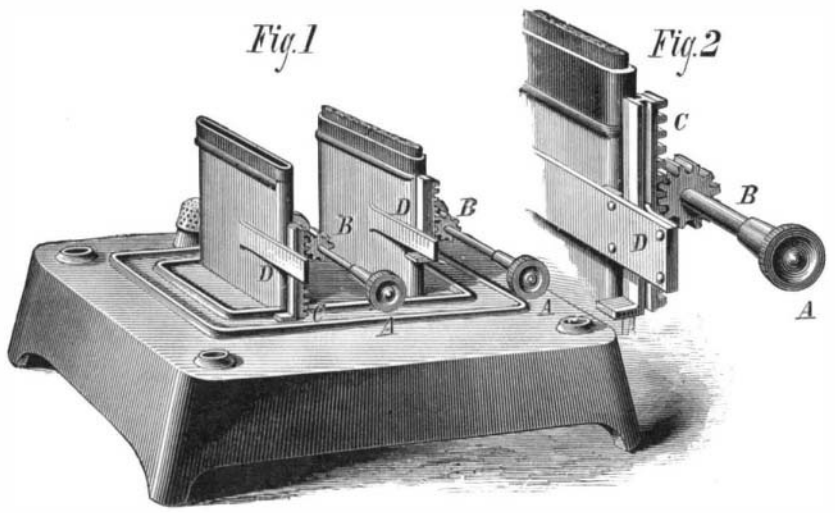
WINTERBURN'S REGULATOR FOR OIL STOVE WICKS.

We illustrate herewith a simple little device for regulating the height of the wicks of kerosene oil stoves. It often happens that these wicks are carelessly turned down so far that a spark enters the space above the oil, and, igniting the gas therein, causes an explosion. The present contrivance prevents this, and at the same time offers a convenient means of limiting the movement of the wick while being turned upward. The cog wheels which act against the side of the wick to lift it up and down are of the usual kind, placed alongside the burner, and are rotated by the milled heads, A. On the shaft of the latter is a wheel, B, Fig. 2, which gears in the rack, C, which is supported on the spring, D, attached to the burner. The rack moves up and down in ways on the face of the spring When the wick is turned down as far as it ought to go, the lower end of the rack strikes against the body of the stove and prevents any further motion of the screw. It is thus rendered impossible for the light to be carried down into the oil. The upward movement of the rack is limited by the offset on its lower end coming in contact with the spring, as shown on the right of our engraving, Fig. 1.

When the wick becomes so much burned away as to necessitate readjustment of the raising and lowering mechanism, this is easily done by simply moving the rack to one side, the spring bending, and turning up the wick sufficiently before putting the rack back in its place.

Patented June 19, 1877. For further particulars address Mr. A. Winterburn, 16 and 18 De Witt street, Albany, N.Y.



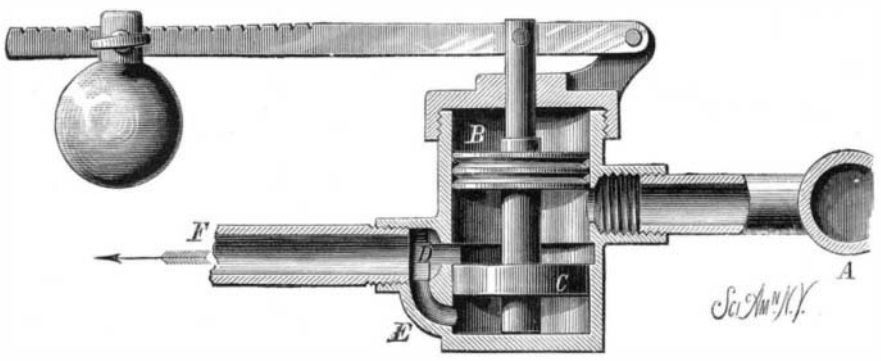
WINTERBURN'S REGULATOR FOR OIL STOVE WICKS.

IMPROVED DIFFERENTIAL PRESSURE REGULATOR.

