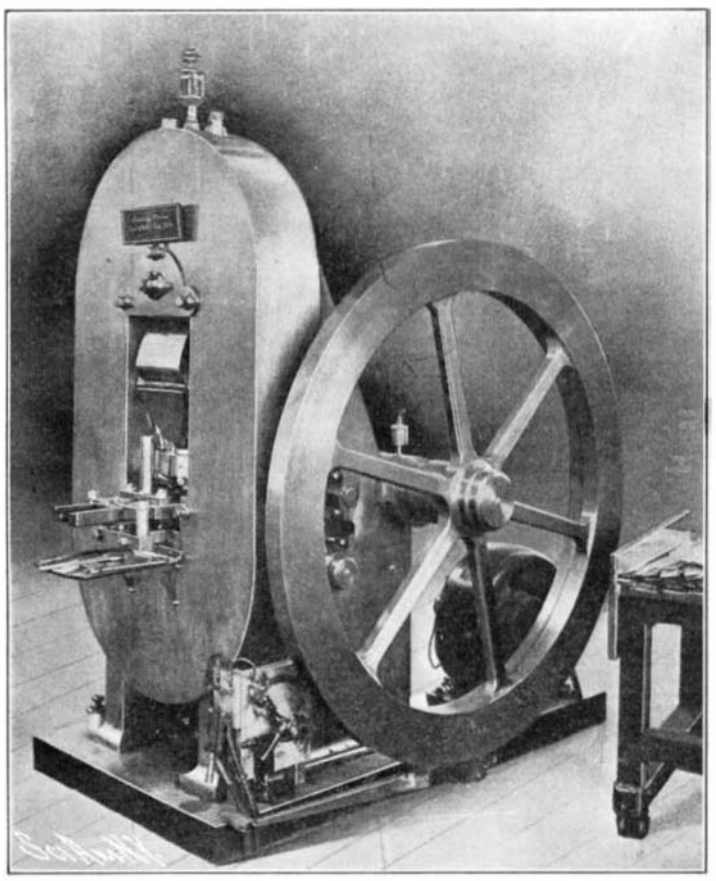
THE UNITED STATES MINT AT THE ST. LOUIS EXPOSITION.

BY THE ST. LOUIS CORRESPONDENT OF THE SCIENTIFIC AMERICAN.

The most popular section of the exhibit of the United States Treasury Department in the Government Building at St. Louis is an exhibit by the United States Mint of the complete process of coining money. This includes every step, from the melting of the metal to the coining of the money, and a touch of rare historical interest is given to the display by placing in close juxtaposition to the most modern coining press a fine old relic in the shape of the first press used in the United States Mint. The old press, which is an exceedingly crude affair of wood and iron, was probably used only for the stamping of small coins. The hammer and the small scale which were used for assaying purposes, that are seen on the machine, are known to be of the same date as the press. The die rests in the bottom on the wooden frame, and the centering was done by four side screws. The upper die was placed in the center at the bottom of a screw with a very rapid thread, which was operated by a long cross-bar, as shown in the engraving. The lower die was then centered by means of the four screws to match the upper die. A remarkable fact about the old relic is that it has been continuously in use up to January last in the making of cupels. The machine was hand-fed and, of course, its capacity was very limited. The new machine, shown adjacent to it, forms part of the modern plant comprising the exhibit. It runs at a speed of ninety revolutions per minute, and has a capacity of ninety large pieces of money in the same time. The blanks to be coined are placed in the vertical cylinder seen just in front of the dies, and the pieces are taken out from the bottom by automatic metallic fingers, which place them forward on the die, ready to receive the impression. The smaller-sized presses, which are used for ten-cent pieces, have a capacity of 120 impressions per minute. The machine is run by the small motor, which will be noticed bolted to the foundation to the rear of the flywheel. The switch and controller are located in the front of the machine conveniently to the operator.



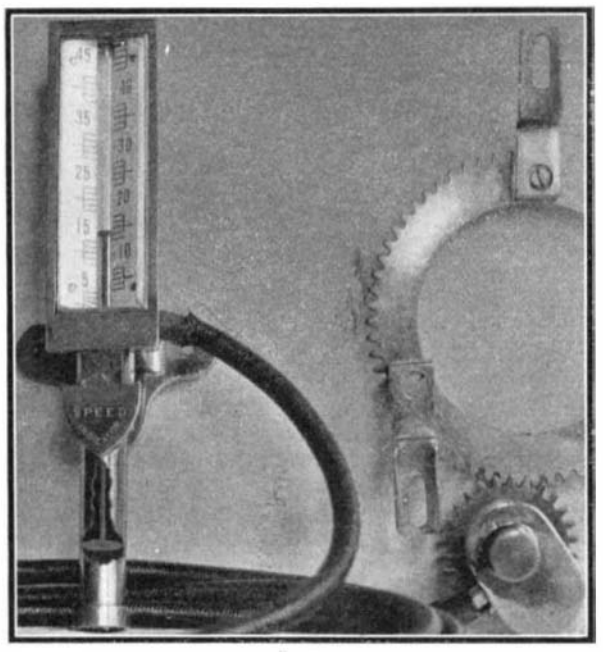
MODERN UNITED STATES COINING PRESS.

