"Crackle" Glass.

This variety of glass, which has become so fashionable on account of its effective and crackled appearance, is, according to the *Glassware Reporter*, very easily made.

It is produced by covering one side of a piece of plate glass with a thick stratum of a flux or readily fusible glass, mixed with coarse fragments of glass. In this condition it is placed in a muffle, or an open furnace, where it is strongly heated. As soon as the flux is melted and the glass itself has become red hot, it is removed from the furnace and rapidly cooled. The flux (or fusible glass), under this treatment, cracks and splits, leaving innumerable fine lines of fracture over its surface, having much the appearance of scales or irregular crystals, which cross and intersect each other in every direction, producing very striking and beautiful effects when the light falls upon its surface.

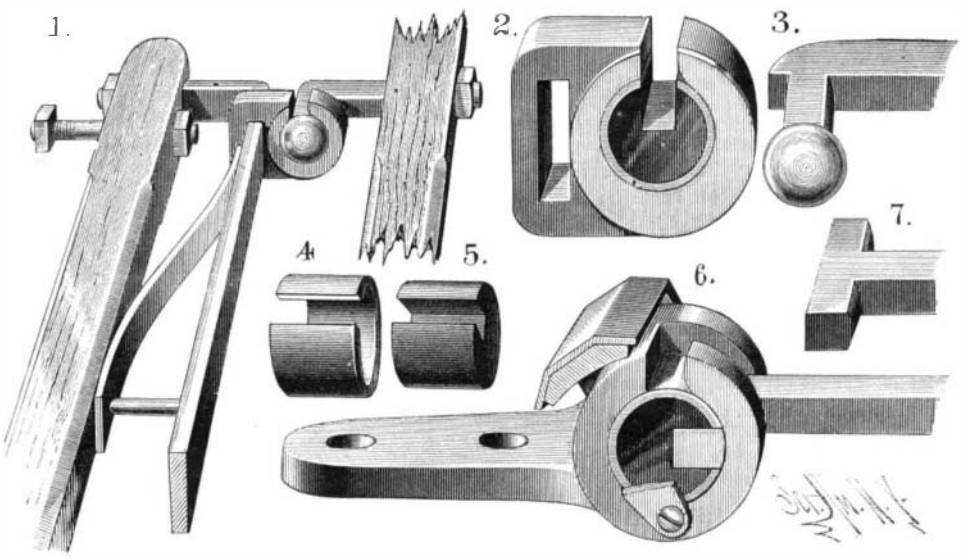
The rapid cooling of the fusible coating is effected either be exposing the heated mass to the action of a current of cold air, or by cautious sprinkling with cold water.

By protecting certain portions of the glass surface from the action of the flux, these portions retain their original smoothness and polish, and form a striking contrast to the crackled portions of the surface. By this means inscriptions or decorative designs of every description are produced upon a colorless or colored ground.

A modification of this method of producing crackle glass is the following: A coarsely granular flux is strewed upon the surface of a glass cylinder, while the latter is red hot, until the flux melts. It is then removed and rapidly cooled either by the use of water or by waving it about in the air. The stratum of melted flux is then caused to crack as above described. The cylinder is then cut, flattened, and brought to a level surface in the usual manner.

IMPROVED THILL COUPLING.

Our engravings show the various parts of a thill coupling, for which letters patent have been obtained by H. M. Wheeler, M.D., of Grand Forks, D. T. It is so made as to prevent all rattling, is strong and secure, and the change from thills to pole, or *vice versa*, can be effected in a very short time. Fig. 2 is a perspective view of the knuckle used on cutters; it is made of casehardened malleable iron, and is formed with a rectangular transverse slot and a circular transverse opening, the lower part of the forward wall being cut away to form a bevel. Within this opening is placed the incomplete metal ring, Fig. 4, which in turn receives the rubber packing, Fig. 5. In Fig. 3 is shown the L-shaped head, in which the thill or pole straps terminate, and Fig. 1 illustrates the application of the coupling to cutters. The heads are movable upon a flat iron bar which replaces the round rod ordinarily used in cutters, and which enters the transverse slot. The draw-heads are governed by springs as in other cutters, insuring side or central draught and giving the proper position for the pole when both springs are in use. Thills or pole to be inserted are placed in a vertical position, and the horizontal part of the head enters the slots and passes down into the recess in the rubber packing. They are then brought down into a horizontal position, the bevel serving to drive the metal into the rubber—the groove in the rubber being too shallow to receive it without pressure. Fig. 2 also represents, with slight alterations as to attachment to the axle, couplings for light buggies.



