

a bust has been machined, as it were, it is rubbed over with sandpaper, when it is ready for the market. For architectural display on buildings this additional labor would not be necessary.

Engineers who have inspected the machine declare that the principle can be adapted for wood-carving and chasing silver. Indeed, the owners have already been approached by a well-known London firm of silversmiths, for permission to build an experimental apparatus for silver work on similar lines. The machine is the invention of an Italian ex-naval officer, Signor Bontempi. Receiving much opposition from the Italian studios, he sold the patents to a society, formed of a few foreign and a few Italian gentlemen. They took premises in the vaults of the famous old ruin, the Palace Donn' Anna, at the foot of Posilipo, and set the machine at work. The first statue made was a copy of a Venus in the Naples Museum, which he did so well that the only means of distinguishing it from the model was its whiteness, the original being quite dark. Our illustrations were made directly from photographs, with the exception of one which is a drawing reproduced from the London Illustrated News.

#### Platinum in Southern Oregon.

BY DENNIS H. STOVALL.

This past year the discovery was made that there is much platinum as well as virgin gold in the old channel placer deposits of southern Oregon. Furthermore, the discovery has been made that the platinum can be mined at the same time the gold is mined, and with no additional expense. The platinum of these old channels occurs with the black sand, and is in fact a refractory article, a concentrate, carrying platinum in the free state and gold in a sulphide composition. For years this black sand has been known to exist in the old channel placer beds of southern Oregon, but the miners were ignorant of its identity and value, as well as of any method of saving it, and have allowed it to be carried off over the dump with the waste water.

Through the efforts of the Welsbach Company, of Philadelphia, or their representatives, a method has been devised whereby the platinum of these old channels can be saved. This company experimented for a number of months in the southern Oregon placer fields, and at last hit upon a system that is proving a success. This method of catching and saving the platinum consists simply in adding to the sluice-boxes a system of undercurrents and screens. The screens are of steel, and have one-eighth inch openings. The black sand, or concentrates, are drawn down through these screens, which are placed on the bottom of the sluices, and are then spread out over a broad riffle table, where they settle and are scooped up, ready for the refinery. The placer mines that have installed this system of undercurrents for saving the platinum sands find it a valuable addition of revenue to their regular receipts.

The platinum sand of the southern Oregon old channels is a black, granulated stuff resembling coarse black powder. The small particles of platinum can be easily detected by a close scrutiny, as they have a slight metallic luster. A few platinum nuggets the size of coffee grains have been found, but these are rare. As a number of placer mines are preparing to mine platinum next year, it is likely that the production of this metal will become an important part of the mining industry of Oregon.

#### Origin of the Grain Weight.

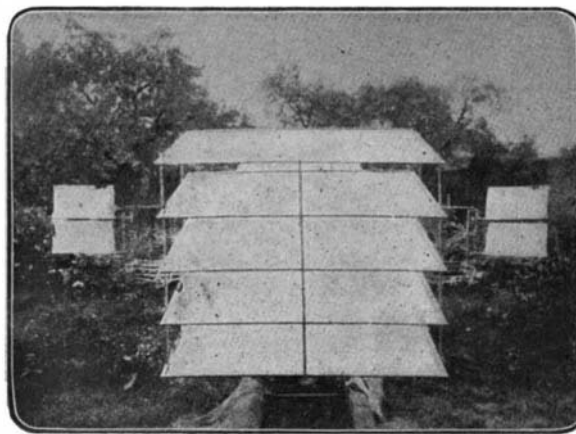
The Druggists Circular and Chemical Gazette publishes the following interesting note on the origin of the grain weight: By an English law passed in 1266, it was provided that a silver penny, called a sterling, should equal in weight 32 wheat grains, well dried, and taken from the center of the ear. From this it seems evident that the grain of wheat was the prototype of the standard grain. The weight now known as the grain is of course copied from governmental standards. In 1826 certain weights and measures were legalized in England, and in 1827 copies of these were furnished our government, among them being the troy pound, equivalent to 5,760 grains.

The origin of the signs commonly used for the scruple, drachm, and ounce does not seem to be known. It is not unlikely that they are entirely arbitrary.

