

of copying linear drawings by the photograph is only about *one-tenth* as much as the hand system. Such are the results obtained at the Ordnance Office in England, in which a saving to the government of \$200,000 per annum has been effected by the adoption of the photograph for this particular purpose.

Professor Jillson has arranged a single index to the Patent Office report, by which the name of each patentee, the number of his patent, the pages of the drawing and claim, are all exhibited at a glance. This is an excellent improvement. Heretofore, it has been necessary to consult two separate and inconvenient indexes.

B.

#### FLYING MACHINES IN THE FUTURE.

Of all inventions of which it is possible to conceive in the future, there is none which so captivates the imagination as that of a flying machine. The power of rising up into the air, and rushing in any direction desired at the rate of a mile or more in a minute, is a power for which mankind would be willing to pay very liberally. What a luxurious mode of locomotion! To sweep along smoothly, gracefully and swiftly over the tree tops, changing the course at pleasure, and alighting at will; how perfectly it would eclipse all other means of



travel by land and sea! This magnificent problem, so alluring to the imagination and of the highest practical convenience and value, has been left heretofore to the dreams of a few visionaries and the feeble efforts of a few clumsy inventors. We, ourselves, have thought that, in the present state of human knowledge, it contained no promise of success. But, considering the greatness of the prize and the trifling character of the endeavors which have been put forth to obtain it, would it not indeed be well, as our correspondents suggest, to make a new and combined effort to realize it, under all the light and power of modern science and mechanism?

What little attention this subject has heretofore received from inventors has been almost wholly confined to two directions—flying by muscular power and the guidance of balloons. Both of these we have been accustomed to regard as impracticable. But, as Mr. Hyatt suggests, the flying by muscular power is a field of invention which has by no means been thoroughly explored. Though it may be impossible for a man to raise his own weight rapidly by beating the air, the *sustaining* of his weight in the air and moving horizontally is an entirely different problem. In the bird, the wings are moved by the most powerful muscles in the system. Has this hint been acted upon, and the muscles of the legs and shoulders been brought to bear upon the wings in the most efficient manner? Again: has the constancy of the rotary motion been made available in a flying machine? If spiral fans were used, of course, two sets would be required to prevent the machine from turning itself in the direction opposite to the motion of the fans.

But the thing that is really wanted is a machine driven by some natural power, so that the flyer may ride at his ease. For this purpose, we must have a new gas, electric or chemical engine. What we require are two or more substances, solid or liquid, which, by merely being brought in contact, would be converted into gas. Place these in the re-action or Avery engine, which, by running at high velocity, would yield a large power in proportion to its weight, and it is possible—yes, proba-

ble—that the machine would drive spiral fans with sufficient force to raise itself from the ground. Would not the binoyd of hydrogeu and charcoal fill these conditions? This engine would run with such immense velocity that the fans would have to be very small; and it is probable that a moderate widening of the arms themselves—giving them a spiral inclination—would be the true plan. There might be two generating vessels,



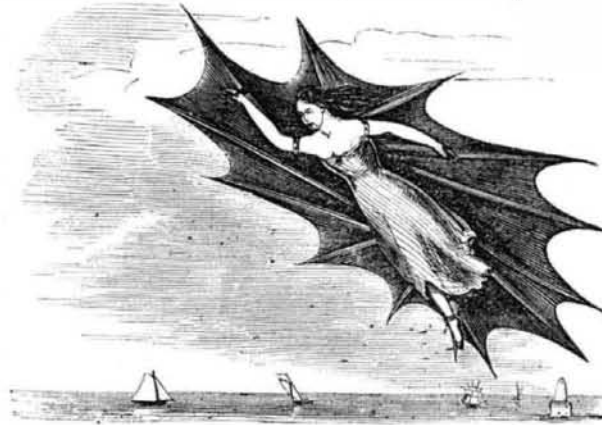
corresponding to the steam boiler; and when one was exhausted, the second might be brought into action while the supply of material was renewed in the first; thus supplying and exhausting them alternately.

The simplest, however, of all conceivable flying machines would be a cylinder blowing out gas in the rear, and driving itself along on the principle of the rocket. Carbonic acid may be liquified, and, at a temperature of 150°, it exerts a pressure of 1,496 lbs. to the square inch. If, consequently, a cylinder were filled with this liquid, and an opening, an inch square, made in the lower end, the cylinder would be driven upward with a force equal to 1,496 lbs., which would carry a man, with a surplus of some 350 lbs. for the weight of the machine.

We might add several other hints to inventors who desire to enter on this enticing field; but we will conclude with only one more. The newly-discovered metal aluminum, from its extraordinary combination of lightness and strength, is the proper material for flying machines.