WHEELER'S IMPROVED THILL COUPLING.

In the coupling, Figs. 6 and 7, designed for heavier buggies and road wagons, the draw-head is much wider than the one above described, and the circular opening may or may not extend through the head. The transverse slot at the top extends two-thirds across the top and intersects with a vertical slot. A cap or cover which is cushioned with rubber, is secured with rivets as indicated, and when turned back it permits the T-shaped head, Fig. 7, to be inserted or removed, and when turned completely forward it permits the removal of the metal cylinder. The two couplings, comprising the pair, work from the same side. The thills are placed vertically, the T heads inserted in the slots and pressed into the rubbers when they are moved laterally, until the stem of the head is opposite the vertical slot, when they are brought down to a horizontal position. The covers are then adjusted, and held in place by the friction of the rubber cushion.

The Use of Old Muskets.

An exchange says that the condemned muskets of the Government—the Enfield and Belgian rifles and other firearms of the late war—find purchasers among Grand Army posts, amateur military companies, and speculators for foreign markets, some of them being converted into breech loaders for sporting purposes.

There is still another demand for them which is not generally known. Large numbers of smoothbore musket barrels are remounted and restocked, and are highly valued as duck guns and for other field sporting purposes, even without being converted into breech loaders. A sportsman, who is a very successful hunter, said recently that an old musket barrel restocked was his most valuable gun, and yet cost him only $8, and he has in his collection several of the most costly breech loading "stub and twist" guns, worth $100, more or less, each.

But whatever may be the value of these gun barrels, it is certain that a very large number find their way into the market as sporting guns. A gunsmith with an experience of twenty-five or thirty years lately answered, in response to an inquiry, that a very large proportion of his business was the alteration and remounting of old military gun barrels, which form a considerable portion of the sporting gun seller's stock in trade. The cost of these guns is very slight, and their market price brings them within the reach of most purchasers. But a gun with real twist barrel is a costly article. Instead of being rolled from a plate or "skelp" between grooved rollers and welded at one rapid operation, it is patiently hammered into a cylinder by hand. The mottled, damascened, or striated appearance is produced by a series of wires of differing irons twisted into cables and then welded into square rods. These placed side by side and heated to a weld are wound a half turn, or perhaps more, at a time on a mandrel, and seated (welded) against one another by repeated taps of a light hammer. The ribbon thus formed of cables of fine wire may consist of not less than thirty-six or even fifty-two strands of wire.

The Electric Light for Country Houses.

A very pleasing example of electric lighting for country dwellings is described in *The Architect* as having been introduced at Linden Park, near Hawick, N. B., the residence of Mr. Walter Laing. A small stream runs through the grounds, and advantage has been taken of this to obtain power for producing electricity for lighting the mansion and stables. A turbine wheel has been erected capable of giving off about eight horse-power, and requiring about 270 cubic feet of water per minute when working at full power. As the stream will not in dry weather give nearly so much as this, a reservoir, in the shape of a small lake of about an acre in extent, has been constructed in the bed of the rivulet.

In the driest weather the stream may be depended upon to give at least 80 cubic feet per minute, and this being stored up in the reservoir during the daytime, more than sufficient force is obtained for working the turbine when the lights are required at night. The turbine is fixed in a small building, and is connected by a short belt with the dynamo, which is a Siemens compound self-regulating machine, capable of supplying about seventy "Swan" incandescent lamps of 16 candle-power each. From the dynamo the necessary conducting wires are carried up to the house, partly on posts overhead and partly underground, branches being taken off to supply the stables and the avenue from the lodge. About 100 Swan incandescent lamps have been fitted up altogether, and of these 70 can be worked at once, and all or any can be turned on or off at pleasure. Most of the lights are of about 16-candle power, but a few are 32. About 80 lights are distributed through the house, lighting every portion, no other kind of light being provided for. Seven lights are taken up in lighting the stables, and twelve outside. These latter are all controlled by one switch near the hall door, and can either be lighted or extinguished instantly.

