

THE  
SCIENTIFIC AMERICAN,  
PUBLISHED WEEKLY

At 128 Fulton Street, N. Y. (Sun Buildings.)  
BY MUNN & COMPANY.

O. D. MUNN, S. H. WALES, A. H. BRACH,  
Agents.

Federhen & Co., Boston. Dexter & Bro., New York.  
Stokes & Bro., Philadelphia. E. G. Fuller, Halifax, N. S.  
S. G. Courtenay, Charleston. S. W. Pease, Cincinnati, O.  
Avery Belford & Co., London. M. M. Gardisal & Co., Paris.

Responsible Agents may also be found in all the principal cities and towns in the United States.

Single copies of the paper are on sale at all the periodical stores in this city, Brooklyn and Jersey City.

TERMS—\$2 a year:—\$1 in advance and the remainder in six months.

Useful Varnishes.

**ROSIN OIL AND GUTTA PERCHA VARNISHES**—A varnish of a very adhesive quality, and completely resilient to moisture, may be prepared with rectified, or raw rosin oil and gutta percha. Three parts by weight of gutta-percha of commerce are put into a vessel containing nine parts of raw oil of resin, obtained by the destructive distillation of ordinary resin; and this mixture is submitted to a temperature of 60° Fah., stirring from time to time, until all the gutta percha is dissolved. The varnish thus prepared is well adapted for coating ordinary articles, such as waterproof coverings for wagons, tarpauling, &c.

**ROSIN OIL AND GUM MASTIC VARNISH**—A colorless varnish may be manufactured from rectified essential oil of resin, mixed with from 1-10th to 1-6th of its weight of sulphuric acid, of a specific gravity of not less than 1.700, and the mixture is agitated, and the essence again rectified by means of a current of steam; by which means a colorless oil is produced. In this state, damar resin or mastic is dissolved in four times its weight of this rectified essence by a gentle heat.

A varnish of inferior quality may be obtained by employing oil which has only been once rectified, and which has not been treated with sulphuric acid. The proportions of all the ingredients may be varied according to the quality and the nature of the varnish desired to be obtained.

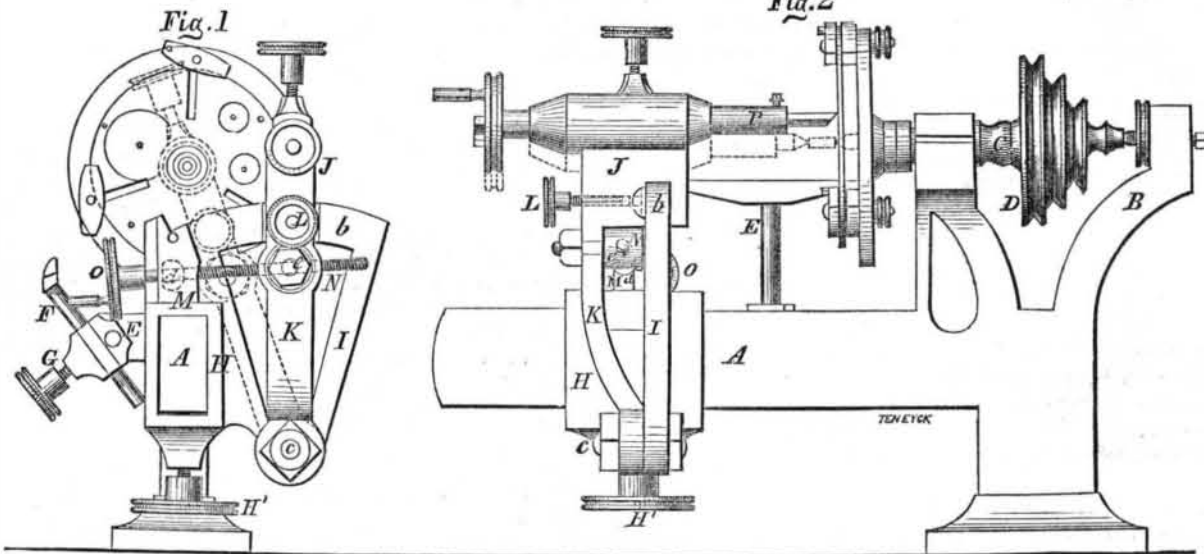
Turning Lathe.

