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Improved Tobacco-cutter.

This machine has one of the most ingenious and simple attachments for feeding tobacco to the cutter that we have ever seen. It consists merely, of a toothed plate, A, working on oval centers, and fitted with springs which bear on the upper side of the oval center, and force the toothed plate in at the top. The top edge, B, is turned over; this edge strikes against an inclined plane, C, when the cutter is worked and is thereby thrown outward. This causes the lower or toothed portion to move inward, which it does, carrying the tobacco a certain distance, limited by the set-screw, D. The plate, A, is forced into the tobacco by the spring, bearing on the oval center. The dotted lines in Fig. 2 show the relative position of the feeding plate and the cutter, when the latter is down. There is, in addition, a follower, F, which confines the tobacco to be cut, and a side gage, G, to down it bearing. the cutter itself is operated by the lever, H, and cam, I, which is cast solid on it. The cutter slides in a frame, J, and has an even noiseless action. It will readily be seen that in working the handle the inclined plane, C, forces the lower toothed edge into the tobacco at every stroke of the handle, and that as it acts before the knife the tobacco is always ready to be cut. All adjustments are performed by the set-screw before-mentioned. The whole instrument is secured to a neat black-walnut base, and is both handsome and efficient.

A patent is now pending on it through the Scientific American Patent Agency, by Richard Smith. For further information address J. L. Walton, of Sherbrooke, Canada.

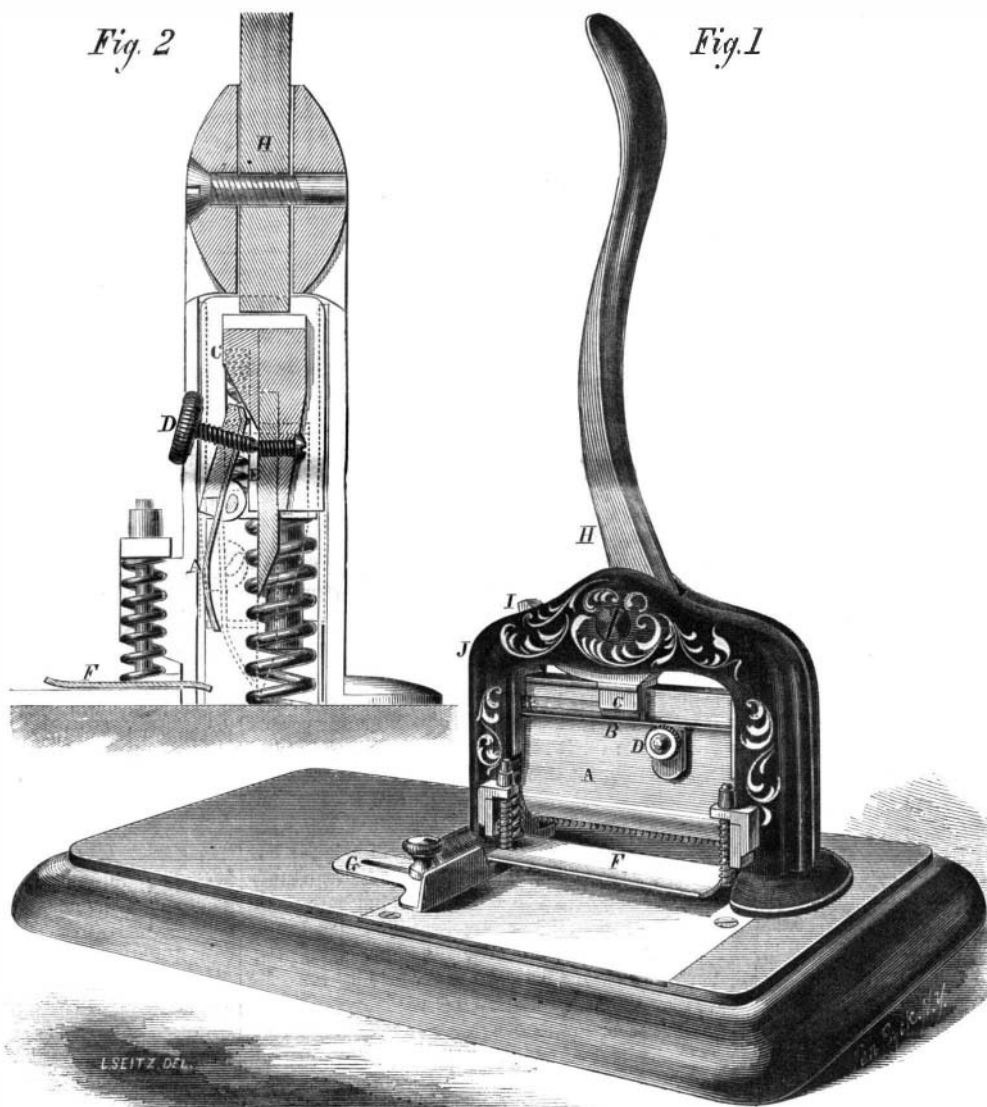
Raising Sunken Vessels.

