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REVOLVING STEAM ENGINE.

The steam engine represented in our illustration is of an entirely novel form, and possesses the peculiarity of a cylinder which revolves with the flywheel. It is claimed that the device is both efficient and desirable, while it is clearly compact and simple in construction.

A is the steam cylinder, and B the flywheel. The steam chest is at C, and the exhaust extends through to D. E is the reversing lever, and F a cock for discharging condensation. The invention is so clearly shown that further detailed reference is deemed unnecessary.

The piston rod, it will be noticed, is attached directly to the wrist pin, consequently all the friction of slides, cross heads, and connecting rods is done away with. The motion of the cylinder is produced by placing it at half stroke on one side of the flywheel center. The journals are cast solid upon the cylinder, and both the latter and the flywheel revolve upon their own axes. The valve is stationary and placed upon the exhaust pipe. The steam passes under the face of the valve and then out of the pipe. The valve seat is movable, and if necessary both it and the valve can be removed for repairs by simply taking off the cap over the end of the chest. Within the latter, the steam port is always exposed to the steam. The crank pin has an oscillating motion of about $\frac{1}{8}$ of an inch to a six inch stroke and, it is claimed, is thus prevented from heating.

The lever is situated upon the exhaust pipe and is attached to semi-circular leaves, answering for a link. By turning it in one or the other direction, the engine can be reversed or started ahead; or by moving it up or down to the proper places, the lap of the valve can be altered while the engine is in motion.

The inventors state that they have had one of these machines in constant use for six years. Its cylinder is 3 x 6 inches, and it makes one hundred revolutions per minute, driving three printing presses. It has been ascertained by experiment that an engine with a cylinder 6 $\frac{1}{2}$ x 8 inches gives, by dynamometrical test, 14 horse power, 55 lbs. of steam, and 120 revolutions. Attached to a 24 inch burr millstone and a corn sheller grinding corn, a machine of the above dimensions under 55 lbs. of steam, made 250 revolutions per minute, with 430 revolutions of the stone. The detailed results given are very satisfactory, indicating large economy of fuel, although the boiler employed was of a disadvantageous form.

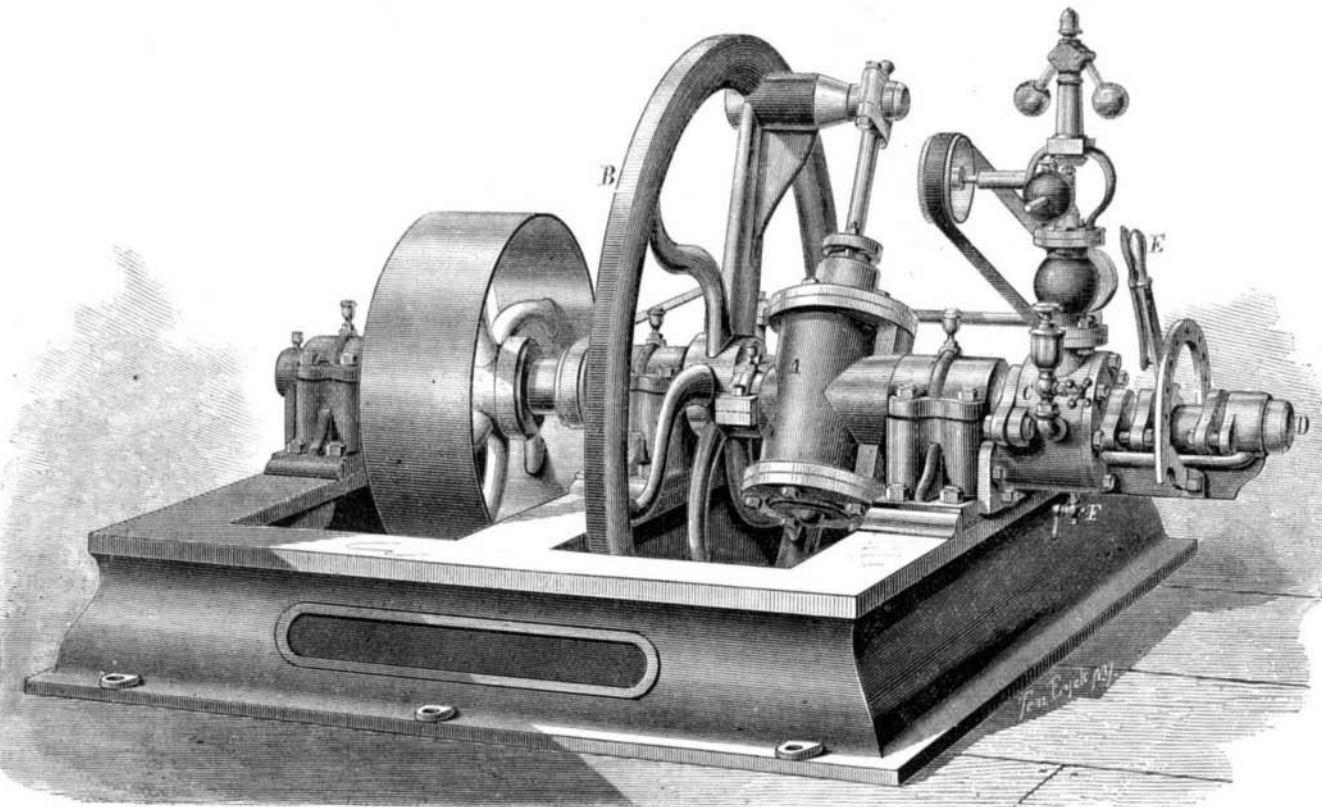
Patented through the Scientific American Patent Agency by Scott and Morton. For further information in regard to purchase of engines, etc., address Peter Black & Sons, manufacturers, Hamilton, Ohio; or in relation to rights, etc., address the patentees at the same place.

