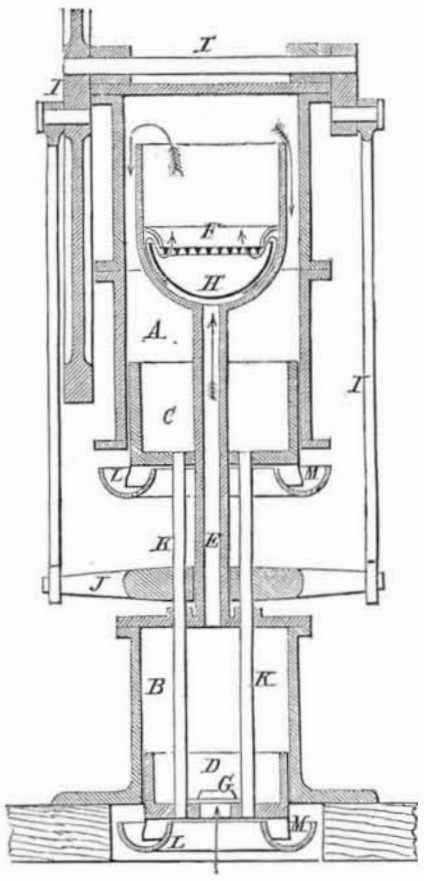
Correspondence.

The Hot Air Engine.

To the Editor of the Scientific American:

I have another modification of the hot air engine to suggest. We have had several of these engines of the Ericsson and Roper stamp, mostly of the latter, in use in this vicinity for a sufficient length of time to test their merits pretty thoroughly; and I am convinced that, when properly managed and not pressed beyond their normal capacity, they are both efficient and economical as a moderate power, say from one to four horse; but I believe that their efficiency may be largely increased by a slight change in the arrangement of their parts. The chief trouble is caused by the action of excessive heat upon their active parts; this is especially the trouble when working up to their full capacity.

In a previous letter (on page 373 of your volume XXVIII), I suggested that the trouble from over heat might be avoided, partially at least, by placing the cylinder directly below instead of one side of or above the fire; this modification and some additional ones are clearly delineated in the annexed illustration. A represents the hot air cylinder; C, its piston; B, the cold air or supply cylinder; D, its piston; F, the fire box and grate; H, the ash pan. The pistons are perma nently connected together by the rods, K, and to these rods the cross arm, J, is permanently fixed. This arm transmits motion from the pistons to the parts marked I, namely, the connecting rods, crank, fly wheel, and shaft, as shown.



At each downward stroke of the pistons, the valve, G opens and admits cold air into the supply cylinder, B; and a each upward stroke, the cold air is forced through the pas sage, E, into the ash pan, H, and through the grate and fire F, thence over the edge of the fire box, down the annular space between the fire box and the wall of the hot air chamber to the cylinder, A, forcing the piston, C, downward by its expansive power; thus the operation continues while the fire lasts.

The direction of the air is clearly indicated by the arrows. It will be seen that this arrangement admits of the cylinders being open at the bottom, so that a self-lubricating device may be attached; it consists of an elastic ring, M, attached to the piston, and a circular reservoir of oil or water into which the ring dips at each downward stroke of the piston. This self-oiling of the piston, without waste of oil, is certainly a valuable feature of this arrangement, and the constant flow of cold air through the center of the hot air piston and cylinder, up the passage, E, will tend to keep down the temperature in the cylinder below a troublesome point.

The minor details, such as the exhaust valve, fuel door, regulator, etc., I have not given in the illustration, but I would recommend placing the exhaust valve at the highest point in the hot air chamber; the powerful upward tendency of heated air suggests this idea. I would also suggest making the exhaust valve and passage at least twice as large as they usually are; this idea is suggested by the low tension of hot air as compared with that of steam, and its consequent more sluggish motion.

The desire of the operators of these engines, to get more work out of them than they were designed to supply, seems to be the cause of the chief injury or trouble; and I have no doubt that there will be such a modification in the proportion and disposition of their parts as to greatly mitigate this danger from overheat, and also to largely increase their efficiency.

F. G. WOODWARD.

REMARKS BY THE EDITOR:—Our correspondent's plans for the improvement of the hot air engine seem to be in the right direction, and we shall be glad to hear from him again. The minor details he alludes to are of great importance. We shall be pleased to see his plan for feeding the furnace without stopping the engine, if he has worked up that detail.

The Rights of Inventors.

