

INCREASED EFFICIENCY OF GRATE FIRES.

"In the time of peace, prepare for war." In the sweltering temperature of summer, the means of keeping cool is a subject rather more congenial than that of warming our homes, though the latter must needs be considered, if only to the extent of laying in the winter's supply of fuel. The modern open grate fire, while undoubtedly one of the pleasantest and most cheerful means of heating, is also the least efficient and economical; and, except in very moderate weather, can be used only as an auxiliary to stoves, hot air furnaces or steam. That the sense of comfort is enhanced by the cheerful, ruddy glow of an open fire, as well as by its warmth, all will agree. There is nothing which gives to a room so cosy and homelike an appearance on a cold winter's night, and we all enjoy the hour between daylight and lamplight, when the flicker of the flames or glow of the embers supply the deficiency. But to those by whom the consideration of economy is a necessity that is, the rank and file of humanity the indulgence of using a grate fire becomes an extravagance. The question is then, need it be? Cannot an economical form of grate be devised which will place it on a par, in this respect, with an improved heating stove?

Sir William Siemens, the great English furnace engineer, did not consider the subject beneath his notice, and his invention of the regenerative gas burning grate was one of his later successes—better known in England, however, than in this country. In this device, the gas and the air necessary to supply the combustion were heated, before ignition, by radiated heat from the fireplace, which would not otherwise have been utilized. The flame gave perfect combustion of the gas and permeated through the interstices of a bed of hard coke, which it rendered incandescent, though from lack of oxygen there was but little combustion of the coke. The flame, though intensely hot, was nearly invisible, and the appearance of the fire was very similar to that of an ordinary coke fire. As the high price of manufactured gas makes its use for this purpose far more costly than coal, the use of the Siemens' grate in this country is necessarily very limited. What is needed is not so much an improvement in the method of producing the heat as in utilizing a larger proportion of that which is generated by the ordinary form of grate combustion, though doubtless the latter is capable of giving much better results by the adaptation of well known furnace principles to the purpose.

The great source of loss which causes so low a degree of efficiency in proportion to the amount of coal burned, is the current of chimney draft from in front of the fire. That this loss is unnecessarily great in the large majority of cases, is due to the lack of any provision for adjusting the size of opening into the chimney, by which the draft might be regulated to suit the condition of the fire, and allow of only so much current as might be found necessary to carry off the smoke and gases resulting from the imperfect combustion of the coal.

As the size of the fixed flue opening must be sufficient for the maximum re-

quirements, as of starting the fire, it is obvious that it is much too great for the average or minimum draft needed. This fact may be demonstrated in a very simple manner by merely choking down the size of chimney opening with fire brick, or, in fact, anything of suitable size and shape, of incombustible material. If the reduction in the size of the opening made, of course, after the fire has burned up smell of smoke or gas in the room, the increase in the amount of heat thrown out into the room is very perceptible, and, as a matter of fact, represents a large percentage of increase in efficiency from the same fuel consumption. The demonstration of this fact, then, leads to the natural deduction that an adjustable flue opening, or, in other words, the provision of a damper, should be considered an essential feature of an open grate fire place. Any one of a hundred simple and inexpensive forms of damper may be used, and their application to existing fire places as well as new ones, is entirely practicable, and will surely pay. There is, however, another method by which a large gain of economy and efficiency may be accomplished, and that is, in a radical change in the form of construction of the fire place, by which the back and side walls may be made to give out a very considerable quantity of heat, in addition to that radiated from the fire. The requirements of such a device would involve the use of an air space entirely surrounding the sides and back, and a means of admitting cold air at the bottom, with an outlet for the heated air at or near the top. The walls would require to be made comparatively thin, and of a material of high thermal conductivity, so that the transmission of heat to the air circulating through the air space would be sufficiently rapid. Of course, the damper in the flue opening to the chimney would be necessary as almost the first step in any attempted improvement.

The outward appearance of a fire place embodying these devices will not require the least modification, and any desired style may be used with the same facility as in the ordinary unimproved form. Furthermore, the increased expense of such a construction need be so little over that of the latter that it would not form a valid objection to its adoption, to say nothing of the saving in cost of fuel sure to be realized from its greater economy of consumption. As the improvements in modern heating stoves consist almost entirely in the increase and better arrangement of the radiating surface, it seems not more than reasonable that the same means applied to grates would produce like results. The portable open grate stove, known in the trade as the Franklin, is built into the fire place, with an air space surrounding it, would be to some extent an illustration of the idea.—*Metal Worker*.

A railway engineer proposes to have a genuine railway collision as one of the attractions of the World's Fair. He undertakes to do the job for \$500.

The putting up of the price of coal by the Reading combine is making the western railroads talk of bringing Colorado coal into competition with the Pennsylvania product.

PERKINS' PATENT SUSTAINED

About two years ago Willis J. Perkins brought suit for infringement of his patent of rotary shingle machines in the United States Circuit Court, for the Northern District of Illinois, against the Interior Lumber Co., which company had purchased and were using a rotary shingle machine, manufactured and sold by George Challoners Sons, who assumed the defence of the suit, employing as their counsel the well known firm of Winkler, Flanders, Smith, Botton & Vilas, of Milwaukee, Wis. The case was stubbornly contested and a large amount of the testimony was taken by both complainants and defendants. After ample preparation the case was presented and argued at length by both sides, at Chicago, before his honor Judge W. Q. Gresham, one of the ablest Circuit Court Judges in the United States, and one whose opinion always carries with it great weight.

After due consideration, his honor Judge Gresham sustained the patent broadly as to eight claims, which claims involve what is known as an automatic spalling device, the shingle bolt dogging mechanism and the supporting block, and oil chamber, which sustain and lubricate the carriage rim.

These patented devices have been found to be absolutely necessary for the successful operation of a rotary shingle machine, and the machines containing such patented devices have supplanted all other kinds of rotary shingle machines.

The spalling device refers to an automatic mechanism whereby a spalling refuse block can be automatically discharged from the machine by removing from beneath it the track or ways on which it is supported. The dogging device refers to the mechanism for dogging and undogging the shingle bolt.

The supporting block for the rim of the carriage prevents any vibration or trembling of the carriage while passing over the saw, and is absolutely necessary to make a perfect shingle.

A permanent injunction was granted which will restrain the further use of all Challoner ten block rotary shingle machines, and prevent the further manufacture and sale of said infringing machines.

Perkins & Co., announce that they will prosecute all infringements both present and future.

It is absolutely impossible to remove the declared infringements from the machine and have an operative machine left, and even if it were possible, an action for damages for the benefits accruing from the past use of the parts enjoyed could be sustained against the owners.

The suit was prosecuted on the part of Perkins & Co., of Grand Rapids, Mich., by Taggart & Denison, of Grand Rapids, Mich., and Offield, Towle & Lithicum, of Chicago, Ill.

The Wm. Hamilton Manufacturing Company Ltd., of Peterboro, Ont., and Vancouver, B. C., are the sole manufacturers of Perkins & Co's shingle machinery in Canada, and their facilities for meeting the shingle trade being ample, there need be no fear of delay, by persons wishing to purchase Perkins machinery to take the place of any other kind.