AMERICAN ENGINEERS' ASSOCIATION.

[Reported for the Scientific American.]

On Wednesday evening, January 23d, the regular weekly meeting of this association was held at its room, No. 24 Cooper Institute, this city—Thomas B. Stillman, Esq., President; Benj. Garvey, Esq., Secretary.

The subjoined letter was received from Mr. R. V. DeWitt, of Albany:—

ALBANY, N. Y., Jan. 16, 1861.

Steamer *Simeon DeWitt*, of Cayuga Lake:—Horizontal cylinder, 50 inches in diameter, 72 inches stroke; steam pipe, 12 inches in diameter; steam drum or chest, 12 inches in diameter; nozzles or passages, 5 by 15—75 inches; disk cut-off valve, 8 feet from drum, cutting off at one-third stroke (26 inches); pressure on piston before cutting off, 9 inches; revolutions, 19. An oil cup was inserted about 12 inches from the end of the cylinder. Upon one occasion the cock of this cup worked loose, so that the weight of its handle opened it, when the following occurred, to which attention is called:—

Upon the commencement of the stroke, the piston starting from the end to which the oil cup was fixed, air rushed in through the cup, showing a vacuum, until the piston passed the oil hole. When the piston had passed, a strong jet of steam blew out, continuing until the cut-off valve closed, when instantly air rushed inward, showing a vacuum, until the piston had progressed about one-half the balance of the stroke (24 to 28 inches), when the steam again blew out, until the stroke was finished. Afterwards, by repeating the operation purposely, I found the same result invariably.

Upon describing the above to an intelligent North river engineer, Mr. Spencer, of the steamers *Rochester* and *Henry Hudson*, he immediately remarked that this explained the cause of a singular accident that occurred to him on a steamer on Lake Erie, under his charge as engineer. Upon one occasion he had been obliged to shut his throttle valve instantaneously, when to his astonishment, the packing of the lower flange of the valve box (between the valve and cylinder) was sucked in and the engine disabled, the vessel being critically situated at the mercy of a gale until he had repacked the joint.

It would seem as if the particles of steam must cohere in such a way that the piston travels off before the mass can expand.

Queries.—Is the watery condition of the steam the cause, and will superheating (drying) the steam cure this evil? How far do these phenomena affect the cut-off question? How far does the density of the steam affect the result? Does the indicator show the result as above? Does not the fact stated indicate that, to use a cut-off to the best advantage, it should close gradually and not instantaneously?

I would like to have the following questions answered by some or all of the advocates or opponents of the expansion of steam, according to the consequence of their theories, because I can give the practical answer to it.

Datum.—A boat of fair model, 100 feet deck, 18 feet beam, drawing 3 feet 9 inches; cylinder, 48 inches; stroke, 24 inches; air pump, 22 inches; stroke, 16 inches; boiler capable of maintaining, say 15 lbs. steam per square inch at full stroke, ultimatum; natural draft. The cylinder is removed, and in place of it is substituted one of 30 inches, or 900 cylindric inches instead of 576. Stroke of piston unaltered, and the nozzles of the new cylinder being the same as that of the old, and fitted to the same valve box, flanges, &c. In fact, no alteration except diameter of cylinder.

Query.—With the same amount of fuel per hour, steam cut off on the new cylinder so as to keep the pressure at 15 lbs. in the boiler, will there be any gain or loss? if any, what per cent?

(Signed) R. V. DEWITT.

A short discussion ensued upon the questions propounded in the above letter, and the cause of the phenomena. It was then, upon motion of Mr. Merriam, referred to the Committee on Science and New Inventions.

The subject of expansion was called up by Mr. Louis Koch, who asked if the same boilers, or the same quantity of boiler capacity, was used at Erie in the experiments upon the expansion of steam, in cutting off at one-third as in following full stroke.

Mr. MERRIAM—Yes; in all the experiments alluded to at the last meeting this was the case.

Mr. KOCH—Well, then, the test was not a fair one for expansion, as you have to keep as large a quantity of water boiling for a small quantity of steam used, and that takes fuel.

