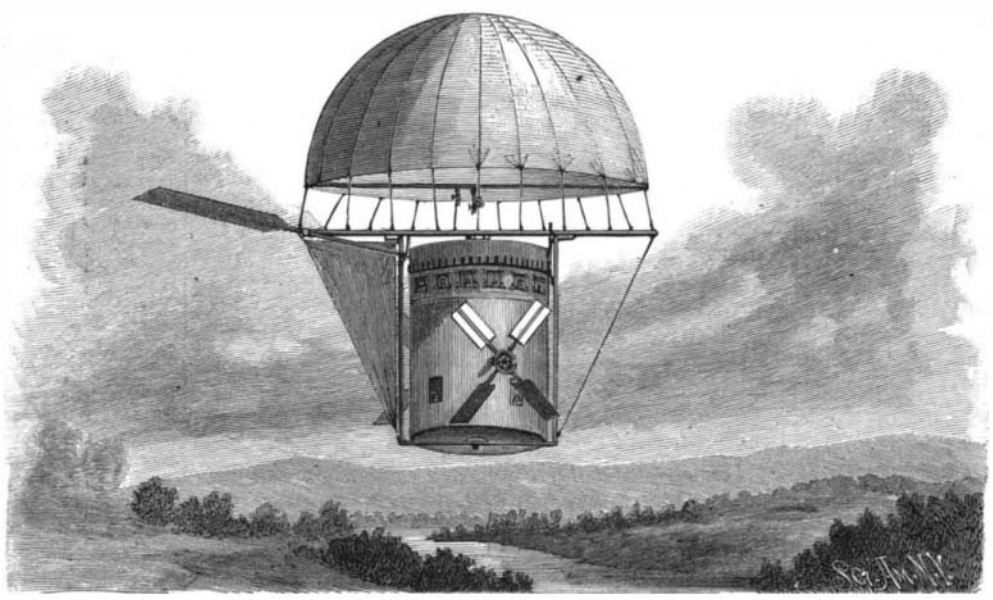
AN AERIAL SHIP.

The construction for navigating the air represented in the illustration is designed to be readily guided and controlled in its travel, irrespective of the direction of the wind. It has been patented by Mr. William N. Riddle, of Crowley, Texas. Its main body is substantially of an upright cylindrical form, and is divided horizontally into two compartments, the lower one for freight and the operative mechanism and the upper one for passengers. The body is centrally pivoted at its upper end to a main frame piece above, the lower end of the body also being centrally pivoted in the horizontal member of a yoke, in which the body is suspended from the frame piece, cords serving as braces. A circular rack, controlled by a spring catch upon the upper end of the body, holds the latter stationary in any required position in traveling around its vertical axis. Connected with the yoke and the stay cord at one side is a stationary rudder, and a laterally projecting second rudder is pivoted to one end of the main frame piece above, this rudder being capable of adjustment up or down, and being locked in position by a lever handle engaging a rack on the frame piece. Attached by cords to the latter is an upper gas receptacle divided into compartments, one above the other, united to form but a single buoyant chamber, but so connected with one another by central upright tubes that if one compartment collapses or bursts the others will hold up the ship. To propel the vessel, a horizontal shaft projects from each side, each carrying two upright partly circular tracks, one below and the other above, between which an upright propelling wheel is arranged to rotate upon the shaft. Each wheel is driven or rotated by gearing actuated by any suitable prime mover or motor within the body of the vessel, and the construction of the wheel is such that the paddles will have a feathering action, striking the air on their flat side during half of the revolution of the wheel and presenting their edge surface to the air during the other half of the wheel's rotation. The construction is such that the position of the wheels may be changed to give their paddles a flat or edge presentation to the air as desired, and to move the vessel upward or downward when necessary, it being designed that in lowering the ship it will not be necessary to permit the escape of the gas in the buoyant chamber.



RIDDLE'S AERIAL SHIP.

