## METALLURGIC FURNACE.

Our engraving sbows a furnace recently patented by Mr. T. J. Wilson, of 87 Wall Street, Auburn, N. Y., which is designed for beating or rebeating blanks. In the left of the cut is sbown the furnace, in which coal may be burned on a grate, or a gas burner mily be substituted. The bot blast apparatus cousists of a fan and the coil of beating pipe, $a$, which is arranged in the flue to be beated by the beat of the furnace passivg along it, and which bas a discharge pipe passing outside of the wall of the flue and discharging into a bollow bridge wall between the furnace and the flue, to be furtber heated, and also to protect the bridge wall from beat. From the lower part of the bridge wall the bot air escape From the lo through a small slot orifice into the lower part of the fur-
nace. Outside of the furnace wall the pipe is provided with nace. Outside of the furnace wall the $p$
a valve for regulating the supply of air.


WILSON'S METALLURGIC FURNACE gases for fuel, there is arranged a superbeating coil of fire grooved pulley and thence to a weight which acts to kee clay (called by the inventor a "decomposer"), consisting of a series of borizontal communicating flues, c. This coil is placed next to the cbimney and is in a fire clay lined metallic case, which bas an exterior protecting jacket of similar material. The decomposer is arranged in the center of the flue, so that it will be acted on at both sides and ends by the beat passing along the flue.
The steam enters the decomposer by the pipe shown beside the cbimney, and which is connected with the boiler and is furnished with a valve for regulating the supply. In the pipe, $b$, are two other valves, one where the superbeated steam leaves the decomposer and the other near where th pipe enters the furnace chamber. By the first mentioned valve the steam may be re tained in the decomposer until properly de composed, and by the other the supply to the furnace may be governed. The steam is discbarged into the furuace through numerous jet orifices of a pipe extending from side to side.
Here the oxygen of the steam, uniting with the carbon of the incandescent coal, forms carbonic oxide, leaving the bydrogen free to burn with great intensity in combina tion with the oxygen of the incoming bot blast. The carbonic oxide, at the same time taking up additional oxygen from the bot blast, burns with great intensity. These changes produce greater beat than the coal alone is capable of. The bianks to be beated are inserted througb openings in the chamber above the fire bed. For discharging the ashes without wasting the whole of the fire bed, a temporary grate consisting of bars is shoved in through the front wall and the fire bed into recesses in the bridge wall, whereon the upper portion of the fire will be supported while the rest may be discharged througb the lower grate.

## IMPROVED ELEVATOR.

Our engraving shows an elevator provided with safety appiances which are simple in construction, effective in operation, and which combine cheapness, strength, and du rability. In Fig. 4 is shown a device for stopping the platform in the upward as wel as the downward course, this being neces sary, since some platforms are counterbal anced more than the weight of the empty platform, and are liable to damage by ascend ing rapidly in case they become accidentally disconnected from the motor. In Fig. 1 the device is arranged so as to only prevent the too rapid descent of the platform.

The racks for the ways in which the platform works are made with zigzag side flanges, and cross bars with which catch pawls enand cross bars with which catch pawls en-
gage when safety demands the stopping of the platform; the flanges confine the pawls laterally when thrust in the rack. The pawls are provided with arms that balance them a way from the rack, and have rolls gravitating to contact with the zigzag ways, so that when the speed is not too fast the pawls will not engage the racks. But should the speed overrun the predetermined limit by the breaking of the cbains, so that the thrusts of the projections of the ways would be greater on the rolls, or simply pre-
venting the rolls from following in the bottom of the zigzags, then the pawls would come in contact with the cross bars, thereby bolding the car. The roll arms of those pawls which stop the descent of the platiorm are merely made beavier than the pawls; but those in which the roll arms extenddownward are provided witb counterbalance weights. When the pawls catci on the racks the thrust tends to keep them in contact, so that in case they only catcb slightly at first they will be forced into the bottom of the racks and se curely engaged by the momentum of the platform. The pawls of the opposite sides are connected together by rods and bal ance levers, in order that both may engage the racks simultaneously. The rods are made elastic by means of coils in them, as rigidity might cause breakage in case one pawl should strike on top of a cross bar and the otber in the notch between the bars.
The elevator platform (Fig. 1) is sus pended from cbains that pass over sprocket wheels mounted upon a cross shaft; the chains then pass over pulleys on top of the frame, and thence down to the counterbalance weight. Upon one end of the sbaft is mounted a large grooved wheel, in which runs an endless rope whicb bangs down beside the car within easy reach of the operator. Pivoted to a cross bar near the under side of the wheel is a brake lever, the shoe of which presses against the periphery of the wheel. To the other end of the lever two ropes are attached; one of which passes over attached; one of which passes over