When a steamer sinks in deep water there is great difficulty in raising her, from the dead weight of the boilers and machinery. Plans innumerable have been propounded for achieving the object, but none have been successful. The latest attempt was that tried to get the screw steamship *City of New York* off Daunt's Rock, which proved a failure. The *Baron Osy*, Antwerp steamer, was floated from the bank in Limehouse Reach, but she stood upright, and at low water was sufficiently exposed for advantageous operations. One cause of failure is to be looked for in the insuperable difficulty of securing the chains. If a paddle-wheel vessel lies on her beam ends, passing chains round her is next to impossible, if no measures are taken to pull her upright by steamtugs; for

the sponson boxes and wheels are in the way. The efforts made to save the *Chey Chase*, a valuable steamer, have been altogether of a novel character. A single row of piles was driven all round her, and outside of these a canvas sheathing was secured with bags of clay to keep the canvas firmly on the ground. When this improvised cofferdam was completed, five steam engines were set in motion to pump out the water, but after several days' exertion the water

planks could be let in and made water-tight in the ordinary way. For such a heavy vessel we suspect there is nothing better than the application of air. In theory, there is nothing more plausible than the plan of driving the water out of a vessel by air bags, through the action of force pumps. The drawback, however, to this admirable scheme, is the placing of the bags in the ship to be lifted. If the cargo is in the holds, or the mud and sand supply the place of

cargo, there is no room for the inflation of deep-sea or submerged balloons.—Where steam pumps can be effectively employed to expel water faster than it can enter through a leak, a ship must rise, but it too frequently happens that the damage is too extensive to permit of the water being kept under. The true secret seems to rest in distributing the buoyant agency over the entire hull. This can be best accomplished by the use of cylinders. On the coast, vessels are lifted off the beach by empty barrels, where a false bottom cannot be made. If one of these casks gives way, there is no mischief done, but if two large dummies or steamers are engaged to float a vessel, the failure of one is tantamount to a complete breakdown. Again, where large vessels are employed, the stress on the chains stretches, and then breaks the links; for the tension is out of proportion to the bearing strain. There are no better appliances for lifting than old tubular boilers, with the tubes taken out, and made water-tight. Cylinders made for the purpose would cost too much money; but metal tubes of any kind, if attached in sufficient numbers to chains round the vessel, and to balks of timber set under the beams, all



SMITH'S TOBACCO-CUTTER.

could not be reduced. The reason is apparent; for, as the water was pumped out, the exterior pressure from tidal influence would be sufficient to lift the sand bags, and so let in the water from below in quantity nearly equal to that ejected from above. If the bed of a river for about 260 feet was a dead level, with no inequalities, we could comprehend how this plan might perchance secure the end; but as it would be impossible to select a perfect plane in the bed of any river, we can hardly admire this engineering scheme. In theory it sounds very plausible, for if the cofferdam could be emptied for a few hours the leak might be patched up and the ship floated. Some other scheme will now have to be considered. Of course it is open to the owners of the *Chey Chase* to make a perfect cofferdam, and so put all risks beyond doubt; but will it pay? This is a mere question of figures. By driving a second row of piles,

bearing equal strain, would be the most likely plan to float the ship. These might be supplemented by air-pumps, inflating canvas, india-rubber, or composition bags; but to lift hundreds of tons the buoyant agents must possess strength. Air balloons have been tried on the surface, but they have burst, and have not been strong enough. A substantial iron tube admits of the chains being passed round it without fear of cutting through; and these are the right kind of things to employ if there are plenty of them and they are properly secured.—*Mitchell's Steam Shipping Journal*.

HOMBERG'S PYROPHORUS.—Mix equal weights of alum and brown sugar and stir over the fire until thoroughly dry; then put in a glass bottle and heat to redness without exposure to the air. It takes fire spontaneously when the air has free access to it.