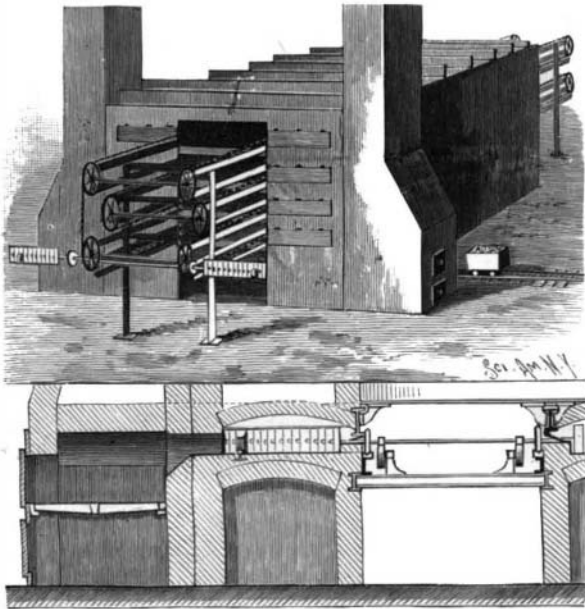


THE WETHEY PARALLEL CALCINING FURNACE.

The improved furnace shown in the accompanying illustration has been patented by Mr. Arthur Harvey Wethey, of Butte, Montana. The object of the invention is to provide a new and improved calcining or desulphurizing furnace for rapidly and thoroughly desulphurizing ores and other material in a ground, crushed, pulverized, or concentrated state, and without loss or waste of material. The furnace consists of two parallel structures set about eight feet apart, and each having four floors or hearths opposite to each other. In the space between the two structures carriages are run which have laterally extending arms



THE WETHEY PARALLEL CALCINING FURNACE.

carrying rakes or plow blades for stirring and moving forward the ore lying in each compartment. The main outside brick walls are braced and strengthened by a stout skeleton structure of channels and I beams which serves to carry the load and bind the whole furnace together. This skeleton frame is one of the excellences of this furnace, as it prevents the sagging and splitting of the brickwork. The outside walls are braced by vertical channel beams, to which are strongly riveted the main horizontal I beams, which pass from outside to outside of the whole structure, and serve to carry the floors. To prevent their getting unduly heated, they are inclosed in airspaces. Upon them are laid a set of longitudinal three inch I beams upon which is placed sheet steel and a layer of brick, forming the floors or hearths. The inside wall of the furnace is divided by a horizontal slot for the passage of the arms of the plow, the lower half of the wall being formed by a channel iron upon which run the wheels of the plow carriages, the upper half being formed of an I beam, which is suspended from the main transverse I beam above, this I beam also carrying the inner footing of the arched roof of the furnace. Swinging doors are provided at the end of each hearth or compartment, so that the plow arms can pass into or out of the furnace as desired. The carriages with their plow arms are drawn across each floor and transferred from one floor to the other by means of a pair of endless chains which pass over sprocket wheels at each end of the furnace. Thus the plow, after passing through the top floor, stirring up and pushing forward the ore, passes out through the end door and over the end sprocket wheel. It then enters the furnace on the second floor, and so on until the lowest floor has been traversed, when it is returned again to the top floor. The above mentioned slot in the inner walls of the furnace is closed by a series of tripping doors, which open and close automatically as the plow passes. At the far end of each hearth is provided an opening through which the ore falls to the hearth below, and as the travel of the plow on each floor is in the reverse direction to that on the floor above, it follows that the ore is slowly pushed forward to the final discharge, where it is caught by the truck shown in the engraving. The heat inlet from the firebox is arranged near the final ore discharge and at the side of the furnace as shown, and the heat travels through the various hearths in a direction contrary to that of the ore, finally passing to the chimney by an outlet situated on the first or upper floor. The ore travels about 200 feet from the point where it enters the furnace to the point where it leaves it.

A New Method for Determining the Melting Point.

In the course of legal analyses, where it became necessary to examine carefully very small quantities of stearin and other candle material upon pieces of clothing, and where the quantity of material was so small that the use of capillary tubes was impossible, Van Leeden-Hulsebosch (Pharm. Weekblad) devised the following method: He laid small pieces of the cloth on which the fat was detected in a small aluminum capsule, and floated this upon water in a large beaker. He then heated this water bath very care-

fully, and suspended in it a thermometer so adjusted that only the upper portion of the water affected the thermometer. Slowly raising the temperature, he kept a close watch on the thermometer and upon the grease under examination, and was thus enabled to determine with considerable accuracy both its melting and congealing points.

