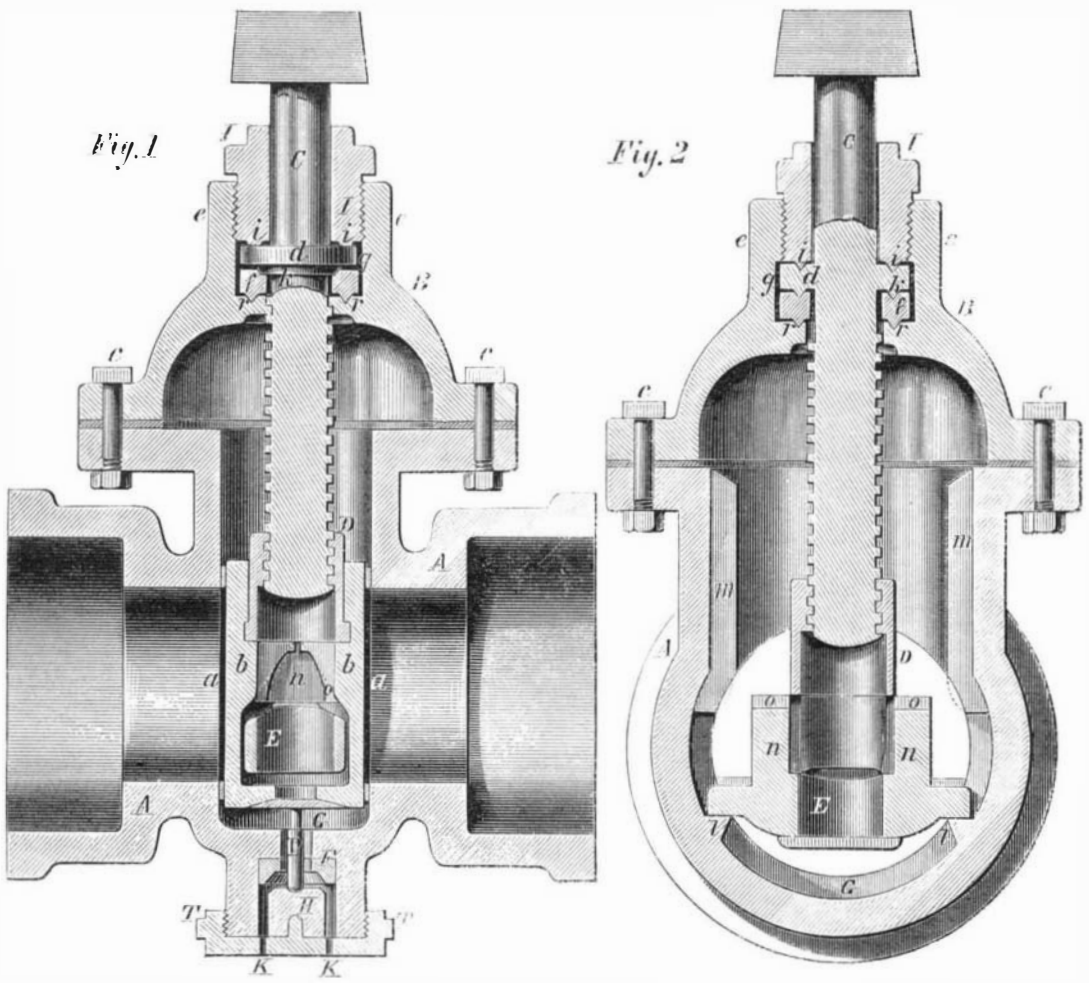
Improved Water Gate.

Our engraving illustrates the construction of an improved water gate, which comprises valuable and new features and to which we call the attention of hydraulic engineers as probably being, for some purposes, superior to others which have preceded it. The water flows through a straight passage, and the construction is such that, with minimum size, a large proportional flow is obtained. The parts are accessible and easy of adjustment, and the whole combination will, we think, commend itself to those competent to judge of such matters. The valve can be used for gas or steam, and has much to recommend it for these purposes. The gate, as will be seen by the description of details below, is easily operated, even under great pressures. The extreme compactness of this gate, its automatic drain, and the peculiarly constructed resting place of the double wedge, whereby an unobstructed recess for sediment is secured, are also features which will impress those of our readers who are familiar with the requirements of a good water gate. The stem packing is remarkable for its compactness, durability, and effectiveness.



PEET'S IMPROVED WATER GATE.

