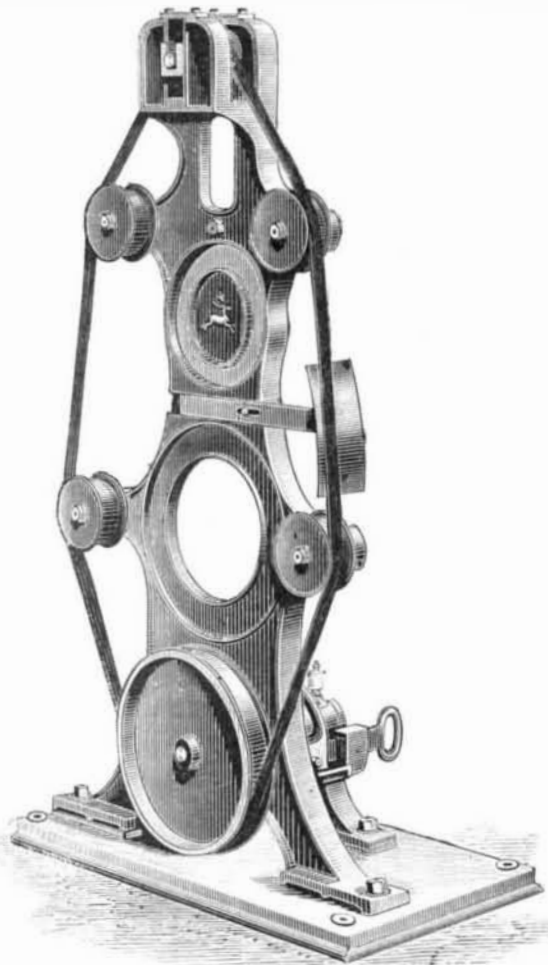


EMERY BAND POLISHING MACHINE.

There are many things which cannot be very well polished by means of grindstones, emery wheels, or any rigid tools in common use. Polishing by hand must be resorted to in the finish of many articles, in which that part of manufacture is the more costly. We need not mention any of the many purely ornamental articles to find illustrations of this. Most of the brass fittings for boilers have corners and compound curves, difficult to polish and sometimes impossible to get at with any ordinary wheel, or even an annular emery or polishing wheel. For work of this kind, the machine we illustrate herewith seems to recommend itself. It will be seen to consist chiefly of a standard provided with bearings, carrying a driven pulley, over which runs an emery band, which is also carried by five loose rollers, the upper one of which is supported in a movable bearing acted upon by spiral springs to keep the belt tight.



EMERY BAND POLISHING MACHINE.

The bands used are endless, and usually of leather covered with emery of a number suitable to the work to be done. Some bands are of tape specially prepared for the purpose. The emery coating is easily renewed by the user. The machine is made by Slack's Emery Wheel and Machine Company, Manchester, and seems to be generally applicable for polishing irregular and curved forms.—*Engineer.*

A NEW ANTI-FRICTION JOURNAL BEARING.

The accompanying engraving shows a novel anti-friction journal bearing which was first publicly introduced at the American Institute Fair, in this city, last fall, where a balance wheel, six feet in diameter, weighing 1,755 lbs., and provided with this ingenious mechanism, was run by a single thread of No. 40 spool cotton, instead of a leather belt. Since then the patentees have exhibited their invention upon railroad cars, wagons, machinery of various kinds, and, in fact, wherever there is circular motion. Upon railroad cars the decrease of friction is said to be so great that a single locomotive can draw a train of loaded cars, equipped with these bearings, as easily as it could draw the same number of empty cars provided with the ordinary journal bearings.

The device also effects a great saving of expense from the fact that it is operated entirely without lubricants, in fact they would only be a hindrance to it; and it is said that "hot boxes" are impossible where the device is employed. The officers of a single line of railroad recently stated that they had to deal with the annoyance of three thousand hot boxes in a single month.

The same difficulty is experienced more or less on ocean steamships and yachts, in mills and factories, and in fact, everywhere where there

is rotary motion. This device was invented by Mr. William Tucker, patented by Messrs. Tucker & Avery, and is manufactured by Mr. John G. Avery, of East Brookfield, Mass. We are told that the invention proceeded from a suggestion made by the SCIENTIFIC AMERICAN, some months since, in which we set forth the desirability of a device of this kind. The invention, which is shown in Figs. 1, 2, and 3, comprises a shell, *b*, containing hardened steel rolls, *a*, a journal, *A*, of hardened steel, revolving upon these rolls, and the whole working in a box, *B*, lined with hardened steel. The shell contains sixty rolls, no two of which are in line with each other, and as the journal revolves entirely upon these rolls, friction is decreased to the minimum, and no lubricants are required. The box and journal, also being of hardened steel, are very durable, and will far outlast those equipped in any other way. Rolls are also set in the end of the journal, thus decreasing the friction at that point.

