

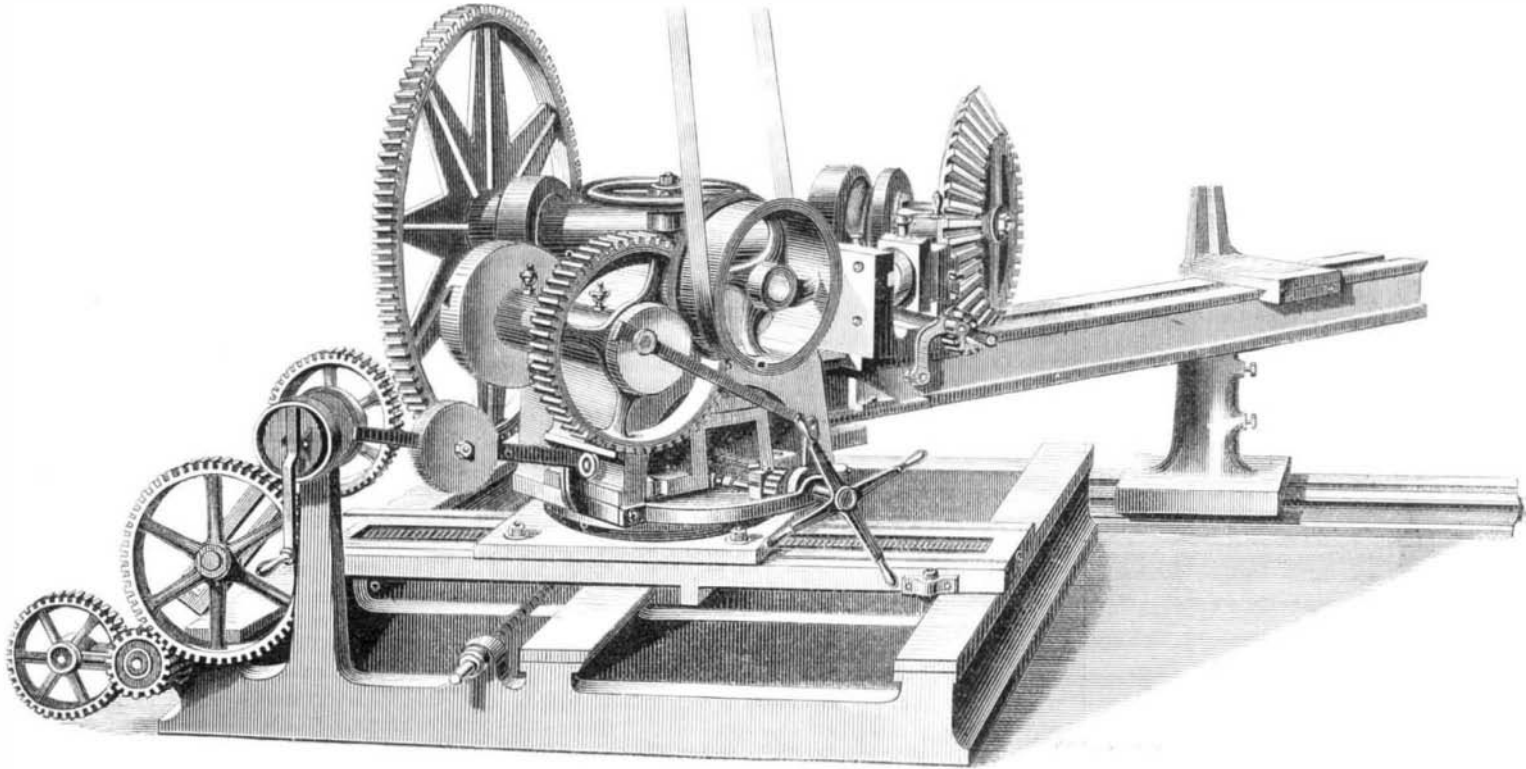
CUTTING GEAR WHEELS.

The Chemnitz firm exhibited at the Vienna Exposition a gear wheel cutter, of which we herewith present an engraving, which clearly shows the construction. The cutting tool is moved on a bed placed diagonally, and supported at the end by a movable rest. As the cut can be varied to any angle, wheels of any dimensions or bevel can be made by

A Scientific Inter-Collegiate Contest.