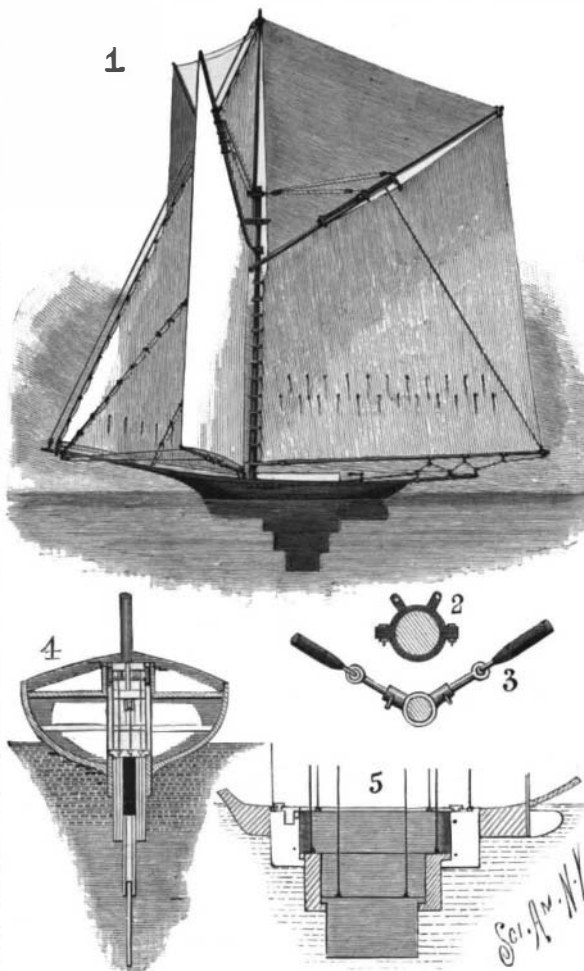
AN IMPROVED SAILING VESSEL.

An improved form of centerboard and new methods in the construction of spars and rigging are shown in the accompanying illustration of a sailing vessel. The various devices have been patented by Mr. William King, of New Orleans, La. By reference to the illustrations it will be seen that the stability of the vessel is increased by providing it with a telescopic centerboard which consists of a main centerboard within which is a double centerboard, an amidship centerboard carried by the double centerboard, and a port and starboard centerboard respectively carried on each side of the double centerboard, and within the main centerboard. When the boards are down to their full depth they are supported by lugs at their ends which engage ledges in the adjoining boards, and they are raised or lowered by cables which are actuated by winches conveniently arranged above the centerboard well. When the vessel is closehauled in a fresh breeze the board is lowered to its full depth as in Figs. 1, 4, and 5. When it is sailing free all the boards are housed within the well. If it is cruising with light sails or with a nearly fair wind, one or both of the port and starboard centerboards may be used. In this way the lateral plane and stability of the vessel may be regulated at will.

The spar plan and sail plan are also formed so that they may be enlarged or decreased at pleasure. This is accomplished by providing the spinnaker booms, and the gaffs of the mainsail and of the spinnakers, with auxiliary spars, sliding within suitable rings or sockets which are fixed near the ends of said gaffs and booms. These spars are adjusted by means of halyards and blocks, and can be reefed home or run out as desired, and a larger or smaller amount of canvas carried. Two spinnakers are used, and the booms are pivotally mounted on suitable steps which are placed one on each bow of the vessel. The spinnakers are not hoisted to the topmast as is usually done, but are provided with extensible gaffs, the heels of the gaffs being pivotally connected with a band, which is clamped upon the mast, as shown in Figs. 2 and 3. This connection has a universal pivotal movement. Should the topmast be carried away, one of the gaffs could be swung up into position and used in its place. These gaffs are hung from the topmast by the customary halyards and blocks.

The spinnaker booms are sheeted forward to the bowsprit end and aft to the outrigger as shown, and when they are not in use they rest in crutches at the end of the bowsprit.

