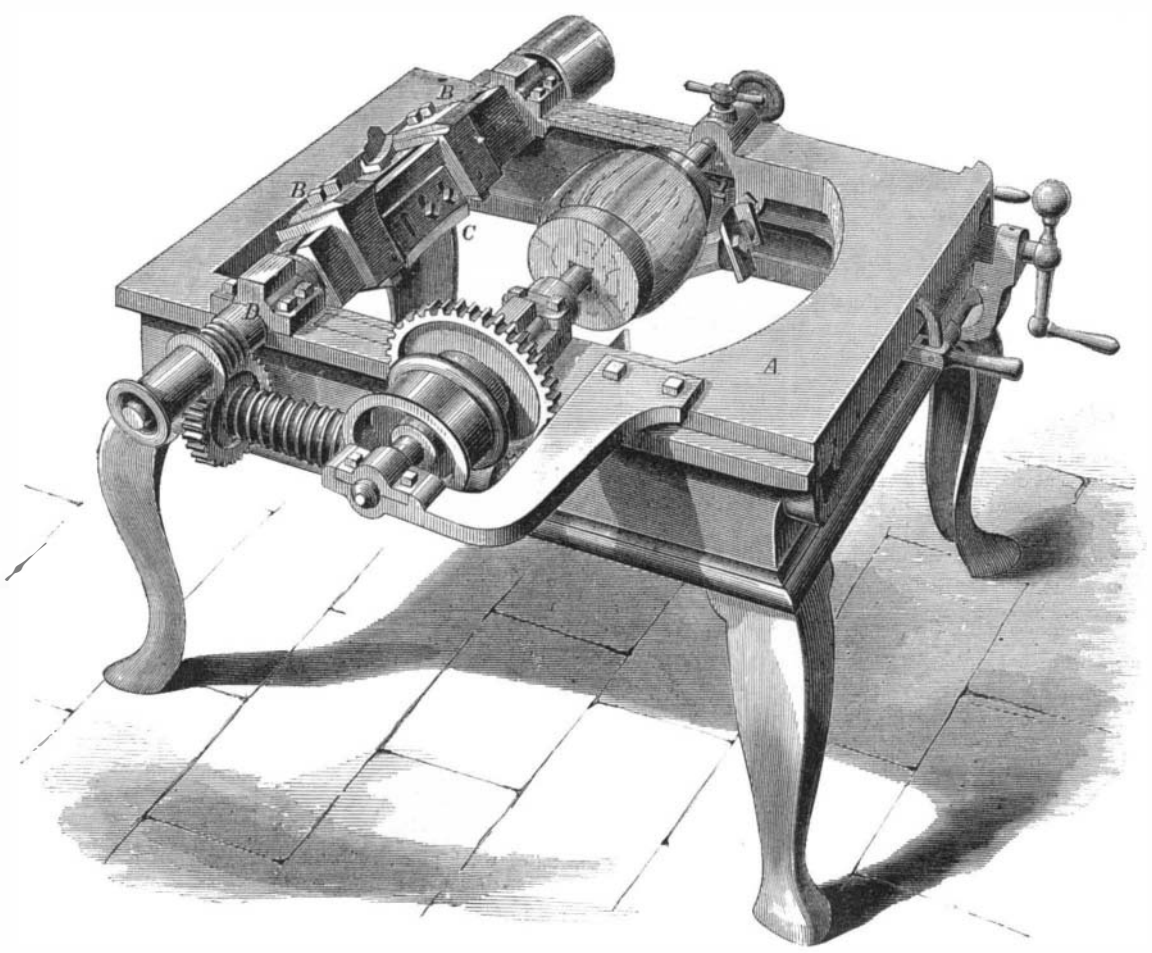
IMPROVED HUB LATHE.

The accompanying illustration represents an improved hub lathe for turning the hubs of vehicle wheels, which is at the present time employed at the American Hub and Spoke Factory at Schoharie, N. Y.

The logs of elm, white oak, and birch are first cut with circular saws into pieces of proper length, which, after being bored by suitable machinery, are, while still untrimmed, with the bark on, placed in the lathe. The block is fixed to a mandril arranged on the sliding carriage, A, on which, by means of the power transmitted by the two spirally threaded shafts and cog wheels, gearing with the cutting shaft as shown, it is drawn up to the cutting knives, B and C. The latter somewhat resemble plane irons, but are shorter and stronger, and their edges are shaped to correspond with the edge of a vertical section of the hub. They are four in number, for each machine, and are fastened by bolts to the sides of the strong shaft, D, which is some four inches square. This shaft, by the pulley represented, is caused to revolve very rapidly, the knives, B, cutting the straight portion of the convex surface at the ends of the hub, and the blades, C, forming the curved and grooved central portion. The diameter of the hub is regulated by putting a pin in a hole in the frame on which the carriage moves. The lathes are of different sizes, each being adjustable to work of varying dimensions. The smallest hubs made are six inches long by three in diameter, and the largest eighteen by twenty inches. At the factories above mentioned machines are in operation, turning daily from forty to fifty sets of the larger sized hubs, and from sixty to eighty sets of buggy hubs. The smaller sizes are finished, we are informed, in less than one minute, and the larger sizes in from one to two minutes. It is claimed that the work is performed better than it can be accomplished by hand, for the reason that the hubs are turned perfectly smooth and of exact uniformity in size and style.