There are many cases where it is desirable to employ steam for heating, drying, or other purposes, at a less pressure than that existing in the boiler which supplies the engine. The object of the present invention is to enable the steam to be taken directly from the main pipe leading to the engine at any desired pressure, which will not be subject to variation by changes of initial pressure in the boiler. A is the main steam pipe, to which the branch leading to the regulator is attached. The latter is a cylindrical vessel, in which moves the piston, B. The periphery of this piston is channeled to allow of water packing. The stem is continued upward through the casing cover, and to it is attached a lever with adjustable weight. The stem is also continued downward, and carries a second piston, C. As the steam enters between these pistons and acting equally on both, the pressure is balanced, and the steam is free to pass out of the delivery port, D, and thence through the channel, E, to beneath the piston, C. Its pressure here is balanced by the weighted lever, which is suitably adjusted. The supply is then delivered, as indicated by the arrow, through pipe, F. In case the steam pressure should rise above that for which the weight is adjusted, it will be clear that the piston, C, will be lifted and the weighted lever raised. As the piston, C, rises it closes the delivery port, D, and thus the supply of steam is reduced or cut off until the pressure beneath the piston, C, is sufficiently lowered to enable it to descend. The annular groove increases the available area of discharge, and also allows the steam to circulate around the piston, C, when the same closes the port in order to balance it circumferentially.

The device is exceedingly simple in construction and positive in its action, and as it may serve the purpose of saving a special boiler for delivering steam at low pressure it is valuable in point of economy. Patented March 12, 1878.

For further particulars relative to sale of patent, address the inventor, Mr. S. Ashton Hand, 1,506 Arch st., Philadelphia, Pa.



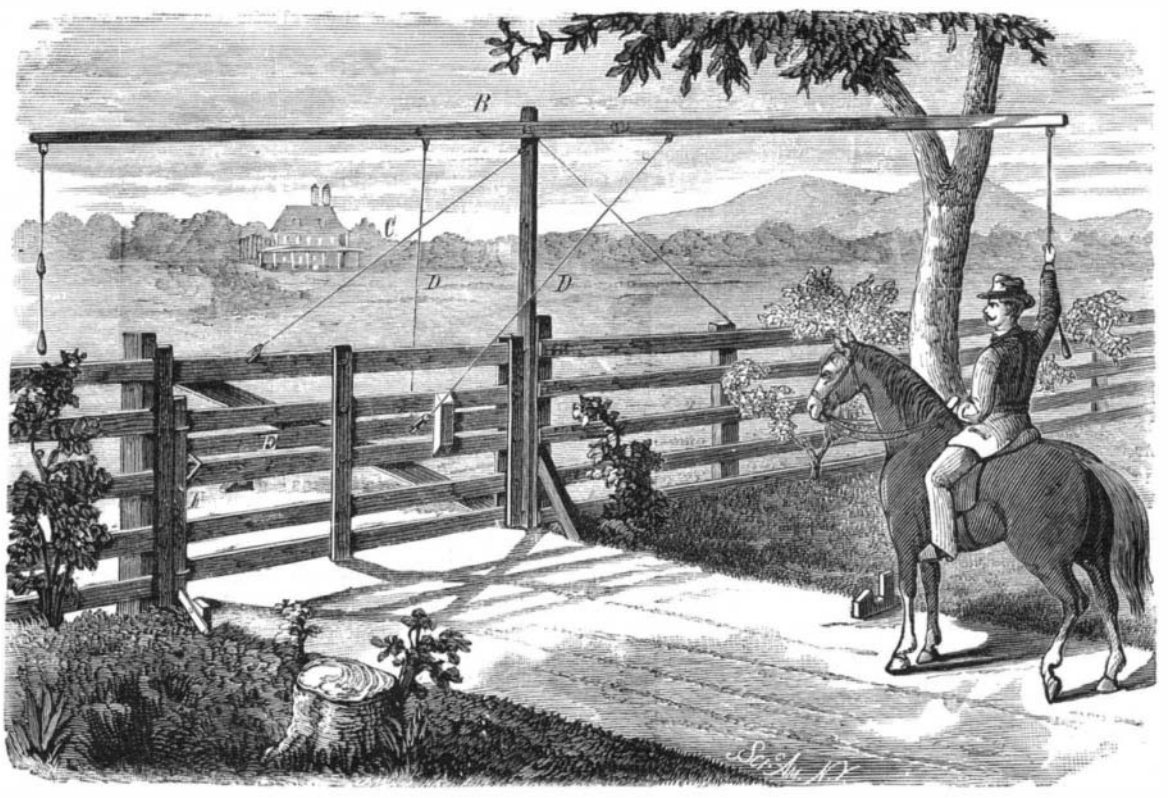
HAND'S DIFFERENTIAL PRESSURE REGULATOR.

IMPROVED FARM GATE.

