AERIAL NAVIGATION.

NUMBER FOUR.

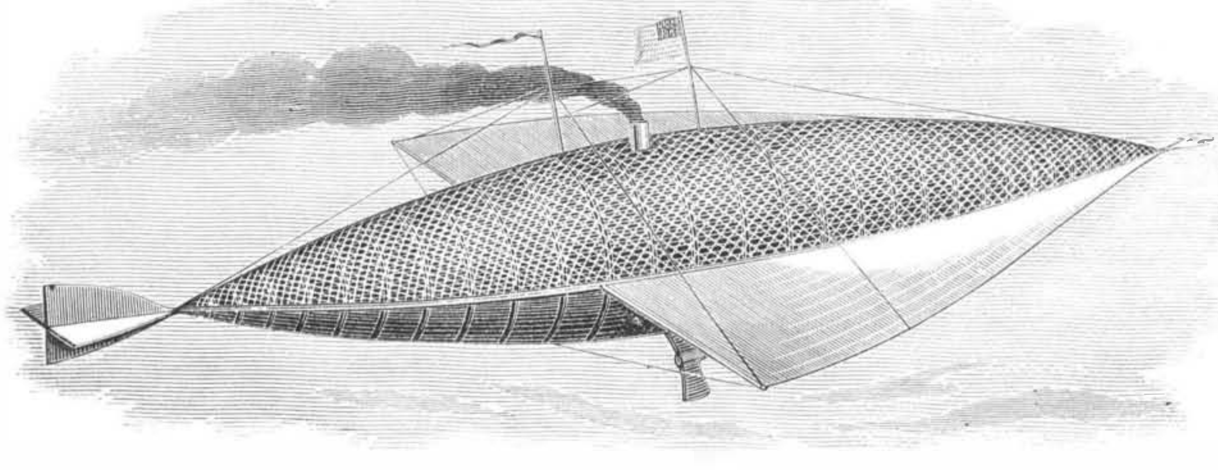
Subsequent to the experiments of Mr. Porter, Dr. S. P. Andrews, of Perth Amboy, N. J., a gentleman well known in scientific associations, and of high reputation as a successful inventor, devoted much time and money to the subject of aerial navigation, and with partial success.

Having been early acquainted with scientific principles, and had extensive experience in mechanics, his projected enterprise gained much confidence with many intelligent men, who supposed him to be more competent to accomplish this long desired scientific improvement than any other man; and this confidence in his ultimate success yet remains, in the minds of many, unimpaired. But to give our readers a chance to judge for themselves, we shall give a general description of his ingenious arrangement. The float or buoyant supporter consists of three cylindroids—cylindrical three fourths of their lengths, but tapering to points at the end. These are placed side by side, horizontally, and connected to each other three fourths of their length, which is 100 feet, and the diameter of each cylindroid is 20 feet. The contents of the united three, when inflated, is 80,070 cubic feet, and their buoyant power 5,720 lbs. This combination float is furnished with an efficient rudder for steering. About thirty feet below this combined float, an open basket saloon, sixteen feet long, is suspended by a large number of wires or cords; and within the saloon is a longitudinal rail track, upon which is a car freighted with ballast, and so connected to a crank windlass, and a pulley at each end of the saloon, that the car may be readily moved from one end to the other, though its natural position is on the center, which is a little lower than the ends of the track. When the car is brought to the rear end of the saloon, the float is thereby made to incline from ten to twenty degrees; so that when a small quantity of the ballast is discharged, the float will rise; and its upper surface, presenting about 6,000 square feet to the air above, it will naturally shoot forward, on the principle of the sails of a ship, with a side breeze. And when it has attained a sufficient altitude, the car is moved forward, which has the effect to reverse the inclination of the triple float; and by letting off a portion of the gas, the float will immediately commence descending, and, by its reversed inclination, will continue its forward motion. The ballast may be replenished as often as the saloon descends to the earth; and a supply of densely compressed hydrogen gas may be carried, whereby the float may also be replenished. Dr. Andrews has probably other improvements and facilities projected, which will be developed in the future. This machine made one ascent, some time ago, but, for reasons best known to the inventor, it did not travel far; and whether he intends to give it another trial, we are not informed. Such experiments are expensive, and the enterprising projectors are entitled to the respectful consideration of the public.

On the second of July last an exhibition of a flying machine, named by its inventor, Mr. Frederick Mariott, "The Avitor," took place in a large room of the Avitor Works, at Shell Mound Lake, Cal. We give herewith an illustration of this machine. The hopes which were first raised by the success of the experiment as performed under cover, have been since dashed by unsuccessful attempts to navigate the machine against currents of wind.