RICKART'S PATENT HUB LATHE.

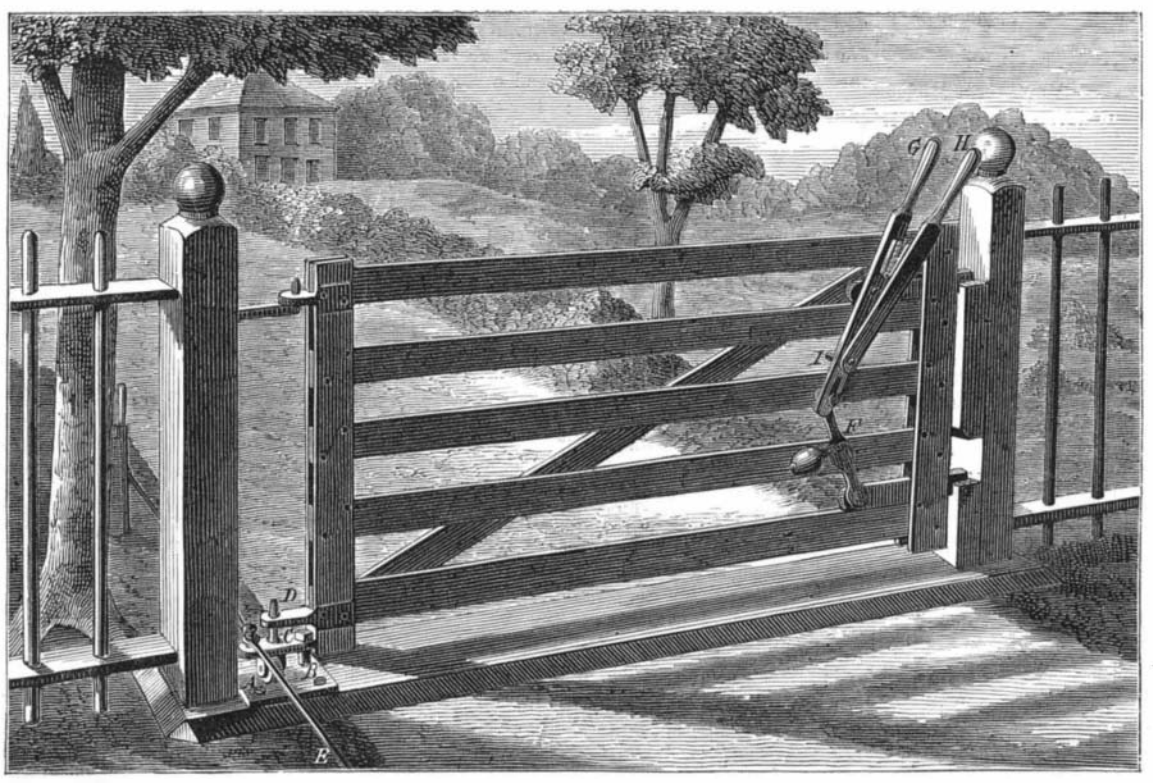
For further particulars regarding sale of machines, rights, etc., address the owner of the patent, Mr. Treat Durand, Schoharie, N. Y.

IMPROVED FARM GATE.

The invention represented in the accompanying engraving is an improved form of farm gate, with which is combined suitable mechanism for opening and closing, which is actuated by the operator some distance off, thus enabling a person to operate the gate without alighting from his carriage. The construction of the device is also such that it is not liable to be pushed open by cattle rubbing against it.

On the hinge post, and a little above the ground, is attached an inwardly projecting metal plate, A, to which, near its free end, is fastened a short stud, B. The latter serves as a pivot for the short arm, C, through the middle part of which passes a pin carrying a small wheel at its lower end. This wheel rests upon the plate, A, and is beveled so that it may readily cut through ice or snow that may pack upon said plate. The upper end of the pin enters the strap, D, attached to the gate. On the inner extremity of the short arm, C, is formed a projection to receive the eyes of rods, E, which extend from the gate in opposite directions, as shown, and communicate with hand levers suitably arranged. The latter are located at the side of the roadway at such a distance from the gate that the operator will be out of the way of the same when it swings open or shuts.