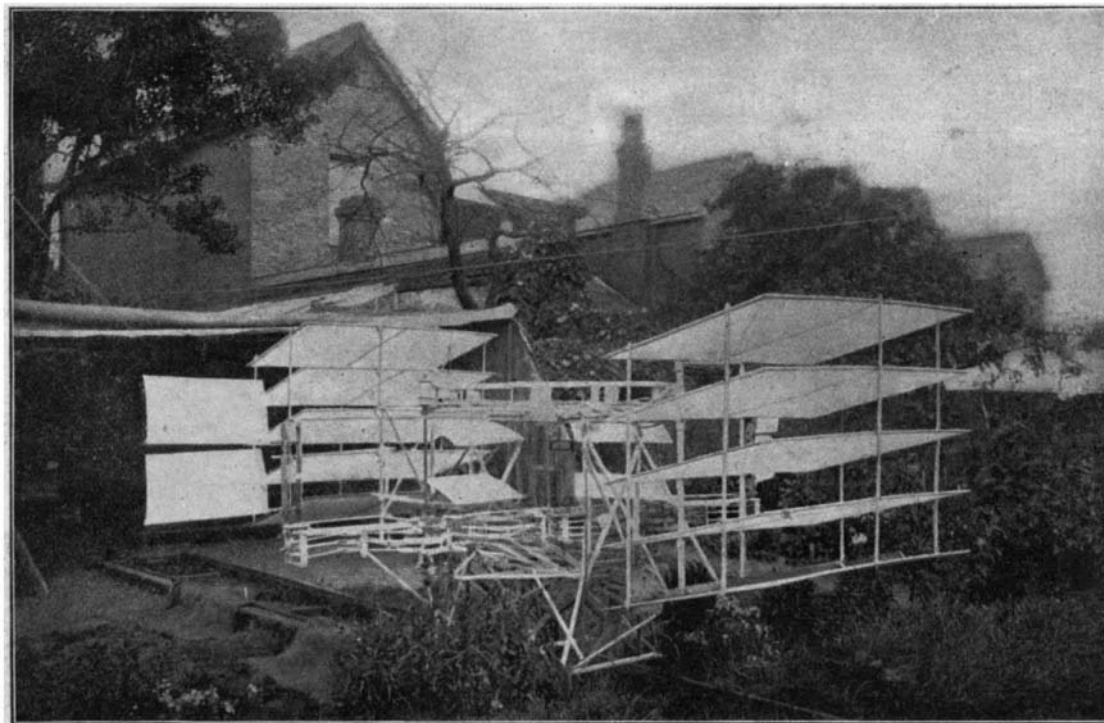
#### A NEW AEROPLANE.

Among the many inventions relating to aerial navigation, that of Messrs. Groombridge and South, which we illustrate herewith, is worthy of consideration, from the somewhat original design of the air propellers with which it is fitted. The accompanying photographs are those of a full-sized model which has been built by the inventor, and it will be seen that the machine itself, which is about 80 feet in length and 60 feet in width, is to be supported upon superposed aeroplanes which are attached to the framework both at the front and rear of the machine, while the propellers, which are six in number, are carried three on either side of the framework. There is also an extra one, not shown in the photograph, surmounting the whole structure.

The framework of the model is necessarily rather heavy, being constructed of wood, but in the actual finished ship a very much lighter construction would be used. The propellers are carried upon arms extending outside from the main or central driving shaft which forms an axis within a rectangle, the two vertical sides of which form axes carrying the vanes. During the driving stroke these vanes extend outside beyond the rectangle, while they return edgewise, or



END VIEW OF THE AEROPLANE.



MESSESS. GROOMBRIDGE AND SOUTH'S NEW AEROPLANE.

in a feathering position, inside it. To make this clearer, it must be understood that during the propelling stroke the vanes become strained backward against the resistance of springs, and as the vanes yield to the air, the latter remains practically normal and becomes an inert or solid fulcrum against which the vanes press, so that, when driving, they are in a vertical position, while at the completion of each stroke they automatically feather. Furthermore, the main central shaft is provided with two sets of vanes, so that one side may be propelling while the other is feathering, keeping the propulsion continuous.