On the 20th of last February a patent was granted to Wm. Stephens, of Richmond, Ind., for an improved slide rest in lathes, represented by the accompanying engravings, figure 1 being an end view of the lathe, and figure 2 a side view of it. The same letters refer to like parts.

This invention consists in the peculiar arrangement and attachment of the puppet head to the lathe, whereby it (the puppet head) may be adjusted so as to turn articles between centers, as in an ordinary lathe, and the puppet head be also adjusted so as to be used as a slide rest for facing off plates properly chucked in the lathe.

A represents the bed of the lathe, having the usual stationary head, B, at one end, on which a spindle, C, works in suitable bearings, said spindle being provided with a cone of pulleys, D; E is the rest which works on the rod, F, at the side of the bed, A, the rest being provided with a set screw, G, for the purpose of securing it at desired points on the rod, F; H is a rectangular socket or collar which works on the bed, A, which is also of rectangular form. To one side of the socket or collar, H, there is secured a sector frame, I. The socket or collar may be secured at any point on the bed, A, by a set screw, H'. J is the puppet head, the lower part of which is fitted on the arc, b, of the sector frame, so that it may move back and forth therein. To the lower end of the puppet head there is

IMPROVED TURNING LATHE.



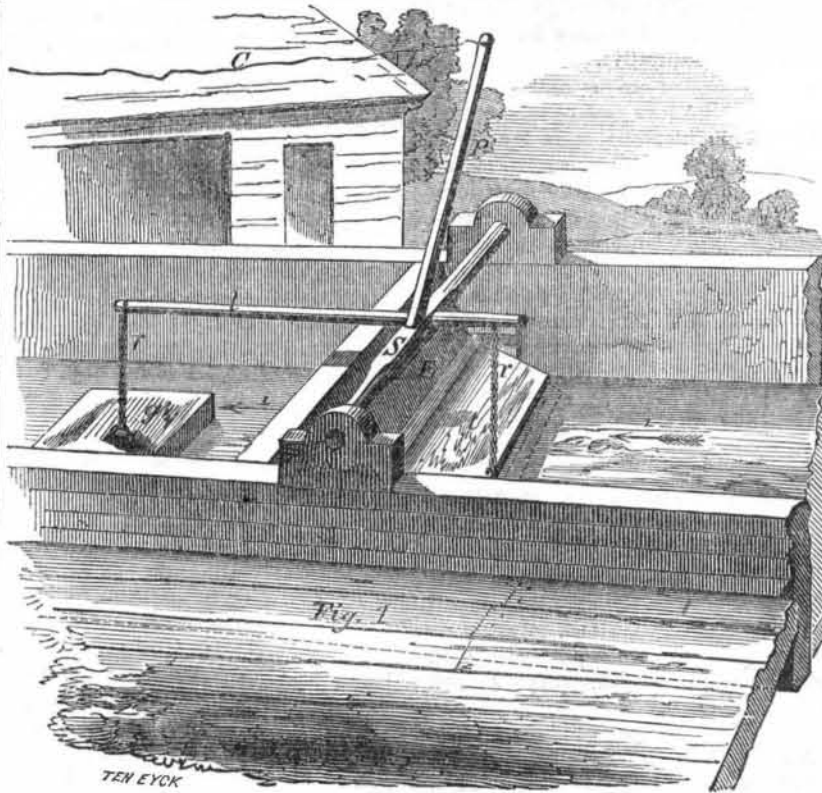
attached an arm, K, the lower part of which is secured by a bolt, c, to the lower end of the sector frame, the arm being allowed to turn on the bolt. L is a set screw, which passes through the puppet head for the purpose of securing it at any desired point on the arc, b. On the upper part of the socket or collar, H, there is a projection, M, through which a screw rod, N, passes, said rod, N, having upon it a ball, d, which fits or works in corresponding cavities in the projection, M. The screw rod, N, also works in a nut, e, attached to the arm, K, of the puppet head. The nut, e, is not permanently attached to the arm, K, but is allowed to turn on the screw rod, N; P is the mandril of the puppet

