

COMBINED HAND AND SLIDE LATHE.

We illustrate herewith a very useful combination lathe, constructed by Messrs. Low and Duff, of Dundee, Scotland, and exhibited by them at the recent Exposition at Manchester, England. The tool is specially adapted, says *Engineering*, for small brasswork, etc., and it is fitted with a reversing motion for tapping.

In Fig. 1 the tool is shown as arranged when fitting the key or plug of a gas joint with the slide. This operation having been performed, the set screw, A, is loosened, and the slide moved on the circular table to the back of the lathe, the hand rest being brought round into the position which the slide occupied. The barrel of the joint is then put on, the hole drilled and tapped at the end for the small screw, and the piece of work finished without being taken out of the chuck. The slide is so mounted that it can be readily set to any desired taper, and the table on which the slide and hand rests are mounted is moved up to a stop, so that, when the slide is once set to any desired angle, it can be moved out of the way and brought back again without requiring further setting, so long as the same class of work is being gone on with.

For work which requires to be mounted between centers, a loose head is provided, this head being shown swung down out of the way in Fig. 1, but in use in Fig. 2, where the plug of a large cock is being operated upon. Altogether this machine is a very compact and handy one, and it appears capable of getting through a large quantity of work.

Hypodermic Injection of Nutritious Substances.

Dr. Krüg, a physician in a private lunatic asylum, gives an account of a trial of this which he has recently made.

C. E., aged fifty-seven, a Hungarian proprietor, has been in an asylum at Ober-Döbling since 1868, and for the purpose of suicide had often refused all food, so that for twenty-seven months at a time he had to be daily fed by means of the tube; of late he has been more inconstant in his refusals, sometimes eating even abundantly, and at others allowing himself to be fed. On January 18, however, he began again to absolutely refuse food, and so continued, with the exception of one day, to the 24th, when it was resolved to feed him by the tube as heretofore; but all attempts to pass this proved fruitless, such violent coughing and irritation did it cause, so that the patient became breathless and cyanotic. Even when the tube was got into the stomach, the fluid injected was immediately expelled again by its side; so that the whole procedure, inducing so much suffering, proved useless. As ten days had elapsed without his taking any food, with the exception of some soup once, it was resolved to try the subcutaneous injection, under the hope that a slight quantity of nutriment might be so supplied, so as to ward off danger to life and perhaps exert a favorable impression on the patient when he found his resistance unavailing. Olive oil was the substance injected, the syringe employed holding 0.9 cubic inch. To the syringe was attached a thin caoutchouc tube, terminated by the canula of an ordinary subcutaneous syringe; so that the movements of the patient did not derange the working of the apparatus. One or two syringes full were injected daily, being from 0.9 to 1.8 cubic inches of oil. At first each syringe-full was thrown into five apertures, but afterwards into three, or even only two. The oil passed, drop by drop, out of the canula, so that at first an hour, and afterwards half an hour, was occupied in the emptying of each syringe. This slow procedure rendered the injection painless, and prevented reaction, which, as well as pain, was caused when the injection was made too rapidly, or too much fluid thrown into one spot. Most of the injections were made in the foot, some in the belly, and others in the sides. Some effect was produced upon the patient's moral condition, so that he partially abandoned his opposition to food. Thus, during thirty nine days, he completely fasted during nine, ate voluntarily during ten, and was supported by the injections during the other twenty. It was not possible to weigh him, but his general appearance was not changed for the worse. With some occasional exceptions, when the injections were resumed, the patient gradually abandoned his resistance, and at last ate in a natural way, the experiment lasting altogether about two months. The chloroform odor,

characteristic of fasting persons, disappeared soon after the first injection.

