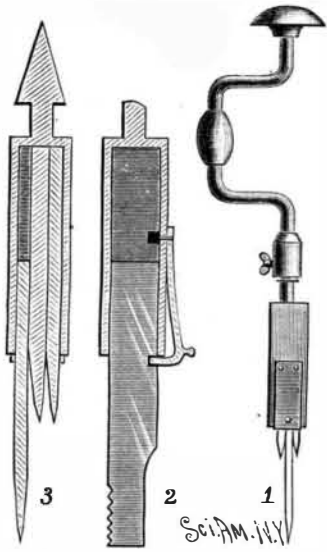


AN IMPROVED SCREW DRIVER.

The accompanying illustration shows a form of screw driver in which a series of notched bits is held extended from a socket or handle in position for use by means of a spring catch, Fig. 1 showing the device with a brace handle, and Figs. 2 and 3 being sectional views. This invention has been patented by Mr. Charles B. Morgan, of Telluride, Col. The shank of the casing is secured in the handle by means of a set screw, the ends of the bits projecting out of the casing, and being preferably formed with notches on one side by means of which a bit may be drawn up and secured in position for work, one means of holding the bits in position for work being a spring catch, on the side opposite the notches, engaging a notch on the side of the bit. By means of this device one size of screw driver can be readily changed for another, by simply releasing one bit and dropping it into the casing and drawing forth another bit and securing it in place.



MORGAN'S SCREW DRIVER.

IMPROVED PULSATORY WOOL WASHING MACHINE.

We give herewith an illustration of a new device for washing wool from which results have been obtained so important and valuable as to make the invention almost revolutionary in this branch of industry.

The washing of wool, as ordinarily conducted, is done in open basins, containing the alkaline solution, in which the fibers are subjected to harsh mechanical treatment with metallic beaters. It is a lengthy process, involving much time, considerable expense for labor and power, and a high temperature; moreover, the fibers are more or less dissolved, weakened, broken, and impaired. The cost of the plant for washing is also large, and forms a serious item in providing capital for business. The aggregate losses of wool in this country, under the present defective methods of washing, have been estimated at twelve millions of pounds per annum.

By the new system now to be described, all the foregoing losses and difficulties are obviated, and a more rapid, economical, and superior style of apparatus is substituted, from which remarkable practical results are now being obtained.

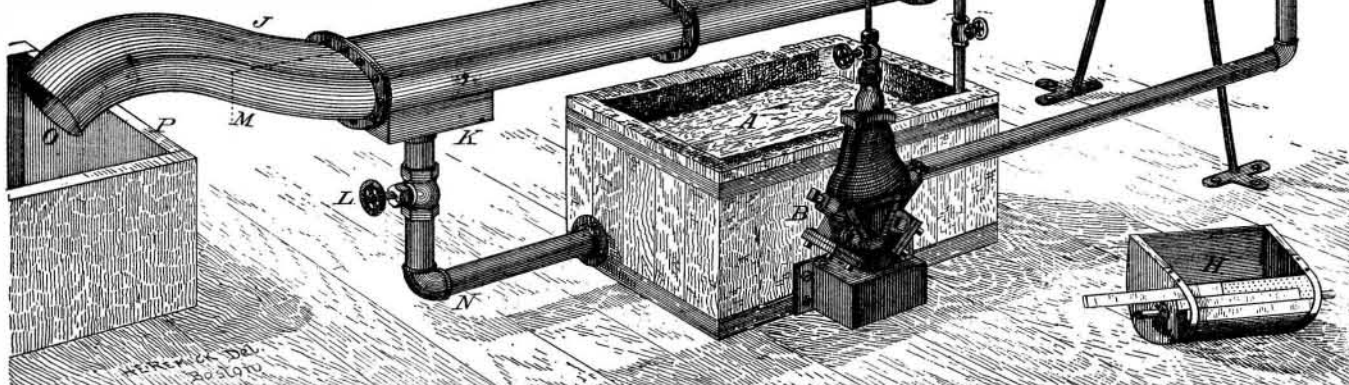
We will briefly describe the new device, premising, however, that its size, form, and capacity may be varied in accordance with the requirements. The wool is fed in at G, and there meets a current of the alkaline washing solution from pipe, C, by which the wool is carried into the tilting box, H, which tilts when its contents exceed the power of weight, I, and the wool and solution then drop into and pass along through tube, J. A pulsatory movement and action is thus imparted to the wool, which has a tendency to cause the fibers alternately to open and close, bringing the solution thoroughly into contact with the fibers and washing the same in the most effective manner. As the wool and solution thus intermittently advance through the tube, the cleansed wool is discharged at O into the receptacle, P, while the accumulated solution is drained off at K and passes by pipe, N, to tank, A, whence it is forced by pump, B, back into pipe, C, to be used again as before described. Besides the solution that goes through the tilting box before mentioned, a gentle and constant stream thereof is made to pass through the apparatus by means of side pipe, D.