REVERSIBLE REST SINGLE WHEEL GRINDER.

In the machine here represented especial attention has been paid to providing a convenient and easily adjustable rest upon which to place the work, and also to supplying an accurate method of grinding long knives or other straight edges with emery wheels.

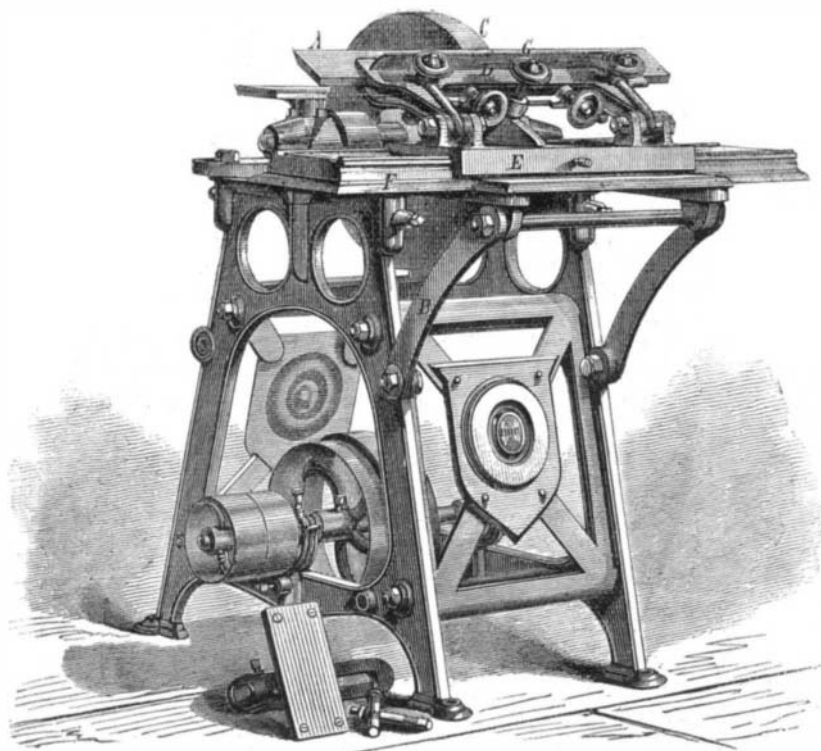
In the cut, A represents a knife being ground. B B are braces supporting an extension table, and C is a Tanite emery wheel. The knife is held in a clamp, D, which is ad-