A, Figs. 1 and 2, denotes the shell or case of the valve through which a straight passage for the flow of water or steam is made. Two seats, *a*, Fig. 1, are formed on the internal opposite sides of the passage, against which the two valve disks, *b*, close. B is the bonnet, the flanged base of which is connected with the flanged top of the shell by means of bolts or screws, *c*, passing through the two flanges. C is the stem, which extends down through the neck of the bonnet and carries on its lower end a flanged traversing nut, D, to which the valve disks, *b*, Fig. 1, are affixed. On the stem is an annular collar, *d*, which is disposed within the neck, *e*, of the bonnet and rests upon a brass or metallic washer, *f*, which, in turn, rests upon the bottom of the chamber, *g*, of the neck. I is a screw nut, which screws into the neck and down upon the collar, *d*, serving to prevent any longitudinal movement of the stem, while it allows it to rotate upon its axis. For the purpose of perfectly packing the stem there is formed on the lower surface of the screw, I, a circular V shaped rib, *i*, which fits into a correspondingly formed depression or groove made in the upper surface of the collar, *d*. A similar shaped annulus or rib, *k*, and a corresponding channel are formed respectively on the under surface of the collar and the top surface of the washer, *f*.

Another and similar annular rib, *r*, and fellow groove are formed respectively on the under surface of the washer and the bottom of the chamber, *g*. All the series of annular ribs are ground and so formed that the apices of their angles shall not impinge against the bottom of the grooves, but so made that each shall have two bearing surfaces upon opposite walls thereof, whereby a double protection is afforded at each joint. These ribs being forced down upon their seats by means of the screw, I, with any desirable degree of force, a most perfect steam or water tight connection is insured.

The disks, *b*, are guided in their vertical movements by means of channels, formed respectively on the opposite sides of the disks, operating in conjunction with vertical ribs, *m*, disposed on opposite walls of the shell, as shown in Fig. 2. Each of the disks is connected independently and loosely with the flanged traversing nut, D, and each has two inclined recesses, *o*, Figs. 1 and 2, formed in its inner face to receive two wedges, *n*, disposed near the ends of a wedge-carrying plate, E, through which the stem slides, this plate being stopped in its downward movement by means of projections or lugs, *l*, disposed on the inner surface of the valve shell, as shown in Fig. 2. G is a recess or chamber, formed underneath the disks when at their lowest position, which receives any sediment which may be in the water or which may be removed from the valve seats by the closing of the disks.

The employment of the double wedges is designed for large sized water gates, they being especially useful when the valve plates used are more than a foot in diameter, as a single wedge arranged centrally between the two disks would admit of too great oscillation of the disks while being opened and closed.

The operation of the disks and wedges is as follows:

To close the valve or the disks upon their seats, we have simply to rotate the screw stem in the proper direction. The disks being hung to the traversing nut, D, and carrying the wedge plate and wedges between them, will be forced downward until the projecting ends of the wedge plate strike upon the lugs, when the wedges become stationary and, by their action against the inclines on the inner faces of the disks, the latter will be forced in close contact with their seats. To open the disks, the stem is to be rotated in the opposite direction to that used in closing them. As soon as the disks begin to start, they are instantaneously relieved from their pressure against their seats, so as to produce but little friction or wear of either the disks or their seats. The employment of the two wedges, arranged as described, serves to preserve the disks from too great lateral play under the pressure of the water or steam while being operated.

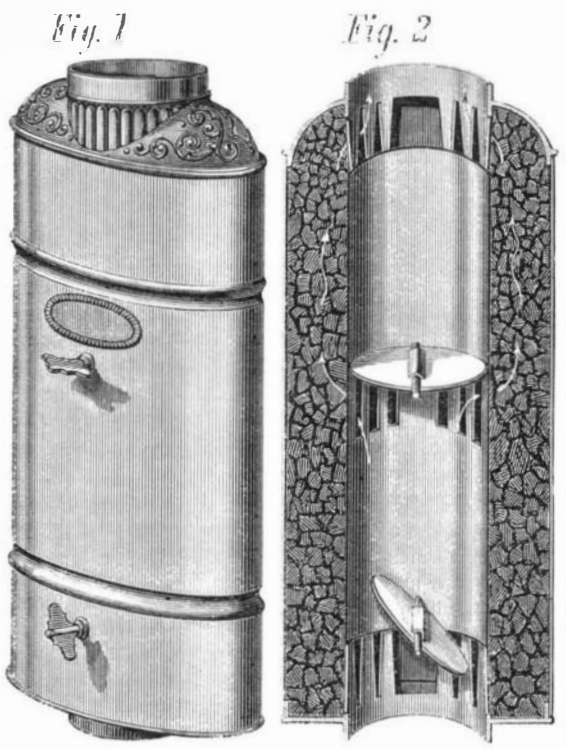
The automatic drain is constructed as follows:

H represents a rubber spring fitted into a boss cast on the bottom of the shell; this spring is enough smaller than the hole in the boss to leave the drain, K. F is a white metal washer with a conical shaped seat fitted to the size and shape of the upper end of the rubber spring. P is an iron pin firmly fitted into the top of the spring; this pin is of sufficient length to reach up three eighths of an inch into the water way when the valve is open or the disks sufficiently raised. This spring is forced into position by means of the screw nut, T.

