operates a spring, the outer end of the rod having a handle and toothed jaw, one jaw fitting over a door of the stove, the sleeve passing crosswise over the stove, and the other jaw pressing against the opposite side. The form of table shown in Fig. 3 is mainly for small round stoves. The tables can easily be raised or lowered to suit the convenience of the workman, are free to revolve so that the workman can conveniently get at all sides of the stove without changing his position, or can be fixed at any desired point.

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A STEAM TRICYCLE.

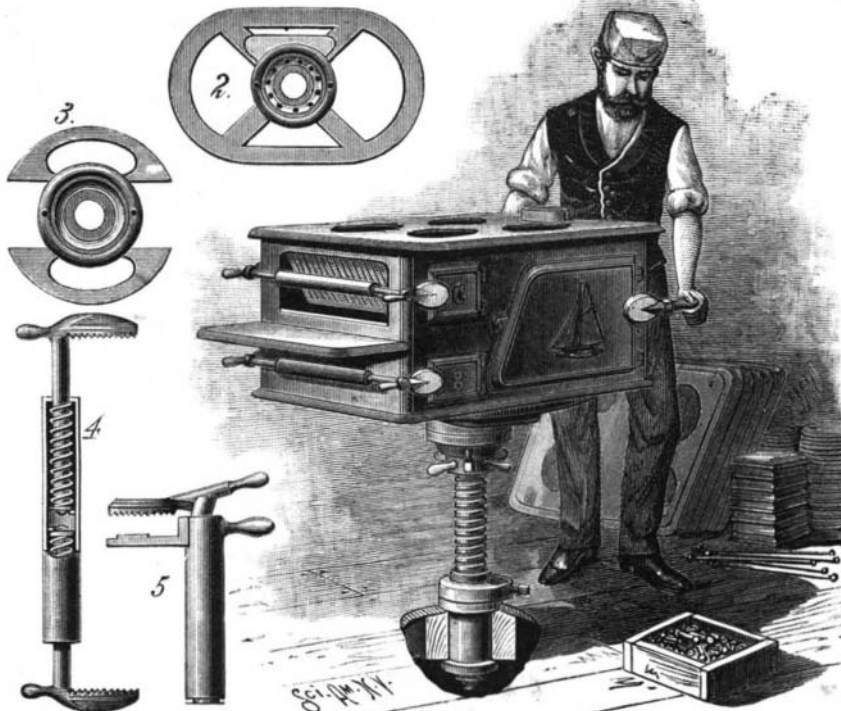
For several years the problem of steam locomotion on ordinary roads has entered a new sphere. Instead of the heavy and cumbersome traction or road engines which are without speed, and are used principally for moving merchandise, small "automotive" vehicles have been substituted, which, being lighter and of greater speed, may be used for the transportation of travelers and for pleasure journeys. The steam tricycle of Messrs. Dion, Bouton & Trepardoux belongs to this class.

By the use of a small steam boiler of their invention, Messrs. Dion, Bouton & Trepardoux obtain a speed of 25 miles an hour, and at the same time have kept to a very high standard the lightness and size of their machine. Their first carriage was constructed simply by way of experiment. The inventors have, however, been perfecting their model, and have made it a practical machine for the purpose for which it was intended. They have constructed machines of several different models, such as phaeton, cart, delivery wagon, and, more recently, tricycles with one and two seats.

The one we illustrate has a single seat and a detachable single-seated car. It is a tricycle with the ordinary steel wire wheels with India rubber fellies. It is steered by the two front wheels, which are 30 inches in diameter. The back wheel is the driving wheel. It is 23 inches in diameter. On the carriage, and between the wheels, is placed a small steam boiler, which holds 5 quarts of water, and in front of this the water reservoir, which holds 9 gallons. At the rear at each side of the driving wheel are the cylindrical fuel boxes. The bicyclist is seated on a seat mounted on springs over the driving wheel. His left hand rests on the steam valve and his right on the steering device. All the parts which it is necessary to operate while the machine is in motion are within easy reach. The brake, which is very powerful and which is operated by the foot, bears against the driving wheel and stops the motion of the vehicle very quickly.

The steam cylinder is located directly under the foot rest of the operator. The piston rod, by means of a double crank, actuates the driving wheel directly without the intermediary of chains or cog wheels. The boiler, which is of sheet steel, is welded, not riveted, and has been tested to a pressure of 44 pounds. It is guaranteed for a pressure of 26 pounds. It can convert 31 quarts of water an hour, and under these conditions develops a capacity of one horse power. It

has a whistle and various other appliances not necessary to mention. The boiler is fed by a pump which is driven by the piston rod. The escape steam from the cylinder passes into the chimney, which is located horizontally, so that there is no draught except when the machine is in motion, which enables the machine to be left from the moment it is stopped, without danger of the pressure increasing beyond the normal limit. Coke is the fuel preferred, and it gives out no smoke. After the kindling wood has been lighted, the fuel is thrown into a central tube, when it feeds automatically into the fire box, as the coke is consumed. This ar-



CARROLL & HILL'S STOVE BLOCK.

angement, which suggests the system employed in the Choubersky stove, enables one to travel for three-quarters of an hour without coaling up.

