fuel on the prairies as it is to import coal or grow wood, certainly off the lines of railway.

An acre of corn can be raised for about $6, including the rent of the land. Fifty bushels of corn will weigh 3,500 pounds, or equal to a ton and three-quarters of soft coal. This, at 15 cents per bushel (which is as much as corn was worth on the farm away from railroads last winter), would be as cheap for fuel as soft coal at $4 per ton. Two bushels of corn will make a fire which will keep a family warm all day, even in very cold weather.

Some recommend raising sunflowers for firewood, but they are not as good as corn. Nor need the talk about burning corn create any reluctance to removing to regions where they have to burn corn for fuel. It can be raised in one-tenth of the time and at less expense than timber can be raised for the same purpose, and the farmer may as easily and as conscientiously plant corn for fuel as sunflowers or trees. The *Register* is of the opinion, however, that, though the prairie farmers will occasionally have to burn corn to keep warm, they are not likely to choose it as fuel when they can get coal or wood.

HOW TO GET RID OF FOUNDLINGS.

The methods adopted by the almshouse officials of Philadelphia for getting rid of unwelcome babies appear to be complete and efficient to a degree never before approached in a modern public institution. The death rate is precisely 100 per cent. As the president of the city board of Guardians of the Poor frankly put it, when he protested against sending any more unfortunates to the almshouse: "All of them die. None of them live; and never have we raised a child out there."

The assertion seemed incredible, but an examination of the records of the institution found it to be true. It was discovered that few if any foundlings survived the almshouse treatment more than four months, and none lived more than six months. During the year 1880 there were brought to the institution 66 foundlings, of whom 30—of course the prettiest and apparently healthiest—were taken out for adoption. Of the 36 which were left all but one died within four months, and that one lived four months and one week. Nearly all died within four weeks of the time of entry.

Charges have been preferred against the management of the children's department of the almshouse by the society to protect children from cruelty, and at this writing the matter is still before the grand jury.

At the request of the president of the Board of Guardians, the condition of the foundling ward was investigated by the obstetrical staff of the almshouse, who attributed the terrible mortality to bad food, impure quarters, bad air, and insufficient attendance. As given in the *Record* the report mentions that in former years there were twelve resident physicians in the institution, thus obviating the necessity for the frequent change to which the foundlings are now subjected in their medical attendance. Under the present rules of the almshouse the number of resident physicians is twenty-three, and these are young physicians, fresh from college. As these physicians are rotated every month, the infants, who should have a permanent medical officer over them, have a new physician every four weeks. The report is also understood to say that the infant ward is ventilated from a cellar room, which is used as a drying room at high temperature for the pauper clothing, so that the foundlings are compelled to breathe a vitiated atmosphere; also that they are seldom if ever taken out of this room except during the summer time. It is also said that the medical staff connected with the almshouse has from time to time protested in vain against the food supplied; that patients have actually suffered from scurvy brought on by the food, and that the milk supplied has often been not only unfit for use, but that no attention has been given to repeated warnings that this was the case.

No doubt the official baby killers will to a man testify that everything has been done by them to discourage the perverse habit of the foundlings; and that it is only by the most painstaking carefulness that the little wretches have been kept alive so long on the average. But there will remain with the people at large a distressing sense of dissatisfaction with the results of the official tender mercies of the City of Brotherly Love. As a rule foundlings are not the best possible material for making men and women out of; still a death rate of 100 per cent in six months is a little too comprehensive to be accepted with composure, even when we are assured that "the subject has been one of serious study with the doctors of the almshouse for sixteen years," during which time, it is admitted, they have been unable to rear a single foundling in the institution. Many of those who are taken away and adopted live, but none of those survive who remain in the institution.

EXTINGUISHING PETROLEUM WITH CHLOROFORM.

The following experiments made some time ago are again published, in the hope that some of our readers may be induced to study the subject further and develop useful results.

The doctrine of the inflammability of chloroform has been generally accepted by chemists up to the present time. M. Würtz, in his great dictionary, states that a cotton wick dipped in chloroform will burn. M. Moigno has been making experiments which seem to point to a completely opposite doctrine.

If chloroform—$CHCl_3$—be submitted to the action of heat, another chloride of hydrogen is formed, an equivalent of chlorine and an equivalent of carbon are set at liberty. This proceeds from the reaction indicated by the formula, $CHCl_3 = Cl_2H + Cl + C$.