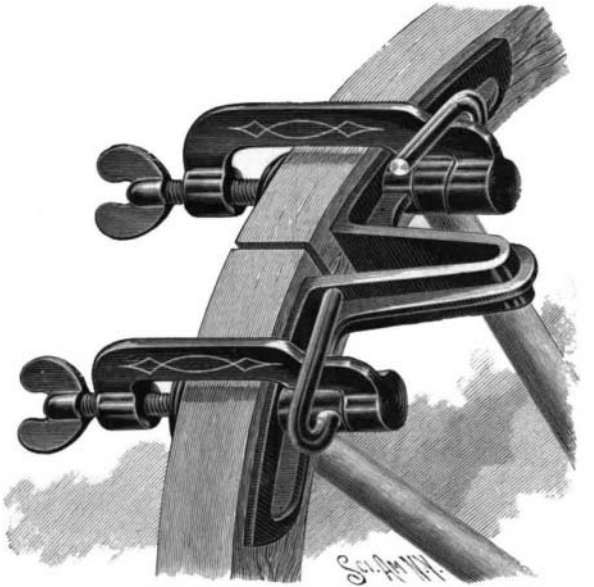
By the use of the two separate spinnakers the handling of the sails when running before the wind is simplified, and the dangerous operation of "gybing" is avoided. A stout outrigger is provided at the stern upon which the blocks of the main sheet are fastened, the long boom being greatly stiffened thereby.



AN IMPROVED SAILING VESSEL.

A RIM CLAMP FOR WHEELS.

An improved clamp for use in the manufacture of the rims or fellos of wheels, which has been patented by Mr. Charles Schalles, of Cortez, Colorado, is shown in the accompanying illustration. It consists of a body bar, which is T shaped in section, and is provided at the middle of its length with a deep, laterally extending arch. On each side of the arch a bearing surface is formed, which is provided with a hole to receive a sliding spindle or pin. Associated with the body bar are two clamps or yokes, at one end of which are provided adjusting screws, which terminate in flat swiveling heads or bearing plates. The outer end of the yoke carries a spindle, which projects



A RIM CLAMP FOR WHEELS.

inwardly and lies in the same axis as the above-mentioned adjusting screws. Upon this spindle is arranged a lock lever, and the adjacent faces of the lever and the clamping yoke are formed spirally, so that when the lever is thrown over across the yoke, as seen in the illustration, it will cause the lock to travel in the direction of the adjustment screws, and so exercise a clamping action upon the bearing surfaces of the body bar. In applying the clamp the lock levers are thrown back and the body bar is placed across the joint so that the abutting ends of the rim will be directly opposite the laterally extending arch. The bearing plates are brought snugly up against the opposite side of the rim, and the clamp is then tightened by turning the cam levers into the position shown in the cut. By this device the abutting ends of the rim sections may be accurately trimmed with a saw, for being rigidly held in position they cannot twist and bind the saw. The invention is also capable of attachment to wheels of different widths, and it provides a means for locking the clamps independently, so that one section may be loosened and allowed to assume its proper position relative to the clamped section, thus facilitating inspection of the joint.

The Appellate Justices Decide Against the Broadway Tunnel Scheme.

The question of rapid transit for New York City has taken one step forward, or backward, according as the citizens may individually regard the recent ruling of the justices of the Appellate Division of the Supreme Court against the proposed tunnel beneath Broadway, New York. The Broadway scheme as submitted by the Rapid Transit Commission and indorsed by the Supreme Court Commission is vetoed with unusual emphasis, and the decision is one from which there is no appeal. The ruling states that "the most serious question is that of cost," and it dwells upon the fact that "after all the investigation which the Court Commissioners made upon the subject, they were entirely unable to come to any conclusion as to the probable expense;" and it points out that the cost of construction in any case would pass the city's debt limit.

The public will now turn naturally to the late proposition of the elevated roads as affording the only immediate prospect for enlarged transit facilities. It is the intention of Mayor Strong to submit the proposals of Messrs. Gould and Sage for an extension and enlargement of the facilities of these roads to the Rapid Transit Commission, and it is to be hoped that the scheme will be indorsed and pushed through to completion at an early date. It would appear to be the general sentiment that an underground system of transit is only to be regarded in any case as a "dernier ressort," but while the sentiment is reasonable and strong, we think that the statistics of the city's growth give reason to believe that we shall be driven to this extremity sooner than is generally supposed.

Two trees, 125 feet from each other, at Gainesville, Ga., were recently struck and shattered by a single bolt of lightning.