A college contest in oratory recently took place in this city, in which representative students of six institutions of learning participated. The exercises have excited much interest, and the successful competitors have been awarded substantial prizes. There is no question but that the public regards favorably these trials of intellectual strength among our

tion of laws of which at present we are very ignorant, coming athwart the globe on which we live, and a complete change taking place in the relations in which things even in the outward world stand at present, so that in the scriptural sense of the word there may be an end to the world, as there is certainly to be an end of our earthly life? To be sure, things have gone on for a long time in the same way, but is

**GEAR WHEEL CUTTING MACHINE.**

this machine; and an ordinary planing tool can be used, turning out gear work of the highest finish and accuracy. The machine is simple in construction; and it seems to be a useful tool, capable of many applications which shop practice will, from time to time, suggest.

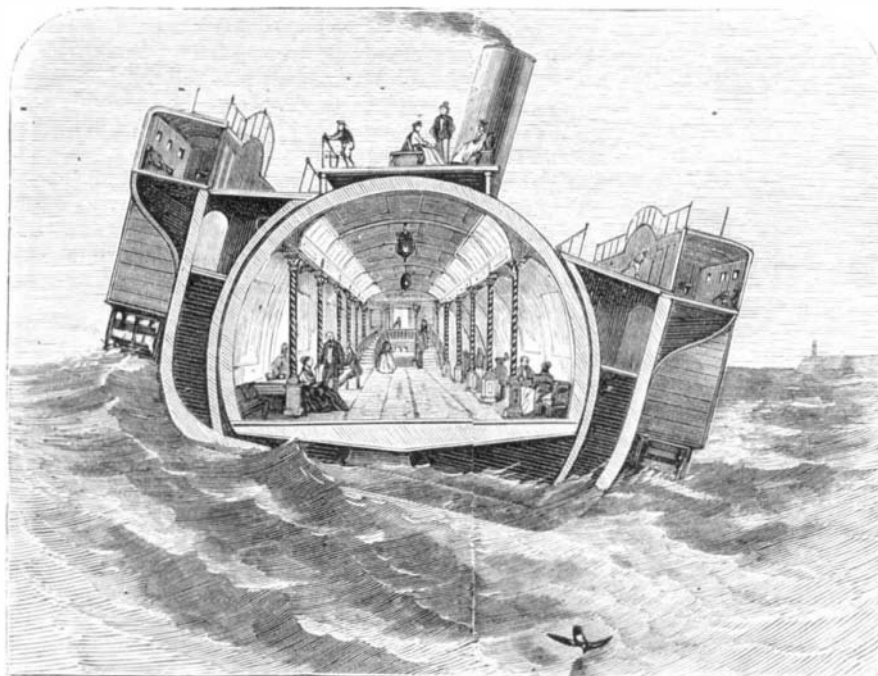
THE BESSEMER SALOON STEAMSHIP.

We illustrate herewith the interior of the steamer designed by Mr. Henry Bessemer, to defeat seasickness and give comfortable transit to persons in delicate health. Among her peculiarities are two pairs of paddle wheels and her freeboard of only 3 feet for 48 feet from each end. A sort of hurricane deck, 254 feet long, extends from bulwark to bulwark, 8 feet above the main deck. Her engines, nominally 750 horse, can work up to 4,600 horse power, which, it is calculated, will propel her at 18 or 20 miles an hour. The two paddle wheel shafts are 106 feet apart, and the swinging saloon, 70 feet long, is placed amidships between them.

Mr. Bessemer designed the apparatus for keeping the saloon perpendicular, an arrangement which possesses several original and ingenious features, which are fully described and illustrated on page 50 of our last issue. The new steamer is built from the designs of Mr. E. J. Reed, formerly Chief Constructor to the British navy.

If the inventor's hopes are realized, a very great stride in steamship accommodation will have been taken. As will be seen from our engraving, which represents a cross section of the vessel, the saloon is very commodiously and elegantly fitted up, and its great size will enable a large number of people to occupy it without suffering from the indescribable stuffiness and nausea inseparable from steamer cabins even of the largest usual dimensions; while for the great number of people to whom a sea breeze is the most enjoyable part of a voyage, the upper deck over the saloon will afford an agreeable promenade, as well protected from the effects of a rolling sea as the elegant apartment below.