The tricycle of Messrs. Dion, Bouton & Trepardoux is very easily managed. It is not necessary to have a man specially for getting up steam and running the machine. It only requires a short apprenticeship to run it without any danger. One precaution to be observed is not to acquire too high speed until the direction to be taken is definitely settled. An amateur with even a little experience on a good road can easily make 18 to 20 miles an hour.

This little machine can go up hill very easily. It can make a grade of 1 in 20 at a rate of 6 miles an hour, with the car carrying a load of 175 pounds, and without the car it can mount a grade of 10 in 100.

I constructed a machine of this description, and I have been using it now for six months, and have traveled over several hundred miles with it to my entire satisfaction.

It is very amusing to drive this little locomotive,



NEW FRENCH STEAM TRICYCLE. (From a photograph by the author.)

which obeys with the greatest readiness every whim of the conductor. If the rider objects to riding alone, he is able to take a traveling companion with him in the car. In conclusion it may be said that the tricycle of Messrs. Dion, Bouton & Trepardoux is one of the most successful and practical road engines that has yet been built.—*Vicomte de la Tour-du-Pin-Verclause, in La Nature.*

GROUND coffee digested in cod-liver oil quite overcomes the fishy taste of the latter.

How Paints are Obtained.

Every quarter of the globe is ransacked for the materials—animal, vegetable, and mineral—employed in the manufacture of the colors one finds in a paint box. From the cochineal insects are obtained the gorgeous carmines, as well as the crimson, scarlet, and purple lakes. Sepia is the inky fluid discharged by the cuttlefish, to render the water opaque for its own concealment when attacked. Ivory black and bone black are made out of ivory chips. The exquisite Prussian blue is got by fusing horses' hoofs and other refuse animal matter with impure potassium carbonate. It was discovered by an accident. In the vegetable kingdom are included the lakes, derived from roots, barks, and gums. Blue black is from the charcoal of the vine stalk. Lamp black is soot from certain resinous substances. From the madder plant, which grows in Hindostan, is manufactured turkey red. Gamboge comes from the yellow sap of a tree, which the natives of Siam catch in cocoanut shells. Raw sienna is the natural earth from the neighborhood of Sienna, Italy. When burned, it is burned sienna. Raw umber is an earth from Umbria, and is also burned. To these vegetable pigments may probably be added Indian ink, which is said to be made from burnt camphor. The Chinese, who alone can produce it, will not reveal the secret of its composition. Mastic, the base of the varnish so called, is from the gum of the mastic tree, indigenous to the Grecian archipelago. Bister is the soot of wood ashes. Of real ultramarine but little is found in the market. It is obtained from the precious lapis lazuli, and commands a fabulous price. Chinese white is zinc. Scarlet is iodide of mercury, and cinnabar, or native vermillion, is from quick-silver ore.

Luckily for the health of small children, the water colors in the cheap boxes usually bought for them have little or no relation, chemically, to the real pigments they are intended to counterfeit.—*The Argonaut.*

The Storage Battery.

It is gratifying to note the recent progress of storage batteries in this country, which has been the last to yield from a position of skepticism. The various experimenters have steadfastly plodded along, however, and now it really seems as if the storage battery had come to stay. Upon a careful review of the past, in the light of present knowledge, it seems that a great many of the past failures of batteries to stand up to their duty have been caused by want of knowledge as to the proper treatment of them, the safe current limit in charging and discharging. At the present day the storage battery is as reliable as any other form of battery, and has one great advantage, that, once properly set up and started, and thereafter treated as it should be, a well-made accumulator should last almost indefinitely. Most of the troubles of the past have been due,

not to ignorance of how to make the cells, but to a want of knowledge of how to charge and discharge them, causing sulphating, displacement of the plugs, and buckling of the plates, all of which, through the inexperience of the inventors, have seemed fatal and insurmountable objections. To-day, however, their causes are well understood and easily prevented, and the storage battery is fast growing into one of the powerful tentacles of electric science, and will reach thousands of uses and adaptations perhaps as yet unthought of.—*Electric Review.*

Electric Railways.

The *Electrical World*, after investigation, reports that electric railways have so far successfully withstood the

vicissitudes of the very severe winter through which we are passing.

To this the *Railway Review* adds that the success has been as marked on the conduit as on the overhead or trolley systems. During this winter weather these roads are operated up grades and around curves where it is found impossible to use horses. This method of car propulsion is rapidly growing upon us. The experimental stage is passed. Next will come a remodeling to suit crowded thoroughfares. After that we can hope for universal adoption.