Such is the effectiveness, simplicity, and rapidity of the operation that a single machine, of small size, costing only a few hundred dollars, and using a weak solution, will easily treat 60,000 lb. of wool per day; while an apparatus of ten times that capacity could be readily made at but little extra cost.

In conclusion we may mention among other advantages of this pulsatory system the following:

The intermittent supply is the only principle by which the flume becomes practicable. Its operation cleanses the flume from every particle of deposit.

It is adjustable, so that any length



IMPROVED PULSATORY WOOL WASHING MACHINE.

of treatment that may be desired can be obtained. After adjustment, it is perfectly regular, delivering each feeding like clockwork. The intervals of delivery exactly equal the intervals of supply. The wool fibers are not mechanically broken, are not weakened, are not dissolved. In fact, there is little or no waste.

The results of using this process show by actual tests a gain of from three to five and a half pounds of clean wool from every hundred pounds of grease wool, over wool treated in open basins, and the gain in quality even exceeds the gain in quantity.

Further information may be had by addressing the International Wool Improving Co., 624 Atlantic Avenue, Boston, Mass.

A NEW SCREW CUTTING DIE.

The ordinary solid die for cutting screws is slotted in one side to render it more or less adjustable, so as to vary the size of the screw within certain limits. These dies in the process of manufacture are extremely liable to check in the thinner parts forming the rim of the die, so that they are liable to break whenever any adjustment of the die is attempted; or if the die escapes this ordeal, the thin part, being nearly if not quite as hard as the cutting edges, soon cracks and renders it worthless.



Fig. 1. BRION'S SCREW CUTTING DIE.

Mr. Adolph E. Brion, the inventor of the improved die shown in the engraving, has overcome this difficulty by making the die of a steel disk provided with a periphery of soft iron, which readily bends enough to allow of any desired adjustment of the die. When the



Fig. 2.—SCREW PLATE WITH BRION'S DIE.

die is once adjusted, it stays in that position. This improvement is the subject of a recent patent.

Peter A. Frasse & Co., of 95 Fulton Street, New York City, will manufacture dies under this patent.

Substances Liable to Spontaneous Combustion.

Cotton-seed oil will take fire even when mixed with 25 per cent of petroleum oil, but 10 per cent of mineral oil mixed with 10 per cent of animal or vegetable oil will go far to prevent combustion.

Olive oil is combustible, and mixed with rags, hay, or sawdust will produce spontaneous combustion.

Coal dust, flour, dust, starch, flour (especially rye flour), are all explosive when mixed with certain proportions of air.

New starch is highly explosive in its comminuted state, also sawdust in a very fine state, when confined in a close chute and water directed on it. Sawdust should never be used in oil shops or warehouses to collect drippings or leakages from casks.

Dry vegetable or animal oil inevitably takes fire when saturating cotton waste at 180° F. Spontaneous combustion occurs most quickly when the cotton is soaked with its own weight of oil. The addition of 40 per cent of mineral oil (density 0.890) of great viscosity, and emitting no inflammable vapors, even in contact with an ignited body at any point below 338° F., is sufficient to prevent spontaneous combustion, and the addition of 20 per cent of the same mineral oil doubles time necessary to produce spontaneous combustion.

