

LOW PRESSURE BOILER.

The water holding part of the boiler consists of a series of closed parallel side sections made of cast metal or boiler iron, and of different dimensions according to their position. Two of the sections, *a*, are placed edgewise along the sides of the grate, on the top plate, *c*, of the base, *d*; three or more sections, *e f g*, are arranged horizontally over the fire space, one above the other, with spaces between them about equal to the thickness of the sections. The section, *e*, is sufficiently narrow to leave flue spaces, *h*, between its edges and the sides of the sections, *a*. The intermediate section is wider than the one beneath it, but is arranged, with relation to the sides of the jacket by which the whole is inclosed, to provide flue spaces along its edges. The top section is the full width of the jacket, and is directly beneath the cover. The sections *a* and *e* are connected by horizontal tubes, *l*, and the former are connected by vertical tubes, *m*, to the top section, which is joined to the middle section by central tubes *n*; sections *e* and *f* are similarly joined. The steam or hot water flows away through the pipes, *p*, and returns by the pipes, *p'*. The flue spaces, *h*, are covered by Λ -shaped plates that deflect the heat on to the top of sections *a* before it passes through the passages, *s*, which direct it against the center of section *f*. The heat then divides, and passes up the flue spaces, *j*, to the deflecting plates, *t*, which turn it down on top of section *f*, from which it passes through the openings, *u*, against the bottom of the top section and then into the smoke pipe, *v*. The fire is automatically regulated by the arrangement shown in the perspective view.

Further particulars concerning this simple and efficient boiler may be obtained by addressing the inventor, Mr. D. S. Robilliard, care Quebec Gas Company, Quebec, Canada.

Chucking Wax.

Sometimes the machinist, as well as the jeweler, requires a means of fastening thin work to the lathe chuck, or to a plate for vise manipulation that will not admit of the use of screws, bolts, or similar means. A number of recipes are extant in the shops for the preparation of a wax for this purpose, but most of them are troublesome to mix and annoying in use. Probably as good a fastener as any is melted gum lac—shellac. All the preparation necessary is to melt the lac in a pan or other receptacle, over a slow fire, and while it is still warm shape it into sticks like those of sealing wax or candy, for convenience in use. To be used, the piece to be secured to the chuck should be warmed over a spirit lamp or gas flame, a little of the lac put on in spots, and while warm attached to the face plate and trued by light taps with a mallet. Or the lac alone may be warmed and put on the work. The work may be detached from the face plate or chuck by gentle heating, or if this is inexpedient, by light taps with a wooden mallet.

SHADE ROLLER HANGER.

The hanger is pivoted to a screw, the construction of which is clearly shown in the side views. The screw is screwed into the top piece of a window frame, one hanger being placed at each end. The lower end of one hanger is formed with a squared socket, open at the top, and in the other is a circular socket, these being designed to receive

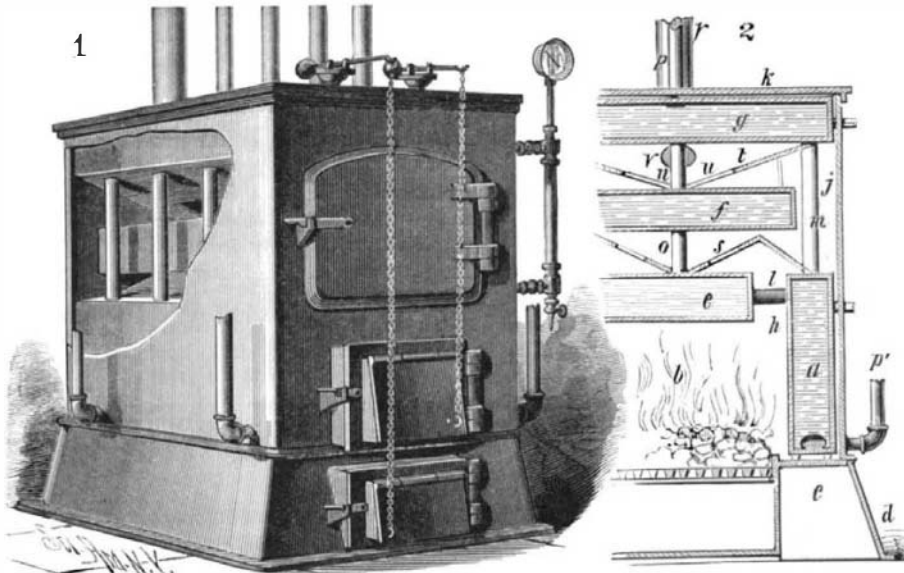
**MULLEN'S SHADE ROLLER HANGER.**

the square and round pins of the ordinary spring roller. The hangers are swung toward the interior of the room to facilitate the placing of the pins in the sockets. By means of this simple device the roller can be hung very easily and rapidly.