This was only a trial machine, the balloon being cigar-shaped, thirty-seven feet in length, and eleven feet from bottom to top, measured at the middle of the apparatus. Lengthwise around this balloon or float was a light frame-work made of wire, wood, and cane, and on both sides of this frame were attached wings, as shown in the engraving. A complete description of this machine was published on page 75, current volume of the SCIENTIFIC AMERICAN. The machine, as we have stated, operated quite well when shielded from the influence of winds.

But it is not enough that a machine should fly in a closed room or in still air. It must be equal to stemming very strong currents, and until this is accomplished air navigation can never be a practical success.



MARIOTT'S "AVITOR" AIR SHIP.

Manufacture of Optical Glass.

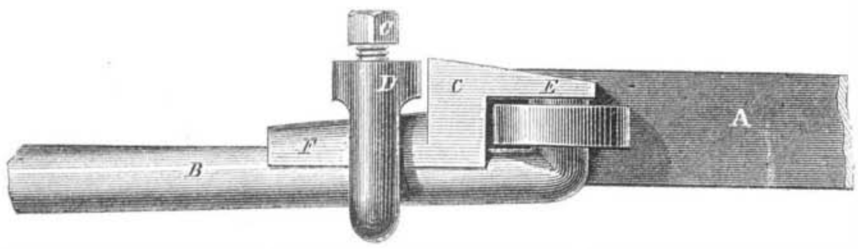
The materials are fused in the furnace; and when nearly ready for working are stirred about with cold iron rods to break the cords and lessen the cloudiness. Sometimes the metal is ladled all from the cruibles, and thrown into cold water. This stirring and ladling has the effect of breaking the strica. It is then closed up in the crucible again until it is perfectly fused in the ordinary manner, but is not worked out—as is the case at Whitefriars Glass Works—for working either with the glass-maker's rods or the iron ladle renders it worse. When a large crucible is declared to be perfectly ready, it is allowed to cool until the whole mass is one solid piece of ordinary glass, weighing about twelve or sixteen hundredweight. This mass is sure to crack up into large boulders, and from these pieces are selected those which are to be made into lenses; they are placed in large clay molds made of the best fine clay. When a piece has been selected of sufficient hight and size, it is put into a mold of the required dimensions, and then gradually re-heated until the glass has melted exactly the shape of the mold. Then, when it is sufficiently annealed, it is polished by the glass cutter in the regular manner.

Other kinds of glass are made for optical purposes by being blown with the iron tube of the glassmaker, as other things are blown, such, for instance, as glass for magnifying purposes. The glass is ladled from the crucible, then taken from the ladle on the end of the iron tube, and blown of an uniform thickness, exactly the shape of a lady's muff. When annealed it is cut up one side with a diamond, and then exposed to considerable heat. When the heat causes the glass to open where the diamond cut it, as it gradually opens it is laid on a flat surface, and spread out into a large square of thick optical glass. It is again annealed, and polished to the required magnifying power. It will be easily seen from all these processes that fine optical glass must necessarily be very expensive.—*English Mechanic.*

WOOD'S HARVESTER PITMAN CONNECTION.

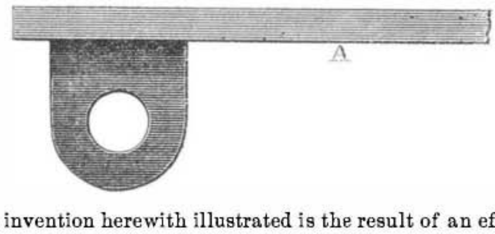
Our readers need not be told that any real improvement upon mowing or harvesting machines is important and valuable. No class of machines ever invented has perhaps produced more important results than these, and their adoption has become so universal, that it is almost as difficult to find a large farm unsupplied with one of them, as it would be to find one without a plow or a harrow.

Fig. 1



Much attention has therefore been latterly turned to the perfecting of details, which shall add to their durability, convenience, and utility.

Fig. 2



The invention herewith illustrated is the result of an effort of this kind.

It is obvious that any play on the pin which connects the pitman of a harvester to the sickle-bar must produce a blow at each reverse motion of the bar, the force of which will be in proportion to the amount of play permitted. This blow commonly called "end-shake," is productive of a disagreeable noise, and adds to the wear upon the working parts, not only of the pitman and sickle bar, but of the gearing which drives them. It is the object of this invention to obviate these evils by a simple and easily applied device, which may be employed in any of the machines now in use, and the expense of which is a mere trifle in comparison to its usefulness.

