Iron manufacturers, we believe, would gladly adopt any practical method of smelting ore by which a saving of fuel could be effected; but every smelting furnace has now its blow-pipe in its hot or cold blast—which ever is used—and this cannot be much improved without substituting a blast of oxygen gas for that of common air. As common air contains four parts of nitrogen to one of oxygen, and as the former is perfectly inert and of no use to promote combustion, all the fuel taken up to heat four-fifths of the blast is therefore wasted. By using oxygen gas for the blast, a more intense heat would be secured in the furnace with far less fuel. Great attention has been directed to the manufacture of oxygen gas at a low cost, for the purpose of using it in smelting metals upon a large scale; but thus far without success. There is also another difficulty in the way of using oxygen for smelting in common furnaces. These are lined with fire brick which is capable of withstanding the temperature produced by the common blast; but with the use of oxygen the heat generated would be so intense that they would be liable to fuse as well as the ore. With a dry atmosphere and the use of graphine as fuel in a cupola urnace, we have known of the fire brick fusing like lass during the melting of pig iron. Probably some more fractious material, however, could be obtained to obviate this difficulty.

The heat of the waste gases of iron-smelting furnaces is employed in many large establishments for generating steam in the boilers of the engines that are used to drive the necessary machinery. For this purpose the gases are conveyed in pipes under and around the boilers, and thus the waste heat is economised. In iron-smelting furnaces the heated gases must pass off at a very high temperature; this is inevitable in maintaining the high heat required to reduce the ore, and it is only by such modes as those described for applying such waste heat that it can be economised, to the saving of fuel. It should not be forgotten also that lean ores require more fuel in smelting than rich ores, because a greater quantity of ore has to be acted upon to obtain the same amount of pig metal. We have no doubt that iron manufacturers would readily adopt any new practical method for smelting that would save one tun or half a tun of coal to the tun of iron, for the cost of coal is the greatest expense incurred in many places in reducing iron ores. In the iron region of Lake Superior, for example, where the ores are so abundant and rich, there is no coal, and that which is used has all to be carried from a great distance. If one tun of coal could be rendered sufficient to reduce one tun of Lake Superior iron from the ore, pig metal could be produced with profit for $16 or $17 per tun. This is an important subject, especially at the present time when coal is so high in price and iron is in such great demand.

LUBRICATING CRANK PINS.

In a foreign exchange we find an account of a method used to lubricate the crank pin of a small engine, such as is used for driving the blowers on board of our steamboats, said engine running at the rate of 300 revolutions per minute. The crank pin was bored out internally, nearly through from end to end, and two holes were drilled from the surface of the pin into this hollow center. A tallow candle was put into the central orifice and the same closed by a screw plug. When the pin became heated by friction the tallow fused and ran out through the small holes. In this way the pin was always well lubricated; one candle lasted a whole working day.

The plan adopted on our gunboats, where the engines run at speeds of from 85 to 100 revolutions per minute, is to have a stationary oil cup fitted to a stationary bracket, said bracket being directly over the cranks when they are vertical; this oil cup is furnished with a ball-and-socket joint at the bottom, from whence a pipe proceeds which is a little longer than the stroke of the cranks; into this pipe a second one is slipped (like a telesoope) which communicates with a ball-and-socket joint on the strap of the connecting rod on the crank pin end. From this arrangement it is easy to see that when the upper stationary cup is filled with oil, the fluid will run down the pipes on to the pin, without incurring loss or imperfect lubrication. The ball-and-socket joint allows the pipes to work back and forth quite easily. Nearly all the navy vessels are thus fitted.

WATER WHEELS IN THE KITCHEN.

Quite a novel, and it would appear a profitable application of water power has been recently made in England, and our inventors, proverbially enterprising and wide-awake, have in this case been a little distanced by their transatlantic brethren. Schiele, a skillful and well-known manufacturer, celebrated also as the discoverer of the anti-friction curve, so extensively used in machinery both here and abroad, has designed a small turbine wheel which has been applied to domestic use in many cases with great success. Attention has been given to the subject in this country also, but on a limited scale. There is no good reason, however, why it should not be more fully developed. In small families, it is true, there is not much work for a water-wheel, soberly speaking; but in large ones there is a great deal of mere "pulling and hauling" which might be done by machinery instead of hand labor, such as driving the wringing-machines, mangles, chopping meats, sifting ashes, drawing wood, &c., and although we must not suppose that every house will be fitted up like a factory, it is not unreasonable to expect that in future large establishments and those of moderate size will have a due proportion of labor-saving machinery. For hotels and stores small water motors would be a great improvement on steam, which is too often under the charge of incompetent and reckless persons; and for printing offices in towns where water can be laid on with a sufficient head, the class of motor advocated would be both useful and economical. The New Haven *Register*, we are told, is now printed by the agency of such a machine. In fact, the uses to which a small and convenient water wheel or hydraulic motor of any shape can be put, are infinite, and readily suggest themselves to all The motive power should be so made that it could be taken off and put on the water pipes as easily as a gas meter is attached to its place, and the shaft should have a universal joint upon it, so that it could be diverged from a straight line if necessary and adapted to suit circumstances.