M. Moigno has established that pure chloroform, free more particularly from any trace of alcohol, does not burn. He has established, besides, that pure chloroform, mixed with inflammable liquids, destroys their inflammability. His experiment was an easy one to perform, and began by mixing petroleum and chloroform in the proportion of five parts of the former and one of the latter. This mixture will not burn with a wick. It is both uninflammable and incombustible, that is, until the greater portion of the chloroform has been volatilized. To give the experiment greater effect, it may be varied in its operation as follows: Let a liter of petroleum be spread over a surface of 10 c.c., set the liquid alight, and when it has well taken, pour 50 cubic centimeters of chloroform into the mass. The petroleum is at once extinguished. If, now, an attempt be made to rekindle the petroleum by any inflamed body the latter goes out on touching the mixture.

The discoverer of this curious property of chloroform, extending the scale of his experiments, next poured 4 liters of petroleum upon this same surface—10 c.c. This liquid mass, having a depth four times that of the amount first experimented on, was well lit, and was then successfully extinguished by the same quantity of chloride of hydrogen as before—50 cubic centimeters.

M. Moigno then proceeded: 1. To raise the vapors of explosive gases. The greater number of these mixtures lost their inflammability. 2. To expose a wick saturated with chloroform to a strong flame of alcohol. The flame became smoky, and an intensely opaque vapor of hydrochloric acid —HCl—was formed. 3. To pass the vapor of boiling chloroform into a good flame of alcohol. The flame is extinguished.

Practically what can one make of these experiments? Less, perhaps can be made of them in the way of process than in that of principle. They point to the possibility of the extinction of the obstinate and dangerous flame of burning petroleum.

The principal difficulty in this application of chloroform will consist in its high price, chloroform costing from ten to fifteen francs the kilogramme. This difficulty will, doubtless, prevail against the adoption of the new principle for the extinction of petroleum fires in large towns, where less costly means are at hand, but it will not hinder its adoption in a case considered till now almost beyond the reach of help—fire on board ship. In this direction M. Moigno thinks there is fair room for experiment and reasonable ground to hope for satisfactory results. If the indications given by laboratory experiments lead to good practical results an important problem will have been solved. It is not impossible to conceive that a ship could be furnished with a supply of chloroform, so stored as to admit of projection to any point where fire broke out. However considerable its first cost, this, as the chloroform keeps good from voyage to voyage, would be small for each one; and in presence of the terrible disasters it is capable of preventing, the question of cost disappears altogether.

PLEA FOR A GOVERNMENT PERPETUAL MOTION.

We publish in another column an extract from the remarkable report of Chief Engineer Isherwood to the Secretary of the Navy, in which he strongly urges, in fact almost implores that functionary to order the construction, at government expense of an experimental motor on Gamgee's plan. It will be seen that the hallucination of perpetual motion has taken complete possession of the Chief Engineer's brilliant intellect, and made him for the time being the laughing stock of the engineering world. This is much to be regretted, for Mr. Isherwood is an individual of superior attainments, and high capabilities. That such a man should embrace so palpable a delusion, and run off into such a labyrinth of absurdities as the report shows, is very strange.

The very best thing that the Secretary of the Navy can do is to clear out from the Washington navy yard at once, the whole crowd of Gamgee followers, and allow no more of the public money to be wasted on such stupid and irrational schemes.

It is unfair to Keely to allow this thing to go on. His perpetual motion is kept going by supplies drawn from willing victims—the private contributions of New York speculators. But it appears that Gamgee, Isherwood & Co., have an eye to the resources of the national treasury, to drive their wheels. In both cases it is money that makes the motor go.

The Partial Eclipse of the Sun.

The sun will be partially eclipsed May 27. The greatest obscuration occurs in latitude 69° 4′ north and longitude 90° 24′ east of Washington, or in northern Siberia, where 0·737 of the sun's diameter will be obscured 8·84 digits.

The shadow (Penumbra) first touches the earth in latitude 39° 9′ north and longitude 178° 40′ west from Washington, in central China, and leaves the earth in latitude 46° 20′ north and 17° 18′ west from Washington, or in central Minnesota—Morrison county. In the United States the southern limit of the eclipse begins on the Pacific coast, a few miles south of Astoria in Oregon, passing through Portland, Salt Lake City, and just south of Pueblo, Col., taking in Leadville, Denver, Colorado Springs, etc, where the eclipse will be very slight, and occur very late in the afternoon; at Denver at 6:13 P.M.; at Jefferson City, Mo., the middle of the eclipse occurs at sunset, the sun setting partially eclipsed. The sun will set more or less eclipsed throughout Missouri, Illinois, Iowa, Wisconsin, Michigan, Indiana, and Ohio. From Cairo, Ill., the boundary line of the eclipse, where it begins at sunset, follows the general direction of the Ohio river to Zanesville, thence to Buffalo, N. Y. Thus none of the Southern Atlantic or New England States are favored, and the North Central States will only see the sun set with a very small eclipse upon it.