justable by hand nuts and bolts to thick or thin, wide or narrow, blades. The angle at which the edge of the blade is ground is regulated by the hand bolt, G. E is the carriage or slide which is passed to and fro in front of the wheel, C, on the shears or bed, F. This machine is furnished with two small rests having each a surface 4 by 8 $\frac{1}{2}$ inches, also with a large rest or table 8 $\frac{1}{2}$ by 20 inches in dimensions. These surfaces are faced with accurately ground reversible plates of saw



SCOTT & MORTON'S REVOLVING STEAM ENGINE.

steel, and either rest can be brought to either edge of wheel at or below the center, or raised, if desired, 8 inches above the center of the arbor. They can also be adjusted on either side of the wheel at such point as is desirable. The general design of the machine, combining metal where strength is required, lightness where extra metal would be useless, and artistic taste with utility, will commend it to all mechanics.



THE TANITE CO.'S REVERSIBLE REST SINGLE WHEEL GRINDER.

When the knife-grinding attachment is removed, the table rest forms a true surface for holding gang or muley saws while grinding the teeth either to sharpen or "gum" them.

The machine is very handsome in appearance, and the high standing of the manufacturers is a sufficient guarantee of its efficiency. For further particulars address the Tanite Company, Stroudsburg, Pa. See advertisement on last page.

Scientific Research versus New Inventions.

At the recent meeting of the American Institute of Mining Engineers, Boston, Mass., Professor R. W. Raymond made the following remarks:

"I suppose we shall be told that mining and metallurgy are not sciences, but arts; and that we who pursue them occupy a place a grade below that of the disciples of scientific research, the seekers after truth as truth, for its own sake.

Gentlemen, I would do no injustice to any form of science, physical, mental, or moral. But it should be borne in mind that the absolute truth is what we never can attain; our utmost investigations give us only the truth as it is related to man. And it is truth for man's sake that we seek.

"It was my good fortune to be present at the farewell banquet given to Professor Tyndall by the scientific and literary men of New York, and attended also by a host of guests, comprising an unequalled array of the scientific and literary men of the United States. Aside from the relations between religion and science, which received perhaps an undue share of attention from the orators of the evening, the principal stress was laid on the

great value of scientific research, as distinguished from mere invention or applications of natural laws to useful ends. It is announced that Professor Tyndall has generously devoted to the encouragement of the former the entire profits of his American lectures. Far be it from me to detract one iota from the praise which is due to the earnest, honest, and disinterested inquirers who have made the secrets of nature available for the use of man. But when so much emphasis is laid upon that kind of physical investigations which promises no immediate benefit, as if it were a higher kind; as if truth lost something of its dignity when conjoined with utility; as if it were aristocratic to deal with abstractions, like atoms and ether, but vulgar to find out things that it happens to be worth money to know; then I feel justified in vindicating the dignity of the craft of those who work for money and for man.

"For what is the significance of the statement that a discovery is 'worth money'? Merely this, that it lessens human toil, refines or enlarges the product of toil, transfers toil from the ruder muscular sphere to the sphere of mind, which is the sphere of machinery. A machine, a mechanical or a metallurgical process, is the incarnation of the spiritual power, the symbol of man's control over nature, and every new one lifts us higher in the scale of potency, making the race more and more dominant over its circumstances. The money that a discovery is worth constitutes the general estimate of the good it will do. This estimate may be erroneous, the world may be short-sighted in the measurement, but the element of utility is not therefore an unworthy one. 'Not as the servant of Mammon,' says Professor Tyndall, 'but as the supporter and enlightener of the mind of man, would I have you take science to your bosoms.' Very good;

but minds supported and enlightened in that way will certainly make money, that is, they will save labor, or do more work with the same labor. The fact is that it is impossible to prevent science from being useful to mankind, unless it be locked up in the bosom of the student. This would be strictly seeking truth as truth, seeking merely for the sake of knowing; but our great philosophers would scorn such