#### FLYING MACHINES—A BIRD-WOMAN.

Messrs. Editors:—I have seen in your paper an offer of \$1,000, from Mr. Hyatt, for the best flying machine; and also (on page 116 of the present volume) a



letter asking for communications on this subject, and I thought I would write to you what I know about it. Six years ago, a friend (a Spaniard) told me that he had once witnessed or read an account of (I don't remember which) the trial of an apparatus for flying through the air. This apparatus was made by an old philosopher, and the experiment was made by his daughter above the bay of Barcelona (Spain); there being numerous boats on the waters of the bay, in case of accident. The experiment was perfectly successful; the young lady circled round and round for many miles, imitating most of the motions of the birds, and landed safely upon the shore. Unfortunately, however, the scientific world was never made aware of this successful experiment in aerial navigation, for the apparatus of the "bird-woman" was ruthlessly seized by the police as soon as she touched *terra-firma*; the authorities considering that her "machine" would be dangerous if made public, and used for unlawful purposes. This happened about 10 years ago. All that "leaked out" in reference to the shape of the apparatus was that it looked something like a

bat on the wing, and was made of varnished silk, with some mechanism (to give and direct its motion) operated by the feet and hands of the fair aeronaut.

If Mr. Hyatt or other persons are anxious to learn anything further about this machine, perhaps they can obtain information from the above source. E. M.

Boston, Mass., August 25, 1860.

[We suppose that the "source" of information to which our correspondent refers is the Barcelona police who seized the flying maid. We imagine that Hyatt would have a "good time" in trying to find out about a matter which seems to have frightened the authorities of Barcelona out of their common sense. However, we give the statement for what it is worth; and if this letter of our correspondent should meet the eye of any member of the police of the above-named city, who was cognizant of the facts above narrated, he will oblige us by communicating the same.—Eds.]

#### HYATT'S \$1,000 PRIZE.

Messrs. Editors:—I see by your paper that Thaddeus Hyatt offers a prize of \$1,000 for the best flying machine. Now, I would like to know whether there are any conditions affixed to this offer. Is there any particular distance required for the machine to fly? Will a navigable balloon fill the requirement? Must the machine be able to raise a man? Some of us would like to see Mr. Hyatt's offer made more definite on these points.

Of course a practical flying machine, cheap in its construction, and operating at little expense, and which would transport a man unlimited distances through the air with certainty and safety, would be the source of immense wealth to its inventor, and the offer of a thousand dollars for such a machine would be ridiculous. But if Mr. Hyatt is a public-spirited man of wealth, who is ready to pay \$1,000 for a *step* towards the acquisition of this greatest boon which science and mechanism can bestow on the human race, it is possible that he may have the opportunity of doing so. I am, gentlemen, one of those inventors who profess to understand that matter is not to be moved without the expenditure of adequate force; and it is my opinion that an offer of \$5,000 or \$10,000 for a machine that would raise the body of a man from the ground, without any buoyancy of the atmosphere, but simply by beating the air, would call forth more than one competitor, and that the prize would be carried off. It is possible, even, that this thousand-dollar prize may call forth inventions that will fill the conditions if they are sufficiently easy; for instance, if *models* only are required, which will fly with their own weight by their own power in beating the air. B. G.

New York, Aug. 25, 1860.

MAKING CLOTH FIREPROOF.—A patent has lately been secured by F. A. Abel, of the Royal Arsenal at Woolwich (England), for a new method of rendering textile fabrics proof against fire. He takes 25 lbs. of sugar-of-lead, and 15 lbs. of litharge, and boils them for half-an-hour in 40 gallons of water, when the liquor is allowed to settle. Any quantity of the clear liquid that will suffice to cover the cloth to be operated upon is now taken, and the cloth is immersed and freely saturated in it, then dried in the open air. The cloth is now immersed for about one hour in a hot, and moderately strong solution of the silicate of soda, then thoroughly washed in cold water and dried. By these operations an insoluble silicate is formed within the pores of the cloth, thus making it fireproof.

IS THE SUN GROWING COLD AND DARK?—There are now more spots on the sun than have been seen before for many years; some of these are visible through a smoked glass to the naked eye. Several stars—some of them of great brilliancy, which, from their ascertained distance, must have been as large as our sun—have totally disappeared from the sky; and the question has been raised among astronomers, whether the light and heat of the sun are gradually fading away. As this would be accompanied by the destruction of all the plants and animals on the earth, it is rather an interesting question. The sun's light and heat is diminished by the dark spots at the present time about 1 per cent.