Further particulars regarding this invention, which has been patented by Mr. W. J. Mullen, may be obtained by addressing Mr. F. G. Gollon, 107 Walker Street, New York city.

Ventilation.

The ventilation of houses was one of the many interesting subjects discussed at a sanitary convention held in Ionia, Michigan, last December, the proceedings of which have been issued in the form of a supplement to the "Report of the Michigan State Board of Health." Dr. J. H. Kellogg, of Battle Creek, introduced the subject, and dwelt upon the importance of systematic provisions for renovating the air of sleeping rooms, etc. One of the speakers was inclined to contest the necessity of such measures, and doubted if carbon dioxide could reasonably be looked upon as deleterious, except when it was present in large quantities. He added that, even regarding it as highly injurious, compli-

**ROBILLIARD'S LOW PRESSURE BOILER.**

cated arrangements for getting rid of it were not needed. "All you've got to do," he said, "is to cut a hole in the wall at the floor, and let the gas run out of the room." The assistant secretary of the convention, Mr. Erwin F. Smith, of Lansing, subsequently criticised this speaker's views as follows:

"The gentleman has overlooked the law of the diffusion of gases, in obedience to which law gases in contact for any length of time must become intimately mingled. This would entirely prevent any such outward flow of the carbonic acid by its own weight as the gentleman would have us believe could easily be brought about by providing an outlet into the open air at or near the floor. He has also overlooked the fact that carbonic acid gas is not the most injurious of the products of respiration. As stated by the lecturer, the organic matter thrown off from the skin and lungs is the most harmful product of respiration. This organic waste matter, when rebreathed, acts as a direct poison upon the animal economy. It is less in quantity than the expired carbonic acid, but occurs along with that, so that when we have established the presence, from expiration, of an excess of carbonic acid in any room, we have at the same time proved that a more deadly, if not so easily detected, enemy is also present. This organic waste matter rises with the warm expired air to the ceiling, whence, as it cools, it is gradually diffused downward. Those who have carefully examined our poorly ventilated State prisons have repeatedly had demonstrated to them by the sense of smell, if not otherwise, that the upper layer of air in a room occupied by large bodies of men becomes soonest charged with foul emanations. In sleeping wards where cells rise above each other in from three to five tiers, the impurity of the air, as shown by the sense of smell and general feeling of oppressiveness, increases as one ascends from one gallery to another, until, toward morning, on the uppermost gallery near the ceiling, the stench and oppressiveness of the air become almost intolerable; and this, too, in spite of the fact that in the State House of Correction, at Ionia, numerous openings have been provided in the outer walls near the floor for the express purpose of ventilation. It is also true, as I know by observation, that prisoners who sleep in ranges of cells near the ceiling complain more of headache, have less appetite, and eat considerably less food than those sleeping in cells near the floor. From these considerations I think it is apparent that a room cannot be properly ventilated by simply making an out door opening at or near the floor."

Shortsightedness.

A writer in the London *Times* claims the cause of myopia to be the application of the eyes to near objects; in other words, the poring over books and handicrafts. When the eyes are directed to a near object, they are turned in or rendered convergent, so that the axes of vision meet upon it, and this position is maintained by a muscular effort which, if continued, alters the shape of the eye in the direction of elongation. Manifestly, the alteration will be most easily effected during youth, when the tissues of the body, including those of the eye, are comparatively lax and distensible, and it will also be most easily effected among those young people whose tissues are exceptionally weak, by reason of inadequate food or of unhealthy descent or surroundings. Badly lighted schools are the great manufactories of myopia, the bad light compelling approximation of the books or other materials of study.

Poisonous Solder in Canned Goods.