By this construction, when the inner end of the arm, C, is moved in either direction by the rods and levers just mentioned, the forward end of the gate, is raised, when the latter becomes unlatched and swings open in a contrary direction; or similarly, by actuating the lever in the opposite way, the gate may be caused to shut. The use of the forward end enables the gate to swing over snow, ice, or any other temporary obstruction. The two latches shown work in slots in the upper and lower parts of the forward crossbar and engage in the catches on the front post. The inner end of the lower latch is pivoted to a short lever, F, also pivoted to the gate, and connected similarly with a lever, G, which projects above the gate, and is readily operated. To the lever, F, is attached a weighted arm, which serves to throw the latches forward into position. H is another hand lever hinged to the lever, G, as shown, and having at its lower end a pin, F, which passes through an orifice in the latter. By this means the lever, G, cannot be worked to withdraw the latch without pressing the handle of the lever, H, inward, and so pulling out the pin, I. This device serves to prevent cattle from opening the gate by rubbing against it. The gate may be constructed of wire, iron, or any other suitable material.



GILLESPIE'S FARM GATE.

Patented through the Scientific American Patent Agency, June 10, 1873. For further information, address the inventor, Mr. Cyrus E. Gillespie, Edwardsville, Madison Co., Ill.

Alcohol in Bread.

In the ordinary process of bread fermentation, a portion of the sugar contained in the flour is decomposed and converted into alcohol. It has been heretofore supposed that by the heat of baking the whole of this alcohol was expelled, but recent experiments, made by Thomas Bolas, in London, indicate that a perceptible amount of alcohol still remains in yeast-raised bread after baking. The result of six experiments showed that one third of one per cent in weight of alcohol was obtainable from fresh baked bread; but the quantity of alcohol was much less in stale bread. From forty loaves of fresh bread, two pounds each, alcohol equal to one bottle of port wine may be extracted. From what is known as "aerated bread," or bread raised by mixture of carbonic acid gas with the dough, without fermentation, no alcohol can be extracted.

Fabricating Sulphate of Ammonia from Nitrogenous Waste.

A great quantity of nitrogenous substances, such as the waste or clippings of wool, skins, leather, horn, feathers, sponge, etc., are thrown away in various industries; these materials contain from six to fifteen per cent of nitrogen, and often enter into the fabrication of so-called organic manures. Their putrefaction in the soil is, however, a very slow process, hence it is of importance to obtain their nitrogen in the more assimilable state of ammonia. To effect this, M. L'hote proposes the following process:

When the substances are treated with a tenth part of solution of caustic soda, cold or slightly warmed, in order to avoid an ammoniacal production, they are not only dissolved but completely disaggregated. The viscous liquid so prepared is then mixed with slaked lime to form a pasty mass, which is introduced into a cast iron retort which communicates with receptacles containing chambers of sulphuric acid. Distillation is effected (at as low a temperature as possible, in order to avoid the dissociation of the ammonia) until all disengagement of gas ceases when the retort is brought to a red heat. When the operation is concluded, a white pulverulent residue is found, composed exclusively of carbonate of soda and quicklime, which treated with water, regenerates the caustic soda, which may be again employed. The sulphate of ammonia obtained is colored but may be purified by crystallization. If care be taken to operate on a homogeneous mixture of nitrogenous and alkaline wastes, all the organic nitrogen may be recovered in the state of ammoniacal nitrogen as the product of distillation.

Dissolving Action of Glycerin on the Oleates and on Sulphate of Lime.

M. Asselin has made a series of researches with the view of determining the solubility in glycerin (1) of soaps, made with metallic bases, of magnesia, and of lime; (2) of soaps (*sous-savons*) made with an excess of base; (3) of the sulphate of lime of calcareous waters.

Operating with pure glycerin of a density 1·114 he obtains the following results: 100 parts glycerin dissolve 0·71 soap, iron base; 0·94 soap, magnesia base; 1·18 soap, lime base.

A series of experiments upon the metallic and earthy soaps of the second class above mentioned, which impregnate the fibers of wool during carding, gave variable figures, due to the badly defined composition of the materials treated. A quick emulsion was obtained in water charged with glycerin, in a degree directly proportional to the recent formation of the soap. Sulphate of lime and, notably, the compound $(CaOSO_3)^2$ H O dissolved in the proportion of 0·957 in 100 parts of glycerin. Moreover, and, contrary to the case with pure water, the ratio of solubility augmented with the elevation of temperature.

Considering these facts and the hygrometric properties of glycerin, the part which it should fill in woolen industries is clear. Its moderate employment will permit of the fabrication of tissues in plain tints and light colors which have been generally regarded as impossible to obtain, and the soft feeling which it communicates to the wool will give a real superiority to the cloth made therefrom, and will, by increasing the flexibility of the fiber, render it more durable.

DR. JOSEPH G. RICHARDSON, of Philadelphia, has discovered that the corpuscles of the saliva are migrating white blood-globules. So, the more you spit, the more you rob your system of blood. Smokers and tobacco chewers, take notice.