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Drilling and Pumping.

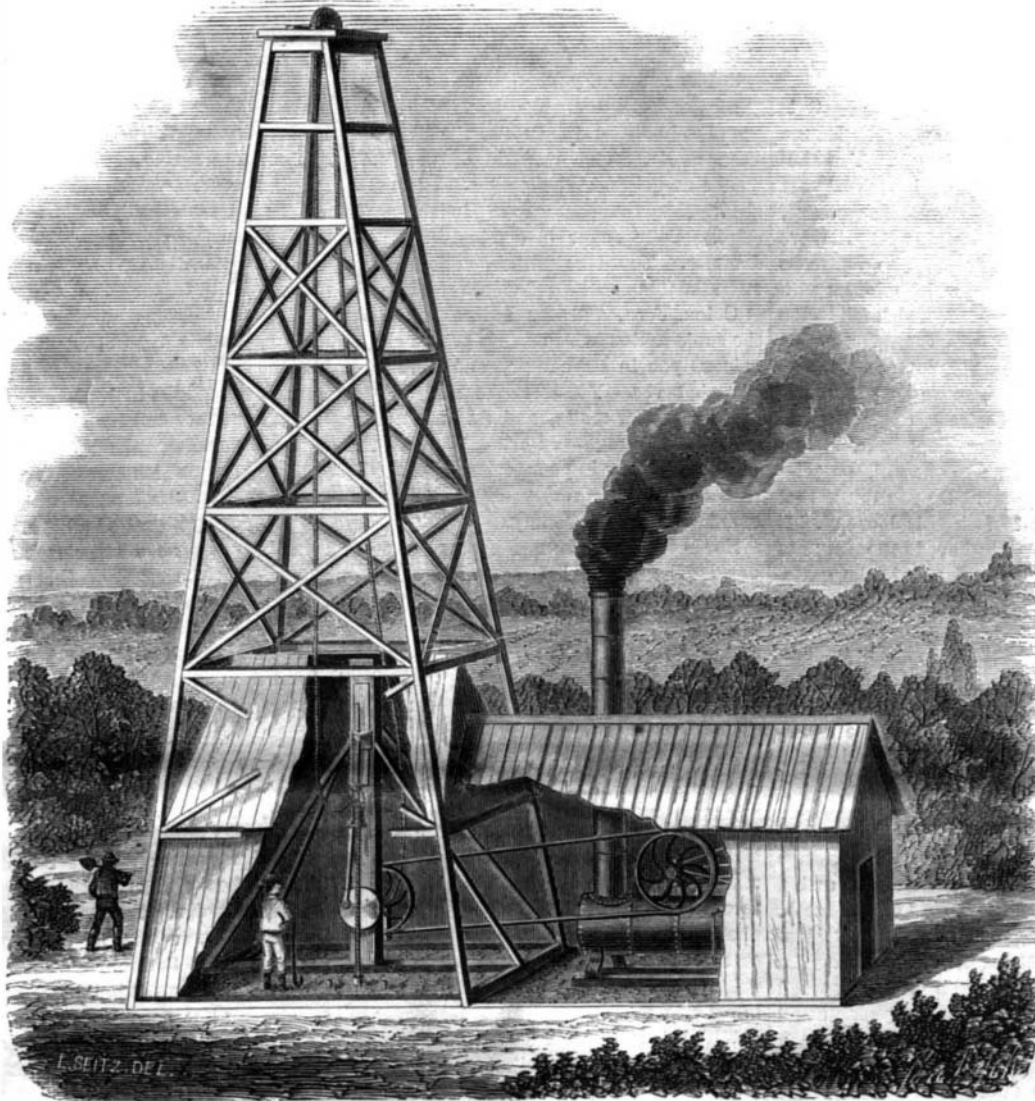
The framework of this machine consists of six lower sills—four forming the square, upon which the derrick is placed, and two cross pieces, one to bear the center post and the other a short post, as a center bearing for the shaft.

