

steam is one of the principal advantages of the invention, in addition to the saving effected in repair and care.

In Fig. 3, our artist has depicted the application of the pulsometer on shipboard, showing a double arrangement whereby it may be used for freeing the ship from bilge, or for drawing sea water, in case of fire or to wash decks.

Another application is to the locomotive; the small space required by the machine rendering it easily located and thus convenient for filling the tender from roadside streams, in cases of necessity.

The device, which is covered by some thirty patents, is the invention of Mr. C. Henry Hall. It may be seen, and other information obtained, at No. 20 Cortlandt street, in this city, or at the manufactory of C. H. Hall & Co., corner Hudson and Sussex streets, Jersey City, N. J.

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Contents :

Table listing various articles and their page numbers. Includes 'American asphaltum', 'Locomotive, articulated', 'Log house of Norway', etc.

THE "GRANGES" AND THEIR OBJECT.

The agriculturist is, from the nature of his pursuit, necessarily isolated; and the greater the scale upon which his operations are conducted, the wider is he separated from the communities in which his market must be found.

It was a fact, evident to every thinking observer, that the state of affairs which existed in the agricultural districts of the west during last fall, resulting in the burning of corn as fuel rather than pay the high rates demanded for its transportation to eastern markets, was such as to necessitate speedy means of relief; while it lead many to the thought that, if reform could not be effected through individual effort, it might be gained by aggregation.

bandry is modeled something on the Masonic principle, so far as secrecy and the observance of a ritual is concerned, the object of ceremonial restriction being principally, however, to excite an interest and engender a more fraternal feeling among individuals.

These societies deal directly with producers, buying their supplies in quantities and paying cash. Contracts are made by agents with manufacturers to furnish various articles at the lowest price attainable.

The cost of buying being lessened, the organization has yet to reduce that of selling. At present, and indeed for some period past, the attitude of many of the Western railway corporations and the farmers has been open hostility.

Although no particular compromise has been suggested, the policy of the granges is toward negotiation and diplomacy rather than a continuation of the difficulty, toward securing as advantageous terms as possible from opposing capital rather than undergoing the losses of open rupture.

THE FLOWING OIL WELLS OF PENNSYLVANIA-- GREAT DECLINE IN THE PRICE OF OIL.

Within the past few weeks, a new section of the Pennsylvania oil region has been tapped by enterprising well drillers, and their labors have been rewarded by the opening of flowing fountains of the unctuous commodity.

The result of these new petroleum supplies is the overstocking of the market and the decline in price to the insignificant sum of 75 cents per barrel, delivered on the cars near the wells. At this figure the oil is almost given away.

The new flowing wells are in Butler county, Pa., a considerable distance south of Oil City. The new oil region is supposed to be quite extensive. The opening of every new section is the signal for the formation of a new city.

The principal use of petroleum at the present time is in the form of illuminating oil. Various attempts have been made to employ it as a substitute for bituminous coal in the manufacture of illuminating gas; and if this could be accomplished with economic advantage, the demand for crude petroleum would soon be equal to the supply, and steady,

remunerative prices might always be expected. Some of the difficulties connected with the conversion of petroleum into illuminating gas are suggested on another page.

The discovery of new uses to which this abundant article can be put likewise presents itself as an excellent subject for research.

The employment of petroleum as a fuel, in lieu of coal, especially for use on steam vessels, has been repeatedly attempted, but without economical success.

THE STUDY OF MATHEMATICS.

We have frequently advised our readers who are deficient in a mathematical education to devote some time to the study of this science. It is scarcely necessary for us to advance any arguments in support of this advice.

We have seen men who, in spite of strong efforts, had labored in vain from a lack of favoring circumstances. Not knowing how to study, and having no one to show them, all their time has been thrown away.

We suppose that our reader is thoroughly acquainted with arithmetic or the science of numbers, and that he is ready to commence the study of algebra, which may be called the generalization of arithmetic, operations being performed on general quantities, producing results that are general in their nature.

We say that the product of 4 multiplied by 6 is 24. Here we have two factors and a product. Now let us see if we can form a perfectly general expression of this nature. In this case, we would say that the product of two quantities is equal to a third quantity, and the next thing to do will be to represent this statement by an algebraic expression.

A teacher of great experience once told us that a very common answer to his question to a student: "Why is this so?" is: "The book says so, in such a place."

The student should exercise himself in finding out the reason why, in any particular case, and should receive no statement in the book on trust.

We frequently receive questions from correspondents who ask for rules that can be worked out by arithmetic, as they do not understand algebra. Frequently, as no data are sent, the question could not be answered without the use of algebra.

We do not mean for him to rest satisfied when he has finished the study of algebra; but our hints on this subject will apply with equal force to any other branch of mathematics.

It does not matter so much what text book the student uses as how he uses it; and as most mathematical works are