

piston 105 inches in diameter by 12 feet stroke, and upon a recent engineers' trial-trip, achieved the remarkable speed of 420 feet, or $17\frac{1}{2}$ double strokes per minute. We have no doubt that the engine will be able to add materially to this speed, as the machinery was entirely new, it being merely an experimental trip. This is not an isolated case, by any means. The *City of Buffalo*, formerly a passenger steamer upon Lake Erie, now dismantled for the want of trade, had an engine with a cylinder of 76 inches diameter and 12 feet stroke, which drove paddle-wheels 34 feet in diameter, whose floats had 31 inches face, were 11 feet long, and had from 36 to 40 inches dip— $19\frac{1}{2}$ revolutions, or 39 single strokes per minute. By a severe exercise of mathematical knowledge, we ascertain this to be a piston speed of 468 feet per minute. We remember these facts and figures very well, as at that time we were pretty much occupied in looking after the engine aforesaid. The beam weighed nearly sixteen tons, and was stopped and started thirty-nine times in a minute, working with great ease and certainty. The beam of a beam engine appears to some to be an insuperable obstacle to the general adoption of the class of engines to which it belongs; and its weight, momentum, velocity, &c., are charged heavily to its demerit. These theories, we fancy, are disturbed by the actual facts in the case, which are, that the beam is so poised and balanced on its center that the supposed shock of changing its line of motion is utterly neutralized; and as for the weight—that is supported by the framing, and is no more against the power exerted by the piston than the smoke stack. A beam weighing fifteen tons, or eighteen tons, can be moved through any portion of its arc of vibration, by the strength of a man; providing, of course, that the binders of the pillow blocks are not screwed up, and that the journals set fairly on the brass. The above cited cases of the speed of beam-engine pistons are all distanced by the extraordinary performance of the *C. Vanderbilt*, a Sound steamer, in her race, June, 1847. This engine is of 65 inches cylinder and 12 feet stroke, and on the occasion mentioned, attained to 540 feet, or $22\frac{1}{2}$ double strokes per minute. It is not at all uncommon or extraordinary to obtain a piston speed in beam engines, of 400 feet per minute, in this country; but the performance of the *Golden City*, we think, is the best on record, considering the size of the cylinder.

Since writing the above, we have ascertained that all the facts just mentioned are below the mark. The *Mississippi*, a large paddle steamer, having an 81 inch cylinder and 12 feet stroke, has made 24 revolutions per minute, the wheels having 36 inches dip, and attaining a piston speed of 576 feet per minute. The *Metropolis*, a large Sound steamer, having a cylinder of 105 inches diameter and 12 feet stroke, has made 20 revolutions per minute, and we think a higher number. The working beam on the *Mississippi* weighs fourteen tons; that on the *Metropolis* about sixteen tons. The engine of the *New World*—a side-wheel steamer 420 feet long, on the Hudson river, having a 76 inch cylinder, and fifteen feet stroke, has made twenty revolutions per minute, or forty single strokes. The *Richard Stockton*, however, has outstripped the whole fleet, and, we think, attained the highest piston speed for an engine of this class ever made in the world. We do not know the exact dimensions of the cylinder, but have been told it is between 50 and 60 inches, with ten feet stroke. The *Stockton* has feathering wheels, and makes 32 revolutions, or 64 single strokes, per minute; and has done this duty for years, having been built by Robert L. Stevens for the express object of testing the speed at which a piston could safely travel. This is the highest speed within our knowledge ever attained by a piston in an engine of similar size; if any other instances come to mind we shall place them on record. It would be difficult to point out any other class of marine engine of the same size as that in the *Golden City*, which could achieve $17\frac{1}{2}$ turns a minute, and keep it up as a regular duty. The standard of 250 feet per minute will have to be changed, and made to suit modern pistons, as the engines themselves stubbornly refuse to be controlled by any such snail-like movement.

The English papers state that all the winners at the later rifle matches were blue-eyed men.

PORTABLE ENGINES.

It is astonishing how mankind in general, and farmers in particular, obstinately adhere to the traditions and usages of the past. We allude at this particular time to the substitution of machinery for hand labor. While agricultural implements of all kinds are having a fair trial, we think it not amiss to say a word here in favor of the power that drives these machines—that much-abused animal the horse. We have assumed, broadly, that in most instances the horse furnishes the motive power. This assertion is, we believe, the fact in the case; and it is a state of things which might be changed for the better by the adoption of the steam engine. A machine of this class can be had for about the same price that a pair of first-rate horses will cost; with the advantage that it has, stored up within its brass and iron muscles, the force of three teams; and that it never tires, as flesh and blood does. Not only is this true, but the cost of keeping a pair of horses and that of running a steam engine of two horse power, is not to be compared for an instant. For it must be recollected that the engine will do the work in half the time required by an animal: that it consumes only when actually at work; and is not "eating its own head off" when the earth produces nothing, and man rests from the labor of the summer.

It is our opinion that in every instance where a stationary power can be employed, steam will be found preferable to any other that is used for farming purposes. With the same degree of intelligence that will keep a pair of horses from being ruined, or injured in body and health, the steam engine can be run and kept in order; and as the latter can be wheeled from place to place, there are but few localities where it could not be advantageously introduced. In rocky and hilly countries, in new land—where stumps spread out their roots, and neither use the ground themselves, nor permit the farmer to do so—the steam engine, aided by the proper tools, would soon subdue these intractable obstacles, and clear the way for the seed that comes after.