A slide, A, is fixed on the upper part of the center post, B, and upon it a crosshead, C, works, which is connected with the crank wheel, D. Attached to the crosshead are the temper screw and swivel rope clamps, which are so fitted that they can be worked by the action of the pitman. Between the center post and the inner short post is the band wheel, F, which is driven by belting from the engine. Upon the shaft outside of the inner short post is a cone coupling that can be worked so as to graduate the speed in hoisting or lowering the tools. The windlass is fitted with a pawl and ratchet which can be used when any work is to be done without the aid of the engine. The outside journal of the windlass is made to receive the right of the rope, for the purpose of taking out the twist during the operation of drilling. This gives it a continuous rotation and enables the tools to be worked with much more mechanical precision, thereby insuring a round hole. The sand pump is attached very easily.

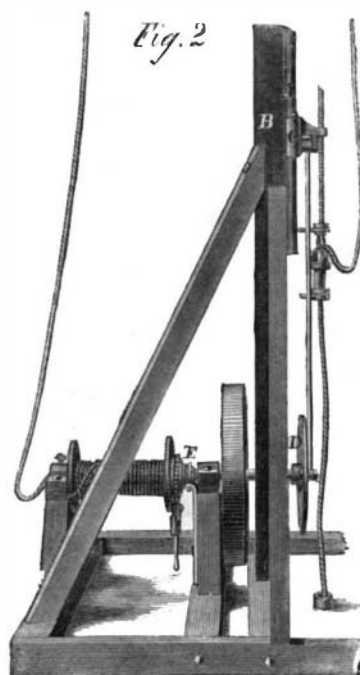
This machine simplifies the operation of drilling, rendering altogether unnecessary the use of the samson post, walking beam, bull wheel, bull-wheel rope, and several large sills. The advantage of dispensing with the use of these large timbers will be readily seen, for in many districts wood is so scarce that the delay in procuring them often causes a great deal of inconvenience and expense. It is equally well adapted for the use of wire rope, hemp cable, or pole tools. It admits of the rope being continually turned in the same direction, the rotary motion being accomplished by the action of the machine.

In the old system of drilling, the rope being turned at intervals, in opposite directions, it is impossible, especially when working at great depths, to be certain whether the tools have turned at all. Thus it often happens, from the tools merely working vertically, that "flat holes" so frequently occur.

The direct attachment to the windlass affords the drillers much greater facility for taking a strain on the rope or hoisting tools. With the old bull wheel, there is often much delay in adjusting the rope, and this frequently occurs when the power is most needed. The direct connection overcomes this trouble and inconvenience. The cone coupling enables the power



CLAPHAM'S DRILLING AND PUMPING MACHINE.



to be graduated in hoisting and lowering the tools. The band wheel being in the lower part of the derrick, dispenses with much strain and vibration. The

whole machinery is more compact, and can be perfectly inclosed, and made as comfortable as any workshop.

The negligence of allowing property in the shape of producing wells to be uninclosed, and so exposed by day and night to the danger of fire and other accidents, is too apparent to need any comment. Hitherto the works have required so much space that it would have been difficult to inclose them, but by adopting the new method, everything becomes more compact, and can be more easily brought under cover. In cold weather the derrick room can be heated by small pipes from the boiler, without any risk from fire. The importance of this fact cannot be too highly appreciated, as hundreds of wells are every winter stopped from working by the frost. The derrick room can also be lighted from the engine room, by a glass window being placed in the partition, which brings everything under view at a glance. In pumping, the work can be done with much less power than by the old method, a six-horse engine being able to do as

much work as a nine-horse by the old system.

It is often found that wells require to be worked energetically and with a rapid motion; but as a rule this cannot be done with a walking-beam, for when any speed is required, there is such an expenditure of power, and so much vibration and risk of a breakdown, that a slow motion is generally preferred.

One of these machines has been at work at the "Manor Wells," Story Farm, and one at the "Stirling Well," Tarr Farm, Oil Creek, Pa., since September last, and they are spoken of as having given the highest satisfaction.

Patented May 8th, 1866, by J. H. Clapham, whom address, at Messrs. Beebe, Son & Co.'s, 184 Fulton street, New York.

Nitro-Glycerin.

The April number of *The London Quarterly Journal of Science* copies from a German paper an extract in relation to the properties of this new chemical compound. Anything which tends to throw light upon this subject is of interest:—"Nitro-glycerin has been much lauded as an explosive agent for mining purposes. It is now stated that it freezes at a temperature of about 42° Fah., when mere friction will occasion it to explode. In one of the Silesian mines, an overseer was attempting to break a frozen mass, weighing about eight pounds, when it exploded, and the poor man was blown high into the air, and, of course, killed."