Mr. MERRIAM.—Mr. Koch's argument is very good; but it seems the contrary was proved by one experiment of thirty-six hours, when the cut-off was tried with one boiler instead of two. It was found, however, that it took more coal and water, and this was accounted for upon the idea that the engine took her steam in a more moist state.

Mr. KOCH—I cannot think that possible.

Mr. GARVEY—I think it would be better to defer the discussion upon this subject until the experiments at Erie have been finished, and we have the full results thereof. I would, therefore, move that the whole subject be laid over until that period.

These remarks received the approbation of the meeting, and the motion was carried.

A letter was received from Mr. Enoch R. Iverson, of St. Louis, asking for a copy of this association's constitution and by-laws, for the purpose of organizing a similar society at that place.

Mr. GARVEY presented drawings of his improved Automatic Boiler Feeder. It was duly referred to the Committee on Science and New Inventions.

A committee was selected by the society to prepare a memorial to be presented to the Legislature, relative to the employment of practical engineers to inspect the boilers of this city. That committee consists of Messrs. Stillman, Roeder and Koch.

The association then adjourned.

Erratum.—In the report of this association, Jan. 9th, the instrument submitted by Dr. Van der Weyde should have been designated a "Pyrometer."

HUMBERT'S IMPROVED WATCH ESCAPEMENT.

The oscillations of a pendulum having been found to occupy always the same length of time, so long as the length of the pendulum remained constant, this instrument was applied to regulating the movements of clocks; and the attention of mechanicians was directed to the devising of some plan for applying the same principle to regulate the movements of portable watches. This led to the invention of the balance wheel. A wheel is nicely poised and connected with a delicate spring in such manner that when the wheel

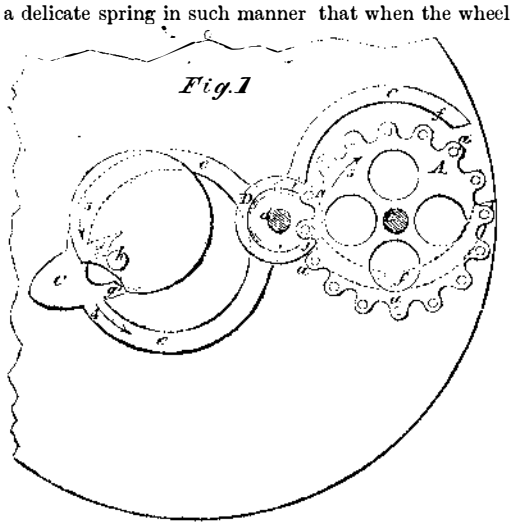

Fig. 1

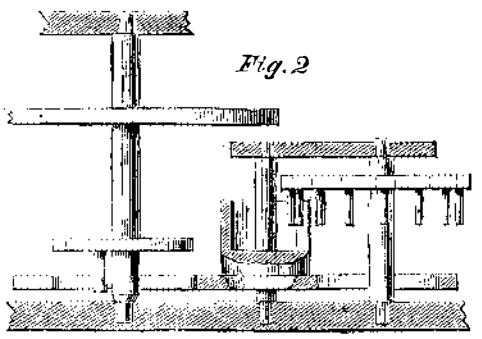

Fig. 2

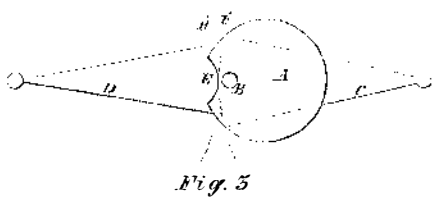

Fig. 3

is started with a rotary motion, the spring is coiled up with a constantly increasing strain which finally stops the rotary movement of the wheel, and draws it back in the opposite direction; thus giving to the wheel a swinging or oscillating motion, similar to the vibrations of a pendulum. It is found that the oscillations of the wheel, like those of the pendulum, are all performed in the same length of time, provided the size of the wheel and the tension of the spring remain constant. As the motions of the wheel would soon cease from friction, it is necessary to give it a slight push at each oscillation, and this is effected by the device called an escapement. Such an immense amount of thought has been bestowed upon this little piece of mechanism that it always surprises us when a new idea is presented in connection with it. And it would perhaps be impossible for us to have a more striking illustration of the absolutely inexhaustible field for improvement than the invention which we here illustrate; for it does present perfectly manifest advantages over escapements heretofore in use.