To the Editor of the Scientific American:

Pardon me if I take exception to your views as expressed regarding patents, in your last issue, when replying to the queries of the Hon. Hamilton Fish; but the ground taken seems so unjust to the large body of discoverers and inventors that I cannot refrain from at least expressing my opinion.

I think that the productions of a man's brains are just as much his property as that acquired by the labor of his hands. A patent is a title to that property, given him by the government as *prima facie* evidence that he is the owner, and the same laws which govern the rights of property should apply to a patent. If, as you say, "the invention by an individual of a new device by which his fellow men are benefitted does not entitle him, by any process of natural right or natural justice, to be a monopolist over his fellows, in respect to such article," and, "on the contrary, every man in every community is bound by the strongest natural obligations freely to contribute his best powers of mind and body to promote the common welfare," it is just as reasonable to say that every dollar that he earns shall be used for the benefit of his fellow men.

Acquisitions of any kind are at the expense of labor, force, vitality, or, what is regarded as their equivalent—money, and if I have passed the best days of my life in patient study, self denials, disappointments, misgivings and failures to wrest from the secret forces of Nature that which any one else might have gained by the same means—by what right, natural, legal, moral or social, does that process, when I have acquired it, belong to any but myself, any more than the bread that I have earned by the sweat of my brow? I simply ask the question. I cannot answer it.

J. E. WILSON.

REMARKS BY THE EDITOR.—Our correspondent forgets that his person and all his possessions belong to the State. If by years of toil and study he has acquired property, the State may seize it: may take his body and compel him to service: may imprison him, or even destroy his life. Our correspondent lives in the constant experience of these facts. When the State wants money, it helps itself from our correspondent's earnings; when it wants a new road, it takes his lands, pulls down his house, and drives him away, *nolens volens*. In a community, all private interests and rights are ignored. Were it otherwise organized, society could not exist.

Let us follow out our correspondent's theory and suppose that he were the first inventor of bread. The exclusive right to make, use and sell bread would be his by natural right, transmissible to his heirs and assigns for ever, if we understand our correspondent; and all the world must starve if he or they should so will. Such reasoning is manifestly untenable.

While an individual may labor and enjoy the fruits of his labor, he cannot be permitted to interfere with others who do the same thing, unless by their consent.

Now, a patent is an interference with the rights of others; but the people consent to it temporarily, on the ground of expediency. The State wishes to encourage individuals to invent. The promise of a patent tempts men to do so. The new arts and inventions thus discovered are in due time seized by the State and become public property. A patent is simply a reward offered for a special purpose. It is a mere baited hook for the catching of inventions for the sole benefit and use of the people.

Water as Fuel.

To the Editor of the Scientific American:

I observe, in your issue of April 5, some observations on this subject, to which, as the data are not fully described in the *Alta*, your editorial remarks hardly apply. In addition to the *Alta's* description, I may mention that the boiler is a small one (working under only 40 lbs. pressure), from which the steam passes through a superheater, which is a pipe bent several times at right angles to itself, and at each angle there is a flat disk against which the steam impinges. This is said to have the effect of decomposing or breaking up the steam, pretty much on the same principle as some atomizers for inhalation were arranged. The steam, then, is directed against a jet of any hydrocarbon, which is claimed to unite with the oxygen of the water, leaving the hydrogen to be consumed by contact with the oxygen of the atmosphere, thus forming a veritable oxyhydrogen blast. Of course, a fire has to be lit under the boiler to start the steam, and thus the inertia is overcome; but, the boiler and superheater being situated within the influence of the oxyhydrogen flame, when steam sufficient is generated to start the oxyhydrogen blast, no more fuel is required to keep up the steam in the boiler.

I am no believer in the slightest approach to perpetual motion, and I must say this looks very like it, with the exception of first overcoming the inertia by other means than those self-contained. I have visited this furnace several times to judge for myself; and, for the size of it, I must say it is the most powerful flame I have ever seen, and its effects are most satisfactory in smelting refractory ores. It is called here, I think, the Stevens patent.

If, as is claimed, steam can be decomposed and broken up, or, rather, broken up and decomposed, by striking, under pressure and heat, against angular projections, leaving the oxygen to combine with a hydrocarbon, and leaving the remaining hydrogen to unite with the oxygen of the air, then the invention is based upon scientific laws and actually works in practice. But if that claim is fallacious, then there must be some hitch which I have failed to detect, as the boot top experiment cannot be gainsaid; but if the thing is not based upon scientific principles, I should like to know where the hitch comes in.