Patent driers from leakage into sawdust, etc., oily waste of any kind, or waste cloths of silk or cotton, saturated with oil, varnish, turpentine. Greasy rags from butter, and greasy ham bags. Bituminous coal in large heaps, refuse heaps of pit coal, hastened by wet, and especially when pyrites are present in the coal; the larger the heaps, the more liable.

Lampblack, when slightly oily and damp, with linseed oil especially. Tim-

ber dried by steam pipes, or hot water or hot air heating apparatus, owing to fine iron dust being thrown off; in close wood casings or boxings round the pipes, from the mere expansion and contraction of the pipes. —American Miller.

AN IMPROVED ROAD GRADER AND DITCHER.

The accompanying illustration represents a grading and ditching machine of simple construction, designed

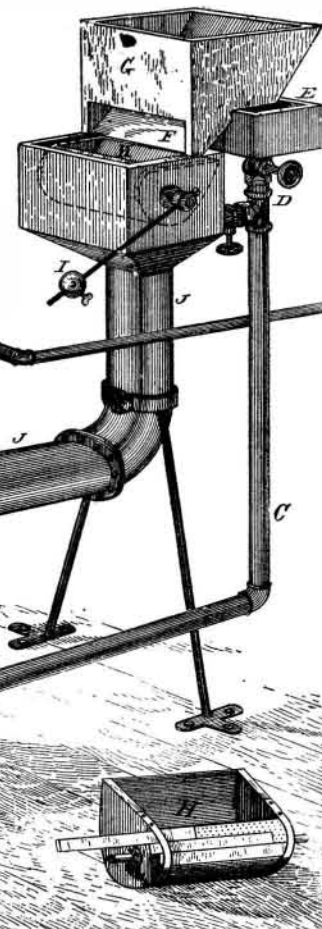


PERRY'S ROAD GRADER AND DITCHER.

to be light of draft, and which may be conveniently drawn along the road without operating upon it. It has been patented by Mr. Marlow F. Perry, of West Oneonta, N. Y. The body of the machine is triangular, and to the outer face of the side beams metal blades are secured, extending below the base of the frame, to act as knives or scrapers, the two blades uniting at the front to form a sharp vertical cutting edge. A draft-bar, pivoted on a pin, is projected through an opening in one side beam, the draft-bar being guided in its vertical movement by a bracket. Near the front of the frame a transverse rock-shaft is journaled, in which is pivoted a downwardly extending caster wheel, the rock-shaft being manipulated by a rearwardly extending lever adapted to be engaged by a rack on the rear cross-beam. Near the rear end of the frame, on each side, are forwardly swinging pivoted vertical levers, the lower ends of which are curved rearwardly, and each provided with a wheel. These levers are adapted to reciprocate in brackets, provided with teeth, whereby the levers may be adjusted to bring the wheels in contact with or elevate them from the ground. A platform is secured centrally and diagonally of the frame, to which the driver's seat is attached, in such position that he can readily manipulate the levers—to let the frame down upon the ground, so that its blades will operate as it is drawn along, or to lift the frame so that it will rest upon the rollers, to be conveniently moved from place to place.

Fast Railroad.

What is said to be the fastest time ever made between



Portland and Chicago was that of a special train chartered by Geo. W. Markle, a prominent Portland banker, to convey him to his father's deathbed. The train left Portland, Oregon, Tuesday at 8 P. M., and reached Chicago at 11 A. M. Friday, having made the run of 2,310 miles in sixty-three hours, an average of thirty-seven miles an hour. Between Portland and Huntington, a distance of 404 miles, the run was made in less than ten hours. The average speed between Cheyenne and Omaha was 49 miles per hour, and between Portland and Cheyenne 48 miles. The train cost Mr. Markle \$2,000, or \$32 an hour.