This invention was patented March 19, 1872, and further information may be had by addressing the Peet Valve Co., 152 Hampden street, Boston, Mass.

TWITCHELL'S DRAFT REGULATOR AND HEAT ECONOMIZER.

The accompanying engraving illustrates an attachment applicable to any kind of stove or range, the object being to



regulate the draft and more fully extract the heat from the gases of combustion than is done by the ordinary dampers in use.

The attachment is neat in design, while, we judge, the principle on which it operates must lead to the desirable results claimed for it. These claims are sustained by a large number of testimonials from those who have used the invention, and who have thereby made a notable reduction in their coal bills.

It is claimed that, while one third or more of the fuel ordinarily used for heating or cooking may be saved, other conveniences, such as the perfect control of the heat and the easy preservation of the fire during the night, etc., are secured by the device, which costs little and requires very little attention to operate it.

Fig. 1 is a perspective view, and Fig. 2, a section of the apparatus. It consists of an external and internal sheet iron case, the annular space between which is filled with some solid material in lumps, hard coal being the handiest and most preferable substance for the purpose. There are two dampers, as shown. When both are open, the gases of combustion escape through the center of the regulator directly to the chimney. When the upper one is closed and the lower one opened, the gases take the direction of the arrows, passing into the annular space through slots in the inner shell and traversing the interstices between the lumps of coal, and are retarded in their course, thus being rendered less sensitive to external winds and currents than would be the case if they passed directly to the chimney. The draft thus produced is steady instead of fitful, and the coal, becoming heated, radiates its heat into the apartment. The radiating surface is large, owing to the fragmentary state of the material, and the extraction of the heat from the gases can be carried to the utmost extent consistent with the continuation of the draft.

The lower damper, when used, lengthens the distance which the gases must traverse through the interstices; and by the proper adjustment of the two, the consumption of fuel is controlled without danger of extinguishing the fire.

Patented Feb. 7, 1871. For further information address S. H. Twitchell, 27 Bedford avenue, Williamsburgh, N. Y.

[See advertisement on another page.]

COMPRESSED AIR LOCOMOTIVES.

In a recent article on the use of compressed air engines, the editor of *Engineering* expresses the opinion that the proper way, to prevent the great reduction of temperature which necessarily attends the expansion of air, through the engine, from its compressed state, is to apply heat to the main reservoir and to the engine cylinders; and that the best way to do this is by means of a jacket supplied with hot water. On a street car, weighing with load six tuns, it is estimated that 318 pounds of hot water would furnish the necessary temperature. It is also estimated that to drive such a car, for a distance of four miles at the rate of eight miles per hour, will require the employment of 170 cubic feet of air, condensed to an initial pressure of 300 pounds to the square inch. This supply of air could be packed into thirty-four wrought iron tubes 10 feet each in length and $9\frac{5}{8}$ inches interior diameter. Such a locomotive would not be an economical method of using power as compared with steam, but might be highly advantageous where steam cannot be used, as, for example, on street railways or city railway tunnels.

Manufacture of American Sewing Machines in Scotland.

The Howe Sewing Machine Company of Glasgow, Scotland, has recently held in that city the first annual social meeting of the employees. Mr. F. M. Tower, the chairman of the meeting, informed the audience that the manufactory in Glasgow was only an offshoot from the American one, which has been in operation for many years. One of the chief motives of the Company in transferring a portion of their production to that country was the conviction that it was needed. Within less than five years the Company's production had increased from 50 to 500 per day. After giving an account of the Company's great works at Bridgeport, Connecticut, and at Peru, in one of the western States, Mr. Tower mentioned that the demands now are for 50,000 machines per annum, and that ground extending to 8,000 or 9,000 square yards has been secured in the east end of Glasgow, on which very extensive works are to be erected forthwith. The Company sell their machines in England at half the price they charge for them here, and still make immense profits. In this country, under the cover of the Wilson and other patent monopolies, they are enabled to charge extortionate rates. It is to be hoped that Congress will refuse to extend the Wilson patent.

It is found, in Canada, that 100 lbs. of peat will last longer than half a cord of wood, for locomotive fuel.