We are informed that this bearing has been in constant use on a road wagon without lubricants, without showing any wear; also that a hand car on one of the principal railroads has been used eight months with the same result, and one of the Boston street railways has a car fitted with the journal that has run over 5,000 miles without appreciable wear. Mr. Avery has successfully applied the principle to engine slides and other sliding surfaces.

MISCELLANEOUS INVENTIONS.

An improved process of inlaying metallic ornaments in wood or stone has been patented by Mr. L. A. Amouroux, of West Mount Vernon, N. Y. It consists in working the alloy in a hot or melted state into engraved or indented portions of the surface to be ornamented, and afterward polishing all together.

Mr. Lyman R. Dexter, of Lancaster, N. H., has patented an improvement in sleds, which consists in a novel clamp for securing the runner to the upright. This device is an improvement on a clamp for which the same inventor received a patent in 1869.

An improved safe or vault, provided with air and water tight chambers entirely surrounding it, has been patented by Mr. Samuel A. Wilkins, of Victoria, Texas. The chambers are arranged so that they may be filled with water from the exterior of a building. The inventor also provides an ingenious burglar alarm.

Mr. John B. Belcher, of Charlotte, Mich., has patented an improved strap for rubber boots, which consists of a rigid ring connected with the boot leg by a strap. The inventor claims that the strap is stronger and more convenient than the ordinary ones.

Mr. G. G. Wright, of Winchester, Conn., has devised an improved rotary engine, having several novel features, which cannot be clearly described without an engraving. The object of the invention is to render the parts simple and accessible.

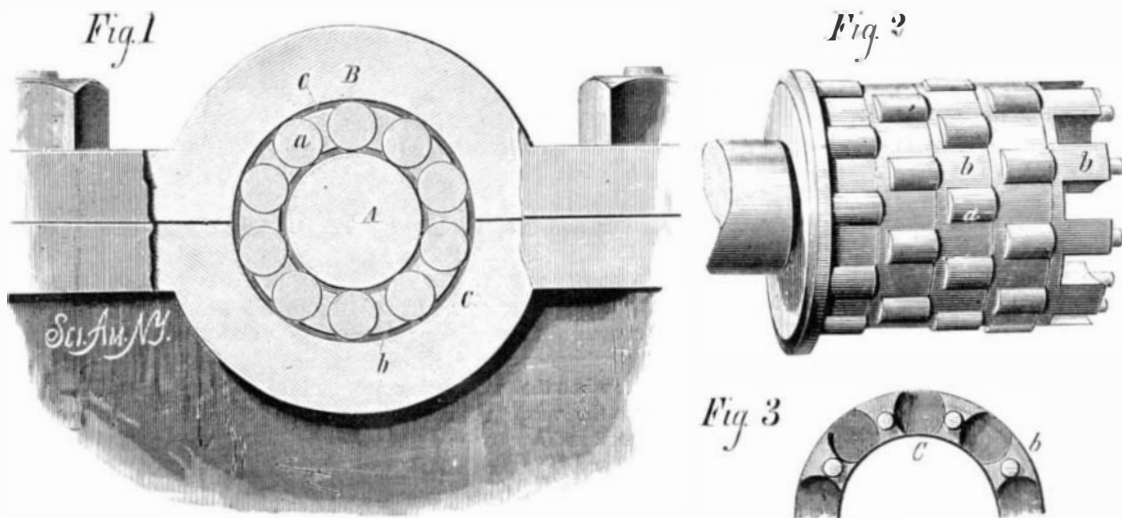
An evaporating pan having a corrugated bottom stamped from a single piece of sheet metal, the corrugations of which extend alternately from opposite sides, so as to form a tortuous passage for the liquid, has been patented by Mr. John L. Bleeker, of Cincinnati, O.

An improvement in riding saddles has been patented by Mr. William M. Herring, of Spring Hill, Texas. The pommel has a hollow neck, and is formed in one piece with the fork and web, and wooden filling pieces are provided, which complete the tree.

Mr. William H. Fix, of Moffatt's Creek, Va., has patented an improvement in axes, the object of which is to adapt the broad ax or hand ax for use by either a right or left handed person. The ax head is pivoted to the handle, so as to rotate in the plane of the axis of the handle.