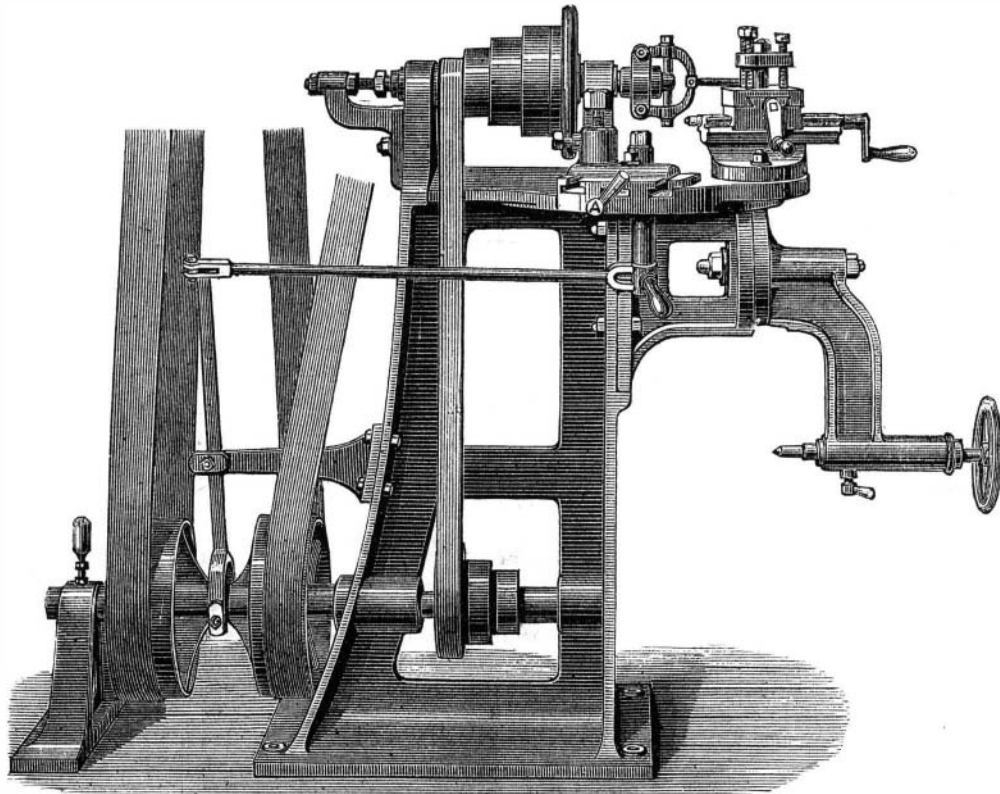
Salt for Domestic Animals.

Salt is not only a mild aperient or deobstruent, but it operates, to some extent, as a tonic. It is a very great rectifier of the acidity of the stomach when taken in proper quantities; and it not only renders very palatable food which would be disagreeable and insipid without it, but it keeps the functions of the stomach in a healthy state and often alleviates

are kept in pasture where there is much clover (*trifolium pratense*), they usually have a great hankering after salt; and if they can have access to it, they will go and lick, more or less, several times during the day; and they will consume just enough to rectify the acidity of the stomach, and keep them from bloating. Many a farmer has lost a fine animal, in consequence of bloating, which one pound of salt would have kept in good health.

High Speed Brake Trials.

In consequence of a statement made by one of the principal officers of the Midland Railway Company, England, with reference to the collision at Kildwick, to the effect that the engine driver of the mail train would have been able, with the means at his disposal, if traveling at the rate of 50 miles per hour, to stop his train in 400 yards, certain brake experiments were lately made in the presence of Captain Tyler, on the Derby, Castle Donnington, and Trent line. There were four trials. In the first of these experiments all available means were used to stop the train, namely, tender brake and one guard's van brake at rear of train applied, sand used, and engine reversed and steam against it, with the Le Chatelier tap open. The gradient was level; the train, the total weight of which was 102 tons 7 cwt. 2 qr., was running at the rate of 49.9 miles per hour when the brake was applied. The result was that 54 seconds were occupied in stopping the train, which, after the application of the brake, ran a distance of 807 yards. In the second experiment all available means were used except reversing the engine; gradient 1 in 330 up and level, speed 49.9 miles; time occupied, 60 seconds; distance run, 843 yards. In the experiment all available means were used, and when the engine was



IMPROVED HAND AND SLIDE LATHE.—Fig. 1.

the effects of debility and disease. The true way is to have a tub of salt placed where cattle, horses, and sheep, can have access to it at all times, whether they are in the pasture or in the barnyard. Then, when the appetite calls for a lick or two of salt, they can go and get it, at the very time it is most needed, and when it will exert the most beneficial effect on digestion or on any part of the system.

A good plan is to keep salt in a small tub or strong watertight pail, in the pasture during the pasturing season, and in the yard during winter. Animals will not consume as much when they are supplied with it in this way as they will when they are salted once or twice only during a week. It is slovenly and wasteful to throw salt on the ground for animals, and especially for sheep, as they will often waste half as much as they consume.

For salting sheep, drive three or four high stakes around

reversed, the regulator was allowed to remain wide open all the time; gradient, 1 and 220 down, speed, 52.5 miles; time occupied, 55 seconds; distance run, 867 yards. In the final experiment all available means were used. When reversing the engine the steam was first shut off, then the lever pulled into back gear, and then steam was turned on again as in first experiment; gradient, level; speed, 52.5 miles; time, 50 seconds; distance run, 787 yards. The weather was fair, and the rails slightly greasy. Captain Tyler, in his report to the Board of Trade, states that the engine driver of the mail train, who at present awaits trial on a charge of manslaughter, could not have acted so promptly as those who, on the experimental train, listened for the word of command. He adds that, instead of 400 yards, 800 yards should have been stated as the distance in which, with the assistance of the guard, he could have stopped his train. From this it appears that, at almost 50 miles an hour velocity, a train will run nearly half a mile after the brakes are applied.