We illustrate herewith a new farm gate, which may be easily opened without dismounting from on horseback or from a vehicle. The advantages claimed for it are, that it cannot become jammed by frost, wet weather, or snow; that it is so simple that any farmer can make it; it is constructed entirely of wood or iron, opens gently and noiselessly, cannot sag, has a double latch fastening bottom and top, is cheap, and the mechanism is easily attached to any ordinary gate.

The mode of operation is clearly shown in our engraving. On the wire, A, being pulled down, the lever, B, is tilted, so that by the wire, D, the bar, E, is moved sidewise, lifting, by an elbow lever, the vertical bar, F. The end of the bar, E, serves as an upper latch, and the lower end of bar, F, as a lower latch; and it will be evident that both are simultaneously retracted as the wire, A, is pulled. After passing through the gate, which is suspended by the wire, C, the operator pulls the wire on the opposite end of lever, B. The lower latch is thus raised out of a small post, not shown in the engraving, but which is placed beside the fence so as to hold the gate open, and, in the manner already described, causes the gate to swing shut.

For further particulars address the inventor, Mr. N. B. Cooksey, Altamount, Effingham county, Ill.



COOKSEY'S IMPROVED FARM GATE.

WEIGHT OF STEAM.—27·2222 cubic feet of steam at the pressure of 1 atmosphere weighs 1 lb. avoirdupois.

Irradiation.

It is well known that pictures of intensely bright subjects are often too broad. This is frequently observable in connection with light hair in enlargements made in the camera. It is also remarkable in the case of astronomical views of the sun, in which the apparent size of the sun varies according to the length of the exposure. The *Mittheilungen* says that M. Angot has made some precise experiments on the origin of this fault, from which it is supposed that it is possible to calculate the amount of the error. M. Angot took several photographs of an object consisting of two right angles separated by a dark space. Exact measurement of the various images taken under different circumstances furnished the following results: The intensity of the light increases the size of the photographic image. When, however, the light is weaker the image is rather within the geometrical size. Duration of exposure has a similar effect as intensity of light, but there is no proportion between the degree of increase. The irradiation increases also with the sensitiveness of the plate. On removing the stops from the lens, and at the same time considerably increasing the light, it was seen that the images decreased in size as the diameter of the lens increased. Also, pre-exposing the plate exercised an influence on the size of the image. Upon a pre-lighted plate the image is smaller than on a fresh plate. M. Angot finds the explanation of all these appearances in the curvature of the rays of light at the edge of the lens; and, according to this hypothesis, a plate of a certain sensitiveness, and taken with a certain exposure, remains unaffected so long as the strength of the light does not exceed a certain degree.

Natural from Artificial Butter.

The *Pharmaceutische Central-Halle*, after pointing out the unsatisfactory nature of the ordinary microscopical and chemical tests, indicates the following olfactory reactions as at once decisive and simple. An ordinary cotton wick is dipped in clarified melted butter, ignited, and, after burning for two minutes, is extinguished. The vapor arising from the wick is then examined by the sense of smell; when, in the case of artificial butter, the characteristic disagreeable odor of an extinguished tallow candle will be perceived; but in the case of natural butter, simply the well known smell of fried butter. The other method is a little more complicated. Here one volume of melted butter is mixed in a glass retort with two volumes of a mixture consisting of one volume of concentrated sulphuric acid and two of spirits of wine. This is distilled by the flame of a spirit lamp, and a few drops of the distillate are rubbed on the hand. In the case of natural butter this produces an odor of butyric ether; in the case of artificial butter, the repulsive smell of old tallow. The *P. C.* remarks, by way of caution, that in both cases the melted butter must have been freed from all traces of casein.

Charcoal Pencils.

The *Correspondenz* extracts from the *Papier-Zeitung* a description of a new sort of charcoal for drawing with. The ordinary drawing charcoal is made by charring pieces of wood, so that every knot in the wood remains, and there are often scratchy pieces and bits of unequal softness. The new pencils, which have been patented by Herr Heilmann, are made as follows: Sawdust of wood, taken from lime, willow, or even poplar trees, is pressed between wooden moulds having grooves about the size of those made for lead in lead pencils; it is then dried in air and charred in a retort. The hardened sticks are now rubbed smooth, cased in paper, and packed in bundles of twenty-five. The fibers of the wood having been freed from every foreign substance, the charcoal made from it can be moistened with any sort of liquid. Thus, moistened with gelatine it can be used instead of black chalk, or it may be moistened with linseed oil, or with lime water. The charcoal is also prepared of a catechu brown.

© 1878 SCIENTIFIC AMERICAN, INC