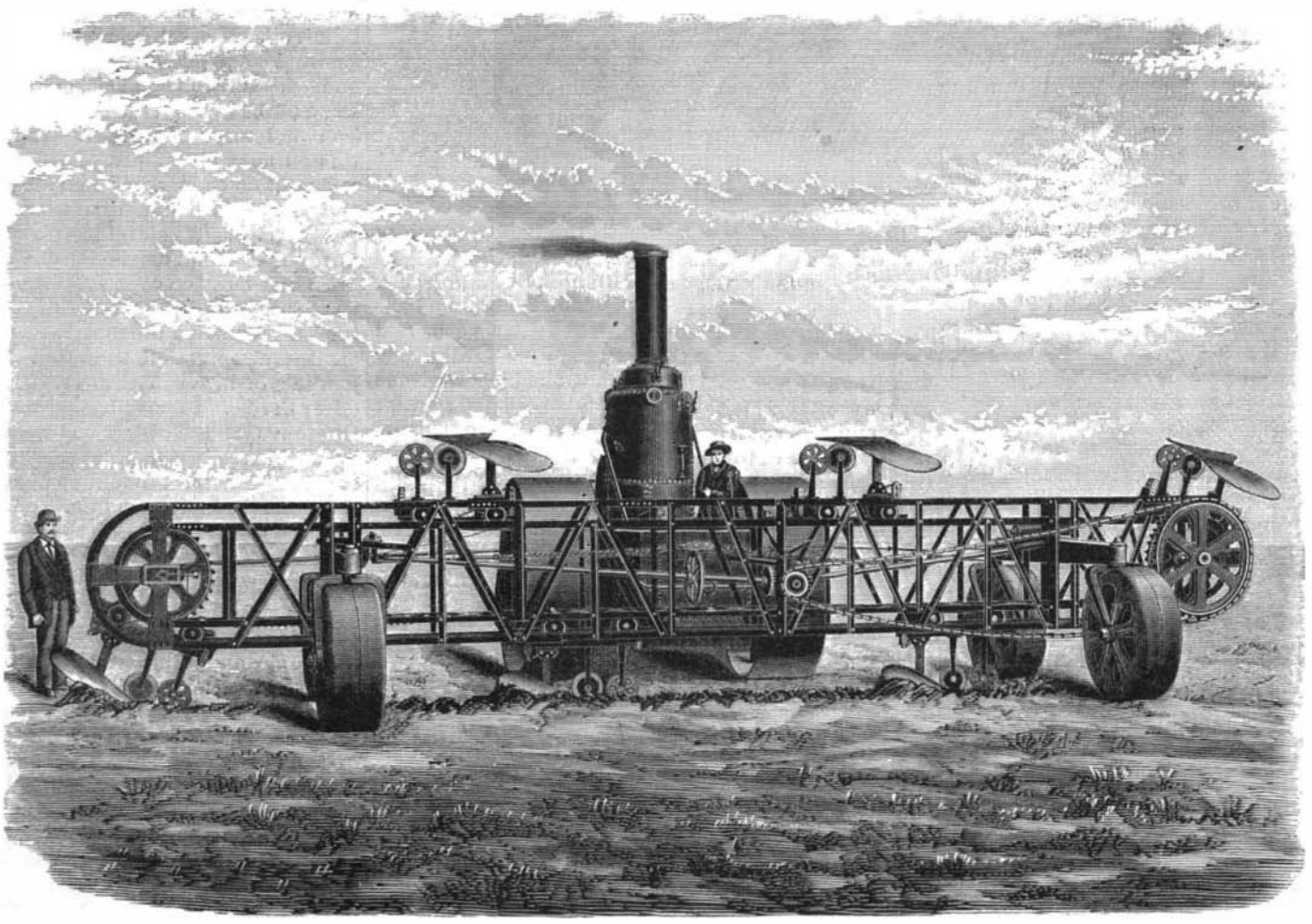
Gold Alloys.

Prof. Roberts-Austen has drawn attention to the fact that the properties of gold are changed in a most remarkable manner by alloying it with small percentages of other metals, and he lately exhibited a new series of alloys of this metal with aluminum. One of these alloys, containing 20 per cent of aluminum, forms an exception to the usual rule that the melting point of an alloy is lower than that of either of its constituents. This alloy has a fusing point above that of gold, the most infusible of its constituents. Curiously enough, the alloy with 10 per cent of aluminum follows the ordinary rule. These alloys have the most brilliant colors. The 20 per cent alloy is a brilliant ruby in tint, while those containing greater percentages of aluminum are purple in hue.

IT is stated that wasps' nests often take fire, supposed to be caused by the chemical action of the wax upon the paper material of the nest itself. This fact may account for many mysterious fires.