During the past eighteen years there have been quantities of water wheels illustrated in the Scientific American, and we do not see why the enterprising inventors of them should not take hold of the subject here suggested and work it out to a practical issue.

WHY ARE THE MONITORS IDLE?

In common with a great portion of the community we should like to know why the monitors are idle; for that they are, virtually, everyone must admit. Bombarding the ruins of an old fort without any guns in it is not exactly what they were designed for, and does not seem to require a great deal of strategy or the most superhuman naval talent. We have the fullest confidence in the vessels themselves, and believe them to be capable of going anywhere within the range of the rebel guns; we should like to know why their offensive powers are not brought into use. General Gillmore has done all and more than was required of him, and is now daily throwing Parrott shells into Charleston; what are the monitors doing? Giving a moral support to General Gillmore, we suppose, for they are certainly idle in every sense of the word. The fearful beer-barrel and clothes-line harbor obstructions which were to sink every vessel that came near them have been brought to light; they have been torn up by the violence of the sea; the way is therefore clear to advance, and we should like to be told why no effort is made to get a few inches at least nearer to Charleston.

THE MACHINISTS STRIKE.

The difficulties between the strikers and their employers still remain unadjusted. The men refrain from work and the manufacturers are equally firm in maintaining their position. It is therefore only a question of time when the machinists trade will be resumed in this city. Large numbers of men have left to obtain work in other towns. The strike is not general throughout the trade, as a great many of the workmen would gladly go to work if they were not deterred by threats and the fear of violence from their fellows. We are told that parties of machinists go to shops where certain men are employed under contract, and who have had the courage and honesty to continue on in their duty despite threats, and endeavor to deter them from pursuing their occupation; also that apprentice boys have been warned to discontinue their work, or they would be made an example of. This is entirely wrong and should not be permitted by the better class of machinists. Such a course will soon deprive them of their real friends. If any man wishes to go to work, *he must be allowed to go;* he should not be bullied or abused in any way. This is still a free country, and if reason or argument cannot convince a workman that he is doing wrong to work when his comrades are idle, then there is no help for the others but to submit. Mob law and terrorism won't do, and we hope our friends will heed our words and not disgrace a trade which has always borne a good name, by any overt acts. It would be far better for all hands to go to work than to lose more time in trying to obtain what, it is very evident from the attitude of the proprietors, will never be granted.

NITROUS OXIDE AS AN ANESTHETIC.

A few weeks since we published a letter from Prof. Dussauce, against the use of nitrous oxide or laughing gas as an anesthetic agent, in which he quoted the opinions of several distinguished chemists, as to its injurious effects upon the human system. Two communications have since appeared in our columns against the views expressed in that communication, and in these the safety of this anesthetic agent was advocated. A short reply by Prof. Dussauce will be found in another column. He simply states that he has no intention to engage in a discussion upon the subject, but reiterates his former opinions as coinciding with those of the authors to whom he referred. The *Cosmos* for this month contains an article upon this subject by George J. Ziegler, M.D., in which he describes the characteristics of nitrous oxide, and wherein it differs from ether and chloroform in its effects upon the human system. He states that other anesthetics are directly sedative in their action upon the animal organism; whereas it is primarily and permanently stimulative, not being followed with any of that languor so peculiar to the others. There is a relation between its action and that of atmospheric air, as it contains a greater proportion of oxygen. At the same time, he states that as an anesthetic it is not altogether devoid of danger. It produces a sort of delirium of a pleasurable and sensitive character; but he says, "It cannot nevertheless be indiscriminately employed with safety; for the artificial excitement of the system which is rapidly engendered by its free administration, may not only prove injurious by directly increasing the tendency to irritation, hemorrhage and inflammation, in the parts subjected to surgical mutilation, but may also develope latent pathological tendencies of a different as well as of a like character in other parts of the body, in persons with certain abnormal predispositions; to such a degree, indeed, as to seriously injure health, if not absolutely endanger life itself."

He states that the character and particular manifestation of such tendencies depends upon the special predisposition of the individual system acted upon, as the nitrous oxide has "a marked preference for the blood, brain, nervous system and genito-urinary organs." Undue excitement occasioned by the free or inappropriate use of the protoxide of nitrogen may produce primary and secondary irritation, congestion, serous or hemorrhagic effusion and inflammation in different parts of the body, and especially in the brain and kidneys. In other cases, however, it may produce beneficial effects by aerating the blood and stimulating the action of the system. It has undoubtedly sanative properties, but Dr. Ziegler states that while he does not undervalue this remarkable agent and has no disposition to excite undue apprehension respecting its potent action upon the human system, his precautionary remarks respecting its nature and indiscriminate use are put forth for the purpose of enabling it to be so applied as to avoid evil and obtain good. Hence he says, "Nitrous oxide should always be administered with great care and precaution."