We think it would be a profitable speculation for some enterprising farmer to introduce a portable engine to his neighborhood, and let it out to his neighbors at a nominal price, so that its practical advantages would be manifested to the most prejudiced person. We are not so enthusiastic as some on this subject; we do not foresee the time when every farmer shall have his portable engine, just as certainly as they all have churns; for such a state of things would be unadvisable. But we do think that for all the rough work about a farm (and of this there is plenty) steam power would be much more efficient and economical than any other in use; and we hope to see sufficient enterprise manifested to enable us to chronicle the advent of many more engines than there are at present on the large farms about the country.

PERPETUAL MOTION.

The *Boston Journal* publishes a letter from a correspondent at Newport, Vt., who describes a "perpetual motion" machine, on exhibition at that place, and states that it is attracting great attention. Mr. Leach, of Vermont, claims to be the inventor. The writer says:—

"It is a simple wheel, runs on gudgeons, and is independent of any outside spring, weight, or power, as a propeller. On the same axle on which the metal wheel is fixed, is a band wheel, on which a band runs over a small pulley that drives a small circular saw. Set it on a table and remove the brake, and it will start itself and run with great velocity, driving the saw. It is the simplest thing in the world, though I cannot intelligibly describe it; but it is at once understood by the beholder. It will not, nay cannot, stop without a brake, as it is so fixed by means of balls and arms, that the descending side of the wheel is perpetually further from the center of motion than the opposite ascending. The most incredulous beholder here is at once convinced, on seeing it, that a wheel can be made its own motive power. The model runs on and runs ever. It is a small wheel, ten inches in diameter, with ounce balls attached to movable arms. Whether an increase in the dimensions of the wheel will increase its power in proportion, remains to be tried; but one thing is certain, it will make

Mr. Leach, who is poor, a wealthy man. It is no cheat, no humbug, no Yankee trick, but a stubborn and fixed fact; and ere long the world will be convinced that the principle of perpetual motion ever existed, and has now been discovered by a Green Mountain boy."

It is evident from the above that the fools are not all dead yet. When the laws of nature are so far reversed that water will flow up-hill, instead of down—when men can lift themselves by pulling upon the seats of their pantaloons—then, and not till then, will wheels manufacture their own motive power.

The above device is a cheat and a humbug. In principle it is the same as the "perpetual motion" of Willis, exhibited in this city about seven years ago, of which an engraving may be found on page 201, Vol. XI. (old series), SCIENTIFIC AMERICAN. A concealed bellows was the motor in that case, we believe. Several contrivances on the same plan were subsequently exhibited at Barnum's Museum. This Vermont show is probably one of them. Many people have been gulled by these perpetual motions; but we never knew that any of the "gay deceivers" who manage them, have made fortunes. It is to be hoped not, at any rate.

PRIZE EXHIBITION OF FARM ENGINES.

For several years past, much attention has been directed, in England, to improved steam engines for farmers; and an exhibition of such motors was lately held by the Royal Agricultural Society, at Worcester. On this occasion the engines were divided into two classes, namely, fixed and portable. Seven of the first order, none of which were to exceed 10-horse power, competed for prizes. Their power was tested with a friction brake, and a certain quantity of coal was weighed out to each. The amount of coal consumed per horse-power ranged from 4.88 lbs. to 15.32 lbs. per hour. The one which consumed the least coal gained the first prize of £15 (\$75).

No less than nineteen portable engines competed for prizes. They ranged from 4 to 12 horse-power, and were divided into three sections, according to their size. The consumption of coal, per horse-power, ranged from 3.59 lbs. to 13.28 lbs. per hour; and the prize, of £10, was awarded to the one which consumed the least fuel. In all the trials, the small engines consumed a proportionally greater amount of fuel than the large ones. The price of each engine was given in to the prize committee. The one which gained the first prize was valued at £230 (about \$115 per horse-power). The price of the smallest was £85 (a 4-horse power.) The boilers of all were of the tubular character, and each engine was so constructed, according to the conditions of trial, that it could be easily taken apart, and its valves and pistons inspected. The judges of these trials were, D. K. Clarke, C. E., inspector of machinery in the International Exhibition, and author of a work on railway machinery, G. V. Gooch, C. E., J. Stewart and J. Easton, railway engineers.

APPLICATIONS FOR THE EXTENSION OF PATENTS.

The following persons have applied to the Commissioner of Patents for the extension of their patents for a term of seven years:—

Method of fitting the Heaving Socket and Head of Windlasses.—Charles Perley, of New York city, obtained a patent on the 13th of November, 1849, for a method of fitting the heaving socket and head of windlasses. The said Charles Perley now prays for the extension of the patent.

Binder Pulleys for Belts and Brakes.—Mertoun C. Bryant, of Lowell, Mass., obtained a patent on the 13th of November, 1849, for an improvement in binder pulleys for belts and brakes. Caroline Bryant, executrix, of Lowell, Mass., now prays for the extension of the patent.

The testimony on the above applications will be closed on the 12th day of October next; depositions and other papers relied upon as testimony, must be filed in the Office on or before the morning of that day.

Looms for Weaving Figured Fabrics.—Moses Marshall, of Lowell, Mass., obtained a patent on the 11th of December, 1849, for a loom for weaving figured fabrics, and now prays for the extension of his patent. The testimony will be closed on the 9th of Novem-