I am inclined to think that the steam is volatilized, if I may use the expression, by repeated breaking up or division of its molecules, as water or perfume is broken into spray; and in that state, the union of the oxygen with the hydrocarbon is facilitated.

I have no interest in the matter other than as an inquirer and student of natural philosophy.

Oakland, Cal. A. W. T.

REMARKS BY THE EDITOR.—We will allow that the steam, by striking against the disks and passing through the superheater, becomes so intensely heated that it is decomposed; but, even in this case, there is no "hitch," and our remarks in our journal of April 5 apply with full force to this and all other cases in which water is used as fuel. The "hitch," in our correspondent's conception of the process, appears to be that he considers the steam to have acquired so much power, after being decomposed, that it is able to form the same quantity of steam, and have a large reserve of heat remaining. This would be true perpetual motion, except that the process has to be started by the use of coal. Now it must be evident that, if the steam cannot commence its decomposition without fuel, neither can it continue this disintegration without a similar amount. A very simple experiment would prove the truth of this proposition. If the decomposed steam has enough heat energy to enable it to decompose a similar amount of steam, and leave something over, we have only to cut off the supply of hydrocarbon, and the process will go on, with somewhat diminished intensity, to be sure, but still quite vigorously. If this experiment were to be tried, there would be a "hitch" indeed.

The Proposed Transatlantic Balloon Voyage.

To the Editor of the Scientific American:

In regard to the feasibility of a transatlantic trip by means of a balloon, my impression is that Professor Wise understands himself and his subject infinitely better than do the public; and it is extremely probable that his success is more than possible. The fact is well known that currents of air, moving in different directions, form the aerial strata around the earth; and all that would be needed by the navigator, in order to make balloon voyaging a perfect science, would be to understand these movements. These can be determined by observation and experiment; and it may be, in future years, that we shall be as familiar with these air strata as the geologist is now with those of the rocks, or the navigator with the currents of the ocean. Fixed laws govern all matter, and we are all children in the great school of Nature, learning these laws. Where is the great danger and difficulty about balloon navigation when these currents are known? It will be a mode of navigation safer and far speedier than the ship or steamer. The ship is confined to one stratum of the atmosphere, where may prevail a terrific tornado in which nothing will live, while the balloon may rise or fall out of danger when navigators of experience control her. A well constructed balloon will be as safe as either the ship or steamer. There is no more danger of the collapse of a balloon than of a ship springing a leak or a steam boiler exploding; besides, the balloon may be divided into compartments of air chambers to insure greater safety. I remember reading a year or two since an article, written, I think, by Chancellor Livingston in 1812, in reference to the feasibility of steam carriage by rail, in which the Chancellor ridicules the idea as preposterous, and states why the project will not succeed. His reasons why are very laughable to us now, who see their fallacy. All inventions of value to the world spring not forth as Minervas, but have their babyhood, youth, and manhood. I truly hope Professor Wise may be encouraged in his grand enterprise.

New York city. C. ROWLAND.

The Meteors of November 14 and 27.

To the Editor of the Scientific American:

The meteoric display whose present epoch is November 14 occurs later in the month at each successive return. In other words, its node progresses on the ecliptic, so that an interval of 33 years corresponds to an advance of one day in the date of the shower. In 1932, therefore, the periodic fall of stars will occur on the 16th of the month. On the other hand, the node of the Biela meteors has a retrograde motion. The latest showers from this source were those of November 29, 1850, and November 24 to 27, 1872. At the same rate of motion, the nodes of the two rings will meet about November 16 or 17, 1932. As these meteor clouds move in opposite directions, the double shower at that time will probably be one of unusual interest.

Bloomington, Ind. DANIEL KIRKWOOD.

Fruit Safes.

Fruit may be preserved in excellent condition the year round, provided the temperature be low and dry. It is becoming now to provide fruit safes for this purpose, and in some localities the neighbors unite to construct a suitable building, in which each subscriber is entitled a fixed share of the storage room.

Mr. Christopher Shearer, a fruit farmer near Reading, Pa., has a fruit safe fifty-five feet square, which holds, when filled, about one hundred and forty cartloads of ice and four thousand bushels of fruit. Last fall Mr. Shearer placed in it one thousand seven hundred bushels of apples, four hundred and fifty bushels of Bartlett and fifty bushels of Lawrence pears. Some of the apples are still there and as solid as when they were taken from the trees.