In the engraving similar letters indicate corresponding parts in all the figures. The escape wheel, A, is connected with the main spring by a train of gearing, so as to receive a motion in the direction indicated by the arrow, J. As this wheel revolves, it imparts through the lever, C, a pushing impulse, first in one direction and then in the other, to the balance wheel, B, Fig. 2. Below the balance wheel and upon the same axle is a smaller wheel which has the pin, *h*, projecting downward from its lower side and entering the space between the forks, *g* and *g'* that project inward from the hoop, *e e*, which forms a portion of the lever. C. Above the lever, C, and upon the same shaft, is a cylinder, D, which has a wide notch cut in its side, the two edges, *i* and *j*, of the notch being beveled for the action of the teeth, *a a*, of the escape wheel, A, thus serving as pallets. The forks, *f f*, of the lever C, are merely to balance the hoop, *e e*. It will be seen that as the wheel, A, turns forward in the direction indicated by the arrow, 3, one of the teeth, *a*, acting upon the pallet, *i*, causes the lever, C, to swing in the direction indicated by the arrows, 4 and 5, thus pressing the fork, *g*, against the pin, *h*, and pushing the balance wheel round in the corresponding direction; and as the balance wheel is drawn partly back by the balance spring, another pin, *a*, acts upon the pallet, *j*, impelling the lever, and with it the balance wheel in the opposite direction.

As each of the teeth, *a*, strikes against the cylinder, D, the motion of the scape wheel is stopped until the swinging of the lever brings the notch in cylinder, D, opposite to the tooth which is pressing against the cylinder, when the scape wheel is allowed to move forward the distance of one space between the teeth, *a a*, when it is stopped by the striking of the tooth against the opposite pallet. In this way the scape wheel is permitted to move the distance of only one space between its teeth at each oscillation of the balance wheel, and thus the movement of the watch is regulated.

In the escapement heretofore in use the forks, *g g'*, and pin, *h*, have been placed upon the side of the axle of the balance wheel nearest the fulcrum of the lever, while by this improvement they are placed upon the opposite side. A brief inspection of Fig. 3, by which the motions of the two are illustrated, will show that the change effects a considerable saving in the rubbing of the forks, *g g'*, against the pin, *h*; thus saving both friction and the use of oil, both of which it is very desirable to reduce to a minimum in the construction of watches.

The patent for this invention was granted through the Scientific American Patent Agency January 1, 1861, and further information in relation to it may be obtained by addressing the inventor, Prosper Humbert, Boston, Mass.

PHOTOGRAPHIC CARDS.—Card photographs in New York are now in the hight of fashion. In several of the leading galleries it makes the chief business, and in one so great is the demand that the actual work is at least a week behind the orders and the patrons make their applications and appointments a week in advance. Each photograph is multiplied by the dozen, so that it appears that photographs may soon become as common as newspapers, and we trust as useful. This card photographic fashion has also brought into commerce a neat photographic album, especially adapted to the cards, so that two or more may be displayed on one page, and hundreds in the whole book. This fashion is reasonable, and there is little doubt that it will become a permanent institution. We therefore advise our readers to be prepared for it, with suitable instruments and the albums.—*Journal of Photography.*

SENSIBLE ADVICE.—Professor Silliman, of New Haven, recently closed a Smithsonian lecture by giving the following sensible advice to young men:—"If, therefore, you wish for a clear mind and strong muscles, and quiet nerves, and long life, and power prolonged in old age, permit me to say, although I am not giving a temperance lecture, avoid all drinks above water and mild infusions of that fluid, shun tobacco, opium, and everything else that disturbs the normal state of the system; rely upon nutritious food, and mild, diluted drinks, of which water is the base, and you will need nothing beyond these things, except rest, and due moral regulations of all your powers, to give you long, happy and useful lives and a serene evening at the close.