The Gamgee Zeromotor.

Some of our American contemporaries are speaking with considerable hopefulness of a new motor which has been designed by Professor Gamgee, and which has recently been reported upon favorably by Chief Engineer B. F. Isherwood. This "zeromotor," as it is called, is, it appears from Mr. Isherwood's report, an apparatus by means of which the heat in water or other objects at a natural temperature may be utilized to vaporize ammonia under very considerable pressure, the gas so obtained being used to move a piston in a cylinder, and being employed with the greatest practicable measure of expansion. The ammonia gas becomes "by that very expansive use greatly refrigerated and diminished in bulk, and partially liquefied at the end of the stroke of the piston, when it is exhausted and then returned by a method invented by Professor Gamgee to the ammonia boiler whence it came. The cycle is thus a closed one; no material is lost, and no heat is rejected in matter leaving the engine." It is not quite clear how the gas can be "diminished in bulk" by "very expansive use," but we may pass this point by for the present. Mr. Isherwood goes on to speak of the engine utilizing the heat in natural objects, and therefore costing nothing in money for fuel, while he enlarges on the great value for naval purposes of such a motor, particularly to the United States, which does not possess coaling stations in different parts of the world, and finally he recommends his department to spend money in assisting Professor Gamgee to prosecute his experiments.

We must own to considerable surprise at finding an engineer of Mr. Isherwood's experience give his support to such a scheme. We need scarcely say that it is utterly chimerical to attempt to obtain continuous motive power in the manner in which Professor Gamgee proposes, as it would be to attempt to continuously propel a vessel by utilizing the power derived from a turbine driven by water entering through a hole in the vessel below the external water line. For instance, if we suppose such an engine as Professor Gamgee proposes to be constructed, and to be in the first place cooled to a temperature below that of surrounding objects, so that there may be a flow of heat into it, then unless the whole of the heat so flowing into the machine be converted into *external* mechanical work, the temperature of the apparatus will rise more or less gradually until it attains the temperature of objects around it, when the inflow of heat from these objects will cease, and as a matter of course the development of work also. We have said *external* work because any work expended in overcoming the internal frictional resistances of the machine will, as a matter of course, only aid the rise in temperature. As a matter of fact, Professor Gamgee's proposed zeromotor is simply a perpetual motion in disguise, and the sooner this fact is recognized the better for those who are concerning themselves with it.—*Engineering.*

The *Art Interchange* instructs its readers how to color a pine floor which is to be partially covered with rugs, a fashion which prevails to a great extent just now. Obtain at any house-painter's store turpentine and linseed oil (not boiled). Ask the clerk to put a little Japanese drier in the turpentine. Buy either burnt sienna or Vandyke brown, or both, according to the color of the rugs and the tint on the walls. These colors come put up in tin cans, smaller but otherwise similar to tomato or fruit cans. After the floor has been washed thoroughly clean, and dry, begin by mixing in another receptacle the oil, turpentine, and paint. The mixture should be so thin that it will run with liquid readiness. Lay it on with a brush, stroking the brush the way of the grain of the wood. Protect your hands with old gloves, and go over the floor with a rag. In fact, you will need two rags, one pretty well charged with paint, to rub in every crevice, and another rag to rub off any superfluous paint. Do not stop in a straight line across the grain of the wood, but carry the brush irregularly down, taking a hint from nature's lines in the wood. By mixing the burnt sienna and Vandyke brown a rich color will be produced without using the paint thick. The mixture should be so thin that the grain of the wood will show through. If too much turpentine is used the paint will rub off. If too little, your room will need more days to dry. Use twice as much oil as turpentine. Do not economize the oil, and be as prodigal in rubbing as your strength will permit.

AT a Berlin feather-dyeing establishment an ostrich feather dyed in shades with methyl-violet was laid upon a paper upon which some ammonia had been poured but had dried up again. After a time the feather became partially green, the green passing gradually into violet, and producing an extraordinary effect. This reaction is being utilized in feather-dyeing, and will probably be applied in the manufacture of artificial flowers.