The effect of the instantaneous lighting up of the drive on a dark night is novel and pleasing. The distance of the turbine and dynamo from the house is about 350 yards, and from the house to the lodge about 400 yards, so that a circuit approaching a mile in extent has to be traversed by the electric current which goes to the farthest lamp. Very little attendance is required by the dynamo-machine or turbine, all that is necessary being to turn on the sluice valve admitting the water to the turbine when the lights are required, and it is only necessary for a man to inspect the machines about once in the evening.

For stopping the turbine at night when the lights are no longer required a simple electrical arrangement has been designed, by means of which the sluice valve can be closed from the house without going down to the turbine house. This is done by merely touching a handle, and so admits of the lights being burned late, and put out at any time without the necessity of keeping any one in attendance to turn off the water when done with. The steadiness of the lights is absolutely perfect, and there are no products of combustion whatever given off to contaminate the air of the room and spoil the decorations.

Natural Gas Fuel at Pittsburg, Pa.

At the recent meeting of the American Society of Mechanical Engineers at Pittsburg, the report of the committee appointed to investigate the whole subject of natural gas was made, and many interesting particulars given.

Though Pittsburg is within reach of three or four prolific localities, and gas has been used for many years, it is but recently that any organized effort has been made to use it on a large scale. Already there are a hundred and fifty companies chartered in the State, representing over two million dollars; and gas is brought from eight to twenty five miles for use in the city. Five-inch mains are being followed by eight-inch, new wells are being bored, and the time when Pittsburg shall become a smokeless city may not be far distant. Though the gas is used under a pressure of a few ounces, the pressures at the wells run from fifty to a hundred and twenty five pounds; this is due to the friction in the mains, five pounds being allowed for each mile. If the flow be shut off the pressure runs up much higher, and great difficulty has been experienced in making tight joints; cast iron is too porous, and ordinary pipe threads do not fit well enough. A number of new coupling devices were exhibited, in some of which a lead packing was used. No allowance for expansion need be made, as the gas maintains an even temperature of about 45° Fah. When gas is allowed to burn freely at the mouth of a well, the cold produced by the expansion is such that ice has been projected through the flames.

The gas is used in all kinds of furnaces for making steam, iron, glass, etc.; and electric light carbons, and the finest lampblack for printing inks, are made from it; but it is used with suicidal wastefulness, which causes anxiety, as many wells give out in less than five years. The report looks to its economic and safe control. For household use it might otherwise be dangerous; and such use has commenced, though no practicable method of deodorizing it has been found. Being composed largely (ninety-six per cent) of marsh gas, its value as a heating agent is high, and its density is about half that of air. One pound (23·5 cubic feet) of gas has a theoretical evaporating power of twenty-four pounds of water, twenty pounds having been actually evaporated. The best method of burning it is not generally known; experiments with injector burners show that they do not suck in sufficient air for complete combustion, and the best results have been from numerous jets in contact with the whole heating surface of the boiler. The value of the gas, as compared by evaporation tests with coal at $1.40 per ton, is only eight cents per thousand feet (which suggests that even our ordinary gas companies make profits), but its use is immensely more convenient; no stacks are needed, and the furnace reduces to a simple non-conducting chamber. The gas has just been turned on to the city water works. On the first day's excursion numerous furnaces were seen running with gas blown in through rough, one-eighth inch nozzles; and two or three lines of five-inch pipe lay on the surface of the railway embankment.

A gas well has lately been opened within the city limits, at a depth of 1,600 feet, on the property of Mr. Westinghouse.

Length of Our Lives Increasing.

At a recent international health exhibition held in London, Sir James Paget delivered an address before the association, the Prince of Wales being present.

The learned physician asserted that people live longer than formerly, and that less sickness prevails among the mass of people, and he then gives the following reasons for the decrease of mortality during the last few years:

"There is less from intemperance, less from immorality; we have better, cheaper, and more various food; far more and cheaper clothing; far more and healthier recreations. We have on the whole better houses and better drains, better water and air, and better ways of using them. The care and skill with which the sick are treated in hospitals, infirmaries, and even in private houses are far greater than they were; the improvement and extension of nursing are more than can be described; the care which the rich bestow on the poor, whom they visit in their own homes, is every day saving health and life; and even more effectual than any of these is the work done by the medical officers of health and all the sanitary authorities now active and influential in every part of the kingdom. But we want," adds the lecturer in closing, "more ambition for health—a personal ambition for renown in health as keen as is that for bravery or for beauty, or for success in our athletic games and field sports."