There is no doubt that this new form of propeller is capable of transmitting very considerable power, and the work in connection with the controlling mechanism is now so advanced that it only remains for a properly-constructed ship to be made, fitted with two 20 horsepower internal combustion engines, for a practical trial to be attempted. It must be mentioned that this airship is to be provided with four road wheels in order that it may attain a certain speed along the ground before the aeroplanes are put into action. It is estimated that when this speed has reached about twenty miles an hour the lifting power will then be sufficient to take the aerial navigator off the ground. The experiments with the new aeroplane will be followed with interest, and it is to be hoped that the machine will prove useful.—The Car.

#### Oil of Elæococca—A Natural Drying Oil Obtained in China.

A natural drying oil which is obtained in China and the surrounding countries is the oil of Elæococca. This oil is extracted from the fruit of the oil-tree (*E. vernicia*, cordata, or verucosa) which belongs to the Euphorbiaceæ. This tree grows in China, in the south of Japan and in Cochin-China. The oil is extracted from the fruit by pressing it when cold, and 100 parts of the fruit give about 40 parts of oil. When pressed hot the yield of oil is somewhat larger, about 50 per cent, but its composition is modified and it is strongly colored. This oil was imported into Europe for the first time in 1874. It was first studied by Cloëz, and after that by other chemists who determined its composition and examined its curious properties. It has a density of 0.940 at 15 deg. C., and its color is golden yellow. When freshly prepared it is inodorous, but after a time it gives off a characteristic odor which somewhat resembles that of castor oil of an inferior grade. Its freezing point depends upon whether it has been freshly prepared or not, and varies according to circumstances from -3 to -20 deg. C. It is soluble in the usual solvents for fatty substances, except alcohol, which must be boiling to dissolve it. The oil has 72 per cent of fatty acids and it can be completely saponified. Below 18 deg. C. it is very clear and limpid, but above that temperature it tends to thicken without losing its transparency. One of its curious properties is that of solidifying when heated to 200 deg. C. It then assumes a jelly-like appearance. This phenomenon is due to an absorption of oxygen from the air. On the contrary, when this temperature has not been reached and when the oil is heated for some time at 180 deg., it loses the property of solidifying at 200 deg., as its chemical constitution is absolutely modified.

The most useful property of the oil is that it is a natural drier, and this property is strongly marked. It is due to the absorption of oxygen from the air. This oil is a better drier than all others known, and when spread upon a polished surface such as glass it quickly solidifies in the form of a colorless film. When placed in a sealed glass tube and exposed to sunlight it is transformed into a solid mass whose melting point is 32 deg. C. The oil is a highly refracting body and it seems that the shorter wave lengths act to cause the transformation. In China and Japan it has been used for a long time past to cover the wood which is used for boat-building and like purposes. A fine varnish is made with it which dries quickly and has a brilliant luster. The French consul at Canton states that it enters into the composition of Chinese lacquer. Besides its use for varnishes, it is also employed for waterproofing different fabrics. In Europe it has often been substituted for linseed oil for obtaining certain varnishes. When treated by litharge and then dissolved in turpentine, an excellent varnish is obtained which is quite transparent, and this without the addition of resin. As linseed oil is

generally of a dark color it is difficult to prepare light colors or varnishes with it, and therefore the use of this oil is to be recommended. In China, Japan, and Cochin-China, the annual production is about 2,800 tons. It is exported to Germany, America, and England, but it is only since 1896 that it commenced to be exported in considerable quantities. In 1897 the exportation to the three countries mentioned above was about 70 tons.

W. Ackroyd has found that radium bromide induces phosphorescence in common salt at ordinary temperatures. The phenomenon may be observed as follows: A wooden match box is filled with table salt removed from the inner portion of a block; a tube of radium bromide is pressed into the yielding mass and just covered with the substance. If it be now put on one side for a few hours, say into one of the compartments of a chest of drawers, on opening the box in the dark the tube will be found to phosphoresce all round with a white light, but, unlike zinc blende and barium platinocyanide, the salt continues visibly to phosphoresce after removal of the radium bromide. The portions of salt round the tube are turned of a faint buff or ochre tint. The image of the visible portion round and where the radium bromide tube has lain is impressed on a photographic plate in thirty minutes.—Nature.