Fig. 3

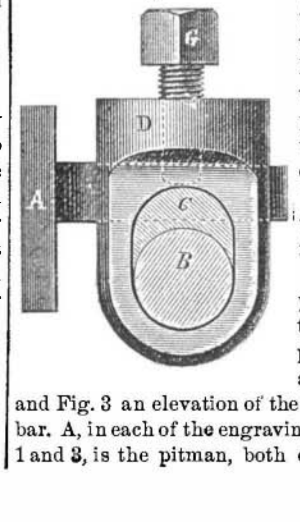


Fig. 1 shows a portion of a pitman and sickle bar connected together, and having this improvement attached. Fig. 2 is a sectional elevation of the same, and Fig. 3 an elevation of the eye and a portion of the sickle-bar. A, in each of the engravings is the sickle-bar, and B, Figs 1 and 3, is the pitman, both of which are constructed in the usual manner. C and D, Figs. 1 and 3, are the parts of this improvement. C, Fig. 1, has two arms, E and F, placed longitudinally to the sickle-bar and pitman. F is concave on the inner side to fit the pitman, and its outer surface is convex to fit the collar, G, Fig. 3. E has its inner surface flat to fit against the connecting pin.

The collar, D, Figs. 1 and 3, is placed over the pitman, B, and held firmly by the set-screw G. The flat face of the body of the piece C, may, by this means be brought up flush to the eye of the sickle-bar, and the wear of both pin and eye, be taken up as often as needful. The body of the piece, C, also receives a portion of the wear, and thus relieves the pin and adds to its durability.

The attachment and adjustment of this improvement can be made with the utmost facility, and by the use of the wrench only.

Patented through the Scientific American Patent Agency, October 5, 1869, by Rufus C. Wood, of Le Roy, Kansas, who may be addressed for rights or other information.

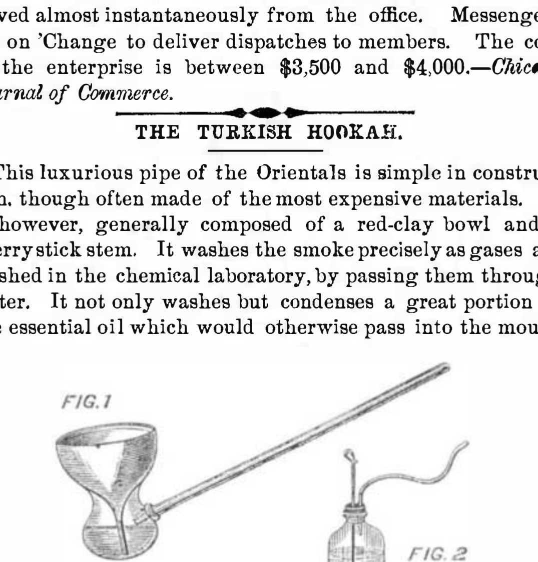
Pneumatic Tubes.

The pneumatic tube which has been erected by the Union Telegraph Co., connecting the offices of that company with the Chamber of Commerce in this city, is found to be extremely useful. The following is a brief description of it: The tube extends from the Merchants' Insurance Company's building diagonally across La Salle and Washington streets, to the Board of Trade hall, sufficient apertures having been cut through the thick stone walls of both buildings to admit the pipe or tube. This is of heavy brass, three inches in diameter inside, and one hundred and thirty-five feet in length. It is in sections which are fastened together at the joints and padded with rubber so as to render the tube air-tight. The process of transmitting the messages is simple. They are placed in a leather cup, of the shape of a dice-box, and made to fit the tube. By means of an ordinary bellows placed in the operating room, the cup can be forced over into the Board of Trade hall with great rapidity by the pressure of air. The suction of the bellows brings the cup back. The tube is supported by a tightly stretched cable of galvanized wire which extends between the roofs of the two buildings, and from which iron guys are attached to the tube to keep it in its place.

The construction and placing of the tube was a difficult matter. A small inclosure is constructed in the Board of Trade hall, where messages are sent, received, recorded, and dispatched across to the telegraph office for transmission, and where also messages for members are received almost instantaneously from the office. Messengers are on 'Change to deliver dispatches to members. The cost of the enterprise is between $3,500 and $4,000.—*Chicago Journal of Commerce.*

THE TURKISH HOOKAH.

This luxurious pipe of the Orientals is simple in construction, though often made of the most expensive materials. It is, however, generally composed of a red-clay bowl and a cherry stick stem. It washes the smoke precisely as gases are washed in the chemical laboratory, by passing them through water. It not only washes but condenses a great portion of the essential oil which would otherwise pass into the mouth



with the smoke. This oil contains nicotine, a deadly poison, and the active principle of tobacco; therefore the use of pipes of this kind is not so injurious as that of ordinary pipes. Its operation is as follows: The upper part of the bowl contains the tobacco, and a tube runs from it into the lower part, which is half filled with water. When the air is exhausted by "drawing" through the pipe, the smoke rushes down the tube and escapes through the water.

THE velocity of light is so enormous, about 185,000 miles per second, that it can readily be imagined that any motion which we can experimentally produce in a source of light is at rest in comparison.

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