Dr. John G. Johnson, having had six cases of poisoning from the eating of canned tomatoes, read an excellent paper on the subject before the New York Medico-Legal Society, which is published in the *Sanitarian* for June. He concludes after a careful review of the subject that:

1. These were not cases of sickness from spoiled tomatoes.
2. They were cases of corrosive poisoning from muriate of zinc and muriate of tin.
3. This poisonous amalgam must be abandoned.
4. Exemplary damages, "at the discretion of the jury," will be sustained by the courts for this reckless tampering with human life in using a dangerous means when a safe one could be used.

5. The canners have only themselves to thank for the present panic in their business, for they have persisted in the use of this dangerous amalgam, knowing it was dangerous.

6. Every cap should be examined, and, if two holes are found in it, send it at once to the health board, with the contents and the name of the grocer who sold it.

7. Reject every article of canned food that does not show the line of resin around the edge of the solder on the cap, the same as is seen on the seam at side of the can.

8. "Standard" or first class goods have not only the name of the factory, but also that of the wholesale house which sells them, on the label. "Seconds," or doubtful or "reprocessed" goods, have a "stock label" of some mythical canning house, but do not have the name of any wholesale grocer on them. Reject all goods that do not have the name of some wholesale firm on the label.

9. A "swell" or decomposing can of goods can always be detected by pressing in the bottom of the can. A sound can, pressed, will give a solid feel. When gas from the decomposition of the food is inside the can, the tin will rattle by pressing up the bottom as you displace the gas in the can.

10. Reject every can that shows any rust around the cap on the inside of the head of the can.—*International Review of Med. and Surg. Technics*, Oct., 1884.

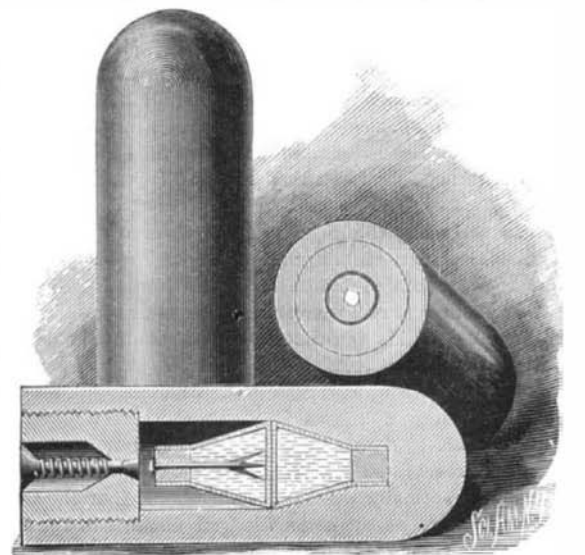
Remedy for Gout.

Dr. J. Mortimer Granville publishes in the *Lancet* (Aug. 10, p. 272) a prescription for the relief of gout, which he states gives satisfactory results in acute and subacute gout, relieving the pain almost immediately, reducing swellings, and raising the proportion of urea in the urine from 50 to 100 per cent. The formula he gives is as follows: Ammonii chloridi, 3 iv.; potassæ chloratis, 3 ij.; glycerini, 3 xij.; tincturæ iodi, 3 ij.; aquæ ad 3 xij.—Misc. The dose is two tablespoonfuls every third, fourth, or sixth hour.

IMPROVED EXPLOSIVE SHELL.

The shell is made of cast iron or other metal, and its butt end is closed by a screw plug. In the cavity of the shell are held two funnel-shaped glass vessels, each being formed with a neck which is closed by a stopper. Passing through the stopper in the rear vessel is a rod, the inner end of which adjoins the base of the vessel, and is provided with prongs. On the end of the rod is a head, and in the end of the shell is a firing pin held in a central opening in the plug, and forced toward the outer end of the plug by a spring. The vessels are filled with two distinct liquids which, when they are mixed, form a highly explosive compound.

The shell is fired from a cannon, the force of the explo-

**BACHELDER'S IMPROVED EXPLOSIVE SHELL.**

sion forcing the firing pin into the shell and breaking the glass vessels, so that the substances mix as the shell leaves the cannon, and form a compound ready to explode when the shell strikes any object. The compound must be of such a nature that it will not explode immediately upon being formed, but will only explode when it receives a heavy shock. The shell is perfectly harmless until the vessels are broken. This invention has been patented by Mr. J. L. Bachelder, of Globe, Arizona.