The Bessemer started on a trial trip December 21, last. The day was foggy, and the trial was not completed; but the attempt was not altogether unsatisfactory, as it was found that, with a pressure of only 19 lbs., the engine making but 20 revolutions, a speed of over 16 miles an hour was made against a strong head wind. As it is intended to run her with 30 lbs. steam at 30 revolutions, a very good ultimate result may be expected. She answered her helm very readily, turning in a very small circle for a vessel of her length. Mr. Reed was well satisfied with her behavior, her fore deck being seldom covered with waves, in spite of her low freeboard. Another point was satisfactorily solved, namely the manner in which her two sets of paddle wheels worked together. The broken water from the forward pair of wheels was so slight in its action on the after pair that the two never varied more than one or two revolutions per minute from each other, thus showing a very small percentage of slip for the after pair of wheels. The vessel was constructed by Earle's Shipbuilding Company, of Hull, England; and further trial of her engines was in contemplation when our last advices left England.

**BESSEMER'S OSCILLATING SALOON STEAMER.**

repeated, if possible, by apparatus in presence of the audience.

The End of the World.

If the body's death seems to teach the lesson that modesty is becoming to the scientific speculator, what shall we say as to the prospects of that material frame which is beyond ourselves—the general orderly frame of the universe as we see it around us? People would suppose, from the way in which you hear men talk now, that there was not the slightest chance of any great organic change ever coming across the outward world in which we live. No doubt God works by fixed laws. No doubt the world goes on morning and evening, and summer and winter; but what reason have you to suppose that it will so go on to infinity? Have no great catastrophes befallen the world before now? Does not physical science itself speak of these catastrophes? What is there to prevent other catastrophes, produced by the opera-

that any proof that they are to go on in the same way for ever? You arise morning after morning in good health and strength, and seem to say to yourself for a time that this will last for ever; but one morning something happens, you cannot explain what; the best physician in the world cannot tell you what; but something has happened that lays you on a bed of sickness, and in two days sends you off to your grave a corpse. Will the experience of the reality of the way in which everything has gone on since you were young, till you have attained maturity, save you from that great mischance? Again, men for centuries had ranged over the mountains in Campagna; they thought that all would go on there, herds and flocks feeding and vineyards growing as they had done for centuries; and suddenly there was a strange sound heard, and a volcano burst forth, and the greatest philosopher of the age came to look at it, and lost his life while he was looking. But neither he nor any of the men who had speculated with him ever expected that these great cities were to be swept to destruction, and their beautiful pastures to become for a time an arid wilderness. I do not say such instances explain or tell us distinctly that such catastrophes will befall the whole globe; but at all events, I think they ought to make us modest, seeing that the wisest know so very small a portion of the laws that regulate God's creation. Surely we may not dogmatically assume that such catastrophes are beyond the range of possible or probable events. It is true, I say, things have gone on for a long time, and men say: "Where is the promise of His coming, for all things continue as they were from the beginning of the world?" But still with Him, with whom one day is as a thousand years, and a thousand years as one day, there may be changes maturing which no philosopher of the present or of any previous age has ever dreamed of, which will bring this great catastrophe to the globe, which will answer, on the whole outward creation, to something as great as is our passage from life to death, and what is beyond it. I do not think there is anything fanciful in such an expectation. I believe that a man, of that modest mind which is the characteristic of true science, will hesitate before he pronounces with any assurance that such a change may not come over the world as has been distinctly predicted in the Scriptures.—*Dr. Tait, Archbishop of Canterbury*

Protective Power of Clothes.

Clothes protect the body, not by keeping out cold, but by keeping heat in, or more correctly, by allowing through their interstices such ventilation that the nervous system may not be sensible to extremes in changes of temperature. If the first mentioned effect were produced by garments, then the material which is the most impervious to air would be the warmest. A kid glove, for example, would keep the hands more comfortable than thick woolen mittens. Just the reverse, as is well known, is the case.

Dr. Pettenkofer states that equal surfaces of various materials are permeated by air as follows, flannel being taken as 100: Linen of medium fineness 58, silk 40, buckskin 58, tanned leather 1, chamois leather 51.