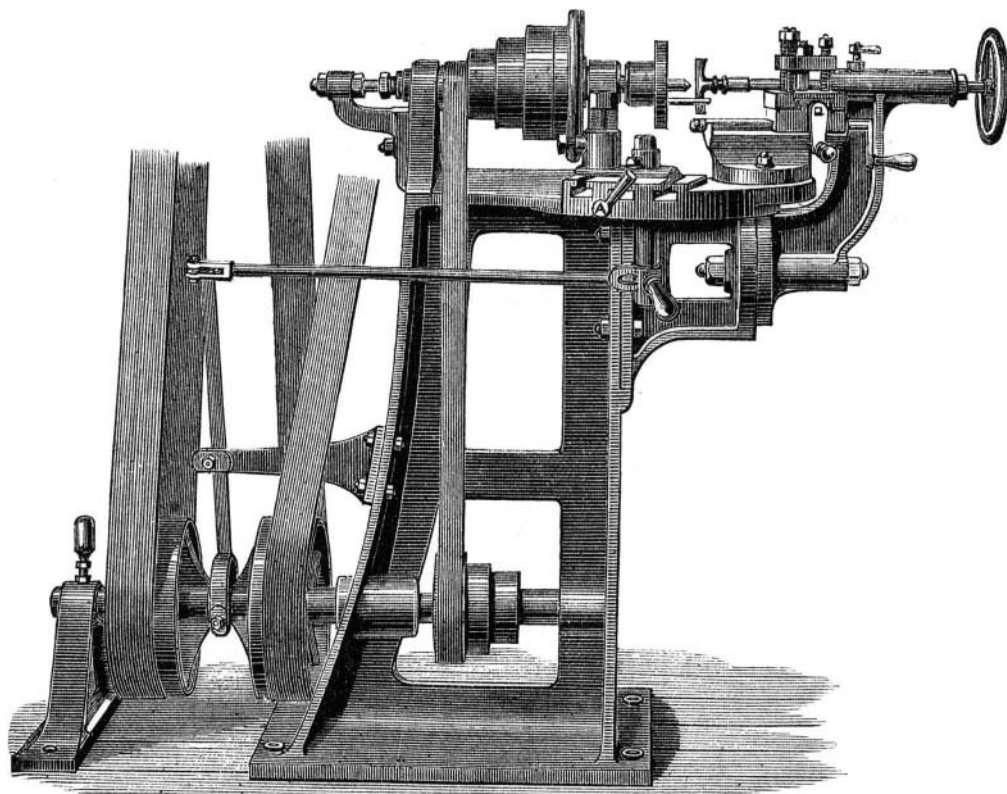
Dotting Pens.

An ingenious little apparatus for assisting in mechanical drawing, has been patented by its inventor, E. O. Richter, a watchmaker in Chemnitz, Saxony. In machine drawing, projections, and the like, the drawing of dotted, half dotted, or stroke lines is a mechanical task, the wearisomeness of which this apparatus is designed to relieve. An upright plate, sliding on the paper, has on its lower edge a toothed wheel catching in a bent lever which carries the pen point. A spring keeps the pen close to the paper. The wheel is kept in position by an adjustable plate. Wheels of various patterns can be used for producing a mixture of dots and strokes, the length and variations of which correspond to the indentations on the circumference of the wheel.

Nickelization.

In Plazanet's process a bath is used of 87.5 parts sulphate of nickel, 20 sulphate of ammonia, 17 citric acid, and 1,350 of water. A bath much used in France is formed of a solution of 4 parts of nitrate of nickel in 4 of liquid ammonia, and 150 water in which 50 parts of sulphate of soda have been dissolved. Using a moderate weak current the operation is at an end in a few minutes. There is no need to interrupt it by taking the objects out and brushing them. When the film of nickel is of sufficient thickness, the objects are withdrawn from the bath and dried with sawdust.

SHINGLE roofs can be made doubly durable by giving them a coat of thin oil before they get wet.



IMPROVED HAND AND SLIDE LATHE.—Fig. 2.

a pail, or small tub, leaving one side only, so that they can thrust their heads separately into it. For cattle and horses, encircle the tub with a lot of boulders as high as the top of it, or drive a half dozen strong stakes around it, letting them extend above it a few inches, to protect it from being pawed to fragments. If the tub is watertight, in case it should rain in it there will be nothing lost, as they will lick the salt water as readily as they will the salt; and should the water evaporate, the salt will remain. When sheep or neat cattle