An improved cover for the steps of wagons, carriages, and other vehicles for preventing the slipping of the feet in wet, muddy, and snowy weather, has been patented by Mr. William Mellon, of Philadelphia, Pa.

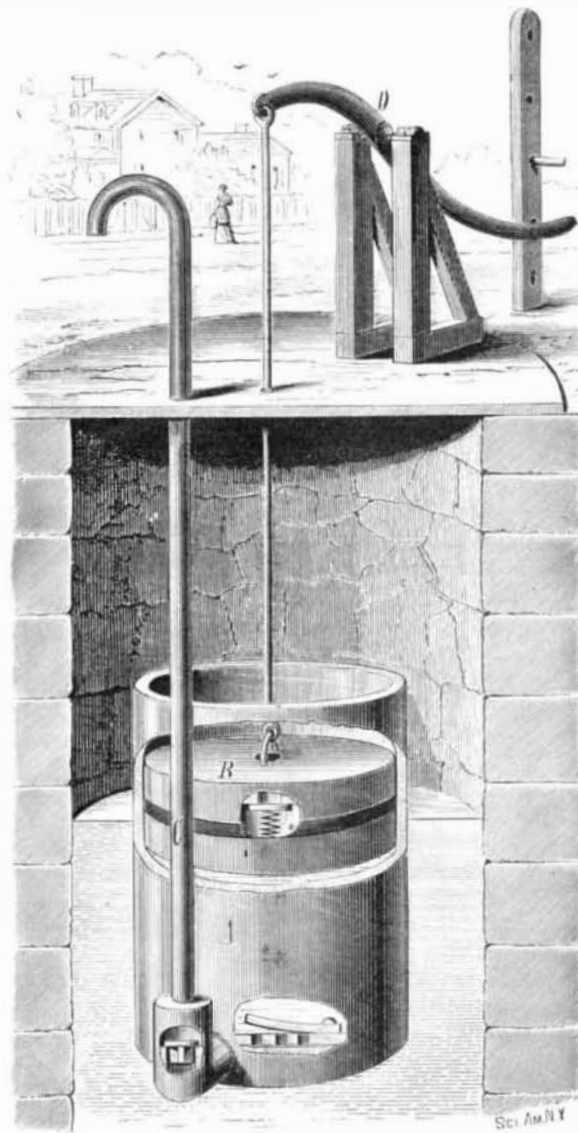
A runner stone—provided with a ventilating channel cut diametrically across the face, and having its bottom beveled upon opposite sides of the eye, away from the direction of the rotation of the stone—has been patented by Mr. George Helfert, of New York city.



AVEY'S ANTI-FRICTION JOURNAL BEARING.

AN IMPROVED WATER ELEVATOR.

The water elevator shown in the accompanying engraving is the invention of Mr. A. W. Coates, of Alliance, Ohio. It consists, as will be seen from the engraving, of a cylinder, *A*, which is wholly or partly submerged in the water of the well. A weighted piston, *B*, is fitted to the cylinder, and connected with a lever or handle, *D*, fulcrumed in a standard on the well platform. The cylinder is provided with valve covered apertures in the bottom, and also with a delivery pipe, *C*, having a check valve at its lower end. The piston is provided with a downwardly opening valve held up by a spring. This valve allows any water that may escape



A. W. COATES & CO.'S WATER ELEVATOR.

through the packing of the piston to return to the interior of the cylinder.

The pump is operated by depressing the handle so as to raise the weighted piston; the handle is then released, when the descent of the piston by its own gravity forces the water up the delivery pipe. The quantity of water raised may be measured by restricting the movement of the handle by means of the pins in the standard near the end of the handle. These pins also serve to hold the piston in an elevated position, so that all that need be done to raise a quantity of water is to release the handle from the pin which retains it.

Further information in regard to this invention may be obtained from Messrs. A. W. Coates & Co., of Alliance, O.

The South African Cable.

The telegraphic cable to connect the European and Asiatic telegraphic systems with Cape of Good Hope will be 4,000 miles long, extending from the Red Sea cable, at Aden, around Cape Guardafui and along the east coast of Africa to Port Natal, where it will make a junction with the present land line to Cape Town. The cable will be laid along the coast, the depth being moderate along that side of the continent, and the facility for repairing possible breakages has been carefully ascertained. The cable will touch at Zanzibar, Mozambique, Sofala, Delagoa Bay, and thence to Durban as the submarine terminus, from which point the land telegraph becomes available to complete the circuit to Cape Town. The cost of constructing and laying the cable is estimated at \$7,500,000. The line from Durban to Zanzibar is to be finished in July, and the whole cable by the middle of November.