give the same indications of the three motions found in the lightning; they are easily photographed; the variety is not so great as in lightning, but one has an opportunity here of varying the current in many ways.

The three motions, the reversing of the rotary motion in the continuous track of a spark, as well as the bead, are found in these currents as in lightning, and add proof that these currents and lightning are similar.

With one observation more, I close this paper. No doubt many have noticed what I am about to mention, but its frequency last summer attracted my attention. While travelling in Maine last August, I noticed that many of the telegraph and telephone poles, which were of the native white cedar, twisted as this tree always grows, had been struck by lightning, and that the current, travelling from the top of the pole to the ground, always followed the twist in the wood, often taking a groove out of the wood from top to bottom, winding once or twice around the pole, following the grain of the wood.

Whenever it struck a pine hole or tree, these being straight without twists, it ran down on one side, taking out the groove or tearing the bark down on one side only.

(A large number of interesting views of flashes of lightning and a few of artificial discharges of induced electricity were illustrated by means of the stereopticon, and fully described by the lecturer.—*Electrical Review.*

THE WORKING STEAM ENGINEER.

While it is true that in every line of manual labor, whether skilled or unskilled, genius and thought are recognizable, and the service of one man is enhanced beyond that of another, still the divergence from the plane of a general average, in most trades, is so slight as to make a standard of wages possible. The working steam engineer is an exception to this condition.

The street laborer may, by care and thoughtfulness, make himself of more intrinsic value to his employer, yet in a general sense his superiority is not materially felt, and a standard of wages for him is possible. Thus, also, in those branches of skilled employment where the labor becomes of a routine character, and where slight variation of subject is necessary, the same conditions exist.

This being the case, it is easy for combinations of tradesmen or labor to establish, by general consent, a code of wages for the guidance of its members. The further removed from that class of labor where bone and muscle are the only elements necessary for success, the more difficult it is to set any standard by which to estimate excellence or make an equalization of payment.

The medical profession may set a standard of payment, the mere physical act of making a visit being the basis from which payment is estimated; but if the absolute service rendered a patient were to enter into a discussion, the question of remuneration would be somewhat difficult to settle.

The mere fact that a man enters a shop and there toils for the allotted number of hours makes it possible to settle his wages by the standard of another man performing a like service; but when the service rendered is the product of thought and study, when the results of mental activity are thrown into the balance against muscular exertion, then the reward can only be measured by the profit given to the employer.

The greater and more varied the knowledge necessary to perform a certain line of duty, the greater the extreme from the inferior to superior talents; hence in proportion is the service rendered increased or decreased in value.

One of the leading English steamship lines, while having one established code of payment for its chief engineers, has a bonus fund, payable monthly to each chief engineer, which payment is determined by the success of the engineer and the absence of neglect on his part in the fulfilling of his duties. Thus each engineer becomes a competitor for this extra emolument. As the business of steam engineering takes to itself certain qualities of the professions it becomes necessary to gauge the emoluments by the same standard—that of especial fitness. To set a standard by which all attorneys were to be paid would at once close the doors to the chamber eminence, and no member of the legal profession would consider the incentive sufficient to warrant him in putting forth the energy necessary to advance beyond mediocrity.

In the employment of men, that class of labor that is purely mental commands higher price than does that class where only physical strength is wanted. One brain may design a steam engine, but more than one is necessary to build it. Hence, then, among brain workers, experience and originality are factors of success. Neither can we gauge a man's worth—commercially speaking—by lapse of time, for one man with frosty locks may have traveled a shorter distance along the highway of observation than his neighbor with half his years.

Certain qualities are always necessary to enable any man to succeed in his vocation, and a man's advancement above his competitor depends upon the magnitude of these qualities.

The working steam engineer is a man in whom must be found executive ability, and in proportion to his ability to execute is his service as an engineer enhanced.

Twin sister to executive ability is self-reliance. The working steam engineer must be endowed with keen perspicuity, so that he may be able to absorb generalities at a glance, and sufficient executive powers to carry out details with correctness and precision. One of the best and most reliable second engineers that we ever met—in marine service—was one of the most inglorious failures as a chief. He lacked completely the attribute necessary to execute. He was so devoid of self-reliance as to hesitate to back out into the stream at the beginning of a new trip any steamer upon which he was chief engineer. A thorough mechanic, and of more than ordinary education, he was in every way a first class man to carry out the details under the general planning of another.

Originality is the cradle in which eminence is nursed, for originality lifts men from the beaten track of the past into unexplored fields, giving the world new productions in science, literature and art. To succeed, the engineer must be original, and his performing a certain act must not be because someone else did it, but because from his own observation he knows it to be proper and correct.

Not only must the engineer be able to do for himself, but he must plan for others to do; he must be able to direct generalities and execute details; in fact, he must combine the practical and scientific to such an extent as to make it difficult to establish a general standard of payment for his services.—*American Engineer.*

PAINT stains that are dry and old may be removed from cotton or woollen goods with chloroform. First cover the spot with olive oil or butter.

Lignum-vitæ has been successfully used for blocks on piston cross heads, and is said to be superior to metal for that purpose, requiring less oil and never heating.