## MASON'S IMPROVED ELEVATOR

## BENDING MACHINE

An invention recently patented by Mr: W. W. Stokes, P. O. Box 160, Anna, Illinois, consists of a device for the use of blacksmiths, carriage makers, and otber iron work ers, for bending stirrup, clip, and other irons by band The bed plate is constructed with tbree parallel slots, and is provided with an anvil block and a gauge bar, both o which are firmly attached; the gauge bar bas a sbifting stop for gauging the distance of the bends from the ends of the


## STOKES' BENDING MACHINE

bars. Alongside of the anvil block is a former block, bav ing one square end and one balf-round end, secured with a bolt, nut, and washer, so as to bind it fast to the bed plate eitber parallel with, or obliquely to, the anvil block.
The washer is constructed with a rib as wide as the slot to prevent it from turning with the nut. Forms of different forms and sizes are employed according to the different forms and sizes of bars and the bends to be made in them. When the nut is removed, a keeper prevents the bolt from dropping out. In the outside slot is fitted a pivot bolt for the fulcrum of the main bending lever, the bolt being ad justable along the slot for locating the lever as desired relatively to the anvil, and baving a sleeve on the part whereon the lever turns for the nut to jam on in secur ing the lever, and also for sustaining the wear. At a short distance from the pivot bolt the lever is recessed in the lower side to receive the forming block (Fig. 2), and a sec ond lever between it and the bed plate, and it is formed with a longitudinal slot for in serting the bolts of the block and of the second lever. The forming block is to be set close to the end of the second lever when the latter is set at a distance from the reces shoulder and is used for bending a bar around the former. This former is more par ticularly employed when a reverse angle is to be made, as indicated in Fig. 4. When the bar is to be bent in the form of a clip (Fig. 1), or into an obtuse angle (Fig. 3), the former is not used.

When the machine is arranged as shown in Fig. 1, the first lever bends the bar around to the end of the former, and then the second lever bends it around to the side of the former for making clips.

## Manganese in Animals and Plants.

Recent researches by M. Maumene bav shown that the metal manganese exists in wheat, rice, and a great variety of vegetables Wheat contains from one five-thousandth to one fifteen-thousandth of 1ts weight of the metal, which exists chiefly as a salt of an or gavic acid. It is also found in potatoes, beetroot, carrots, beans, peas, asparagus, apples, grapes, and so on. The leaves of the young vine are very rich in it; so are the young vine are very rich in it; so are tbe
stones of apricots. The proportion in cacao stones of apricots. The proportion in cacao
is very great, as it is in coffee, tobacco, and especially tea. In the 50 grammes of asbe left by a kilogramme of tea, there was found 5 grains of metallic manganese. There are vegetables, bowever, in whicb no manganes can be found, as, for example, oranges, lem ons, onions, etc. Many medicinal plants con tain it, as, for example, cinchona, white mustard, and the lichen (Rocella tinctoria). Ani mal blond does not always contain it, but it is found in milk, bones, aud even bair M. Maumene regards its presence in th us of a 16-year old inventor, Master Edgar B. Badlam, who buman body as an accident, and not of vital importance bas patented an "improved steam boiler," and is perfecting He also suggests that doctors should cease to employ man other inventions which promise to be of importance. He ganese as a succedaneum for iron, for while the latter is bas a model shop, costing $\$ 2,000$, where be bas turned useful to the blood, the former is an intruder which is only out many models, bis fatber thinking that "this is the kind tolerated in small traces, and rejected in larger quantities. of encouragement the young men of our day should bave keeping them off the streets and making self-supporting men and good citizens."

Tea, coffee, and other vegetables require abundance of man ganese in the soil for their proper cultivation, and the ab sence of it may account for the lailure of many plantations.