INGLETON'S IMPROVED STEAM PLOW.

The accompanying cut, which is from a photograph taken while the machine was in operation, represents the rear view of a steam plow designed and manufactured by Mr. E. Ingleton, of Brantford, Canada, an engineer who has had some 18 years' experience in steam cultivation and steam drainage in England, Germany, and Russia, and with every known system. The apparatus is doing some excellent work, and is not only a working but a commercial success. As much as three acres per hour have been plowed in a most excellent manner, and the average of a day's work may be set down at 20 acres, which is being done at a cost of 45 cents per acre.



INGLETON'S IMPROVED STEAM PLOW.

As will be seen from the engraving, this plow is an entire departure from everything yet attempted in steam cultivating machinery, inasmuch as the plows operate across the track of and at right angles to the travel of the engine. By this means a serious objection has been overcome. In nearly all the attempts of steam plowing made on this continent, the system of direct haulage by traction engines has been adopted. It may be stated, however, that so long as the propelling wheels of a traction engine have to depend upon the loose and ever-changing surface of the soil for a sufficient "grip" to haul a gang of plows, so long will all attempts in that direction prove unsatisfactory. It is admitted that in dry summer weather, when the land is hard and traveling good, a traction engine will haul quite a large gang of plows; but it is different with anything in the nature of a steam plow.

In the Ingleton system the resistance of the plows is against the side of the engine, and does not, therefore, hinder the forward move of the latter. This is the secret of its successful working; for, no matter what the condition of the land, so long as it is fit for plowing, a good traction engine, with suitable wheels, may be made to travel light. To haul a weight behind it, however, under certain conditions of soil is another question.

The main propelling wheels of the Ingleton engine are 7 feet diameter and 30 inches wide, which gives ample "grip" for propelling *itself* over any condition of land, while, owing to the width of the frame containing the plows (thirty-three feet), the engine moves forward at the rate of about half a mile per hour only, or *one-sixth* of the speed required by direct haulage, with a corresponding saving in power, fuel and water and wear and tear. Besides these advantages, it must not be forgotten that, owing to this saving of power in propelling the engine, a smaller engine will suffice to do the same amount of work than when hauling direct, for there will be found some conditions of land that it would take as much power to propel the engine over at the rate of three miles per hour as it would require to haul a gang of plows.

In the Ingleton system the plows travel through the soil eight times faster than the engine, *i. e.*, while the engine is traveling half a mile in one direction, the plows are moving at the rate of four miles per hour at right angles thereto, giving a maximum of work done to a minimum movement of engine.

The width of the plow frame may be doubled if necessary; in fact, it is recommended for large operations. This will further the advantages of this system. There is practically no fixed limit to the width of the plow frame, as each plow is mounted upon a small carriage, with four flanged wheels traveling on rails, and is independent to rise or fall, so as to follow all uneven surfaces of the land. By means of a lever placed within reach of the fireman, the main frame can be raised, and all plows taken clear of the land, with the power of the engine, and without stopping the machinery. The plows are fitted with an automatic apparatus for raising them clear of stones or roots, thus saving all damage from this source.

The main frame can be fitted with a seeder box, and Ingleton's patent harrow, so that the three operations of plowing, seeding and harrowing can be carried on at one time. The time is at hand when a good steam plow is required. It is surprising how little has been done in this direction, when we take into account the elaborate steam thrashing machine, which only deals with two or three tons weight per acre, while to plow an acre of land six inches deep one thousand tons have to be stirred, and that in a very short space of time.

A Great Bridge for New York.

Modified plans have been prepared by T. C. Clarke for the North River bridge, proposed by the New York and New Jersey Bridge Company. The original plans provided for a center pier in the river, but this has been abandoned. The present design provides for a combined cantilever and suspension bridge. The river span will be 3,200 feet. The New Jersey end of the bridge will be at Miles Avenue, the New York City end at a point between the lines of Seventieth and Seventy-first Streets. A viaduct 100 feet wide, with four main tracks and three lines of sidings, will run through private property to a point between Eleventh and Twelfth Avenues, thence to a point above Thirty-eighth and Thirty-ninth Streets. A large union station will be built on the blocks between Thirty-seventh and Thirty-ninth Streets, Eighth Avenue and Broadway.