head, constructed and arranged in the usual manner. The inner end of the mandril is provided with a recess, so that either a point or cutting tool may be inserted therein. When the lathe is to be used for turning by placing the article between the centers of the two heads, the puppet head, J, by turning the screw rod, N, is brought in the position shown in dotted lines, and a point being inserted in the inner end of the mandril, P, the points of it, and spindle, C, will be in line, the puppet head is then secured to the arc, b, by operating or adjusting the set screw, L. The lathe may now be used as an ordinary turning lathe. But if plates require to be faced off, they are chucked in the usual manner on the inner end of the spindle, C, the

rest, E, is thrown back, and the set screw, L, is relaxed. Now, by moving the puppet head back and forth upon the arc, b, by turning the screw rod, N, the puppet head is converted into a slide rest, a cutting tool being placed in the inner end of the mandril, P, instead of a point. A series of circular plates may all be cut of the exact size upon a chuck by securing the puppet head on the arc, b, at the proper point. This lathe is valuable to watch makers, and other artisans. It is extremely simple, not liable to get out of repair, nor expensive to manufacture, and should therefore meet with general attention.

More information may be obtained by letter addressed to Mr. Stephens, at Richmond, Ind.

SELF-REGULATING WATER GATE.



The accompanying figure is a perspective view of a self-regulating water gate, for which a patent was granted to G. N. Todd, of Dundaff, Pa., on the 20th of February last. The arrows, 1 1, show the direction of the water running in a canal or flume of masonry work. E represents a solid back of masonry or wood work built across the canal, and in which is the throat or water vent of the gate or sluice, z. The back, E, is inclined outward, and the gate is represented in an in-

clined position, which, in most cases, will be the most convenient. The gate is a flap or swinging one, and is hung at the top by side gudgeons in proper boxes. Its lower end or sole is connected to a lever, l, by a chain, r. This lever has an axle fulcrum, S, which turns in journal boxes. g is a float attached to the back end of lever l, by another chain, r. The dotted lines show the space of the gate that is open. It will be observed, that according as the float, g, rises and falls, so will the gate,

t, be elevated and depressed, and thus increase or diminish the amount of gate opening. P is a pole or arm of any desired length, secured to the axis fulcrum of the gate lever. C is a cord or chain attached to P, and may be of any length. By drawing on this cord the gate, r, will be opened. The arm, P, is set to slant up stream when the gate is shut, so as to have it stand perpendicular when the gate is opened full head. It will be observed, that as the float regulates the opening of the gate by its gravity, and the position at which it is suspended on the lever, l, the amount of water desired to pass uniformly through the gate, can be regulated by the distance at which the float is hung from the fulcrum, S.

The construction and operation of this gate will be understood by all, and requires no further explanation.

Mr. Levi Decker, of Lenox, Pa., is now a partner with Mr. Todd in the patent. More information may be obtained by letters addressed to him or Mr. Todd.

Power of Cocoa.

Professor Johnstone, in his "Chemistry of Common Life," states, that by the use of cocoa leaf, the Peruvian Indians undergo the most incredible labor. He says; "With a feeble ration of dried maize or barley crushed into flour, the Indian, if duly supplied with cocoa, toils under heavy burdens, day after day, up the steep slopes of the mountain passes, or digs, for years, in the subterranean mines, insensible to weariness, to cold, and to hunger. He believes, indeed, that it may be made a substitute for food altogether."

Some of our cotemporaries state that J. Campbell, of Columbus, Ohio, has lined the axle boxes of locomotives with glass, to lessen the friction of the journals. Who will give us the result of his experiments?