The first operation, that of melting, is carried on in a furnace fired by naphtha gas. The charge of 90 per cent of gold and 10 per cent of copper, or 90 per cent of silver and 10 per cent of copper, as the case may be, is placed in a plumbago crucible, and melted in about an hour and a half. It is cast into cast-iron molds containing two ingots in each. Samples are meanwhile taken to the Assay Office, and if the report is favorable, the metal is passed on to the Coining Department. The ingots, which measure one-half inch in thickness by an inch and a half in width, are then given fifteen passes through the rolls, until they are reduced to the desired thickness for the coin; this, in the case of a $20 gold piece, is 83/1000 of an inch. This process of annealing is a very important one, and has to be carefully watched; and it should be noted that the metal is rolled down to weight and not to thickness. The process is continuous, the strips of metal being fed slowly through a furnace in which the temperature is about 1,000 degrees Fah. As they emerge from the furnace, the strips are cooled by a spray of water. It is an interesting fact that the composition of the metal is such, that the spraying does not have any hardening effect upon it. The metal strips are now taken back for a final rolling, which is done under a comparatively light pressure. Then the strips are carried to the punching machine, where the blanks are punched out at the rate of 200 per minute for $20 gold pieces, and, of course, at a much higher rate for the smaller denominations. Next the blanks are placed in a machine where the edges are upset, this process serving to give to the edge additional hardness. Then to correct any brittleness imparted to the metal by the foregoing manipulations, the blanks are annealed in a cylindrical gas furnace, where they are caused to travel through a spiral-shaped passageway, each blank taking three minutes to pass through the furnace. The next process is to put the blanks through a bath of sulphuric acid, after which they are washed and dried in a barrel-shaped revolving machine, known as a "riddle." They are then taken to the coining press above described.

The whole of this very interesting machinery was built at the Philadelphia Mint, and at the close of the St. Louis Exposition it will be taken to Denver, and installed in the new United States Mint at that city. On account of the great cost of its installation and operation, it is probable that the present exhibition is the last of its kind that will be made by the United States government.

A NOVEL SPEED INDICATOR FOR AUTOMOBILES.

The device illustrated herewith has been recently perfected and placed on the market by Mr. Hartwell W. Webb, a young inventor of this city, who is possessed of a good technical education coupled with considerable ability. Mr. Webb's idea was to construct a speed indicator that could be used on automobiles and for other purposes, and which would have no parts to break or give out under severe usage. How well he has succeeded can be seen from a glance at the picture, which shows, at the left, the instrument, and, at the right, the parts that are placed on and near the wheel, while the rubber tube is shown in a coil, connecting them. The substantial ring shown is attached to the wheel of the automobile by three clips having oval slots, which make it easy to properly center the ring. A small gear pump is driven by an exterior bronze gear meshing with the teeth of the ring, as shown. This pump draws air in through three small holes in the bottom of the tube of the indicator, the exit for the air being through an outlet where the rubber tube is attached. The suction created by the pump raises a light aluminium plunger half an inch in diameter and weighing 5¼ grains, and the upper end of the plunger rod indicates the speed in miles per hour upon the scale. The bore of the plunger tube increases slightly toward the top, so as to make the air current always raise the plunger proportionally to the increase in speed. The extreme simplicity of the apparatus is apparent. There are no mechanical parts to get out of order or no liquids to leak out in case of breakage. A flexible driving shaft is not required between the wheel of the automobile and the indicator, all that is necessary here being a rubber air pipe. Besides its simplicity, the instrument is accurate, and its readings are correct to within two per cent. It begins to indicate at as low a speed as two miles an hour, and it indicates, without perceptible deviation, from that up to the maximum. The index never oscillates no matter how rough the road, and it is perfectly balanced in all planes that it is likely to be moved into in practice. A suitable hinged bracket for attaching the indicator to the dashboard makes it possible to tilt the device so that it can be easily read from the seat. The scale is sufficiently large to be read at a distance of twenty feet, and the indicating plunger of aluminium tubing is painted scarlet and arranged to move up and down in a glass tube placed behind the beveled glass front. The only wearing part is the gear pump, and this is exceedingly well constructed, the shafts of the two gears running in long, dust-proof bearings and one of the gears being made hollow so as to contain oil enough to last one thousand miles. The recent advent of high-speed steels into the manufacturing world has rendered necessary some means of gaging cutting speeds without the computation required by the use of a counter and stop-watch. A portable variation of the Webb speed indicator has been arranged to give at a glance from a single index both the peripheral speed in feet, and the number of revolutions, per minute. The blower and indicator are each provided with a handle, the blower being held to the work with one hand, while the indicator is brought to the level of the eye with the other, a flexible tube connecting the two parts of the apparatus. The indicator in this instance has a different scale on each side of the center tube, one indicating feet per minute, and the other revolutions per minute. Besides this instrument, a stationary tachometer is also made for power and electric light plants, and a shaft speed indicator for vessels and automobile boats is in course of preparation. All types of this new instrument are being placed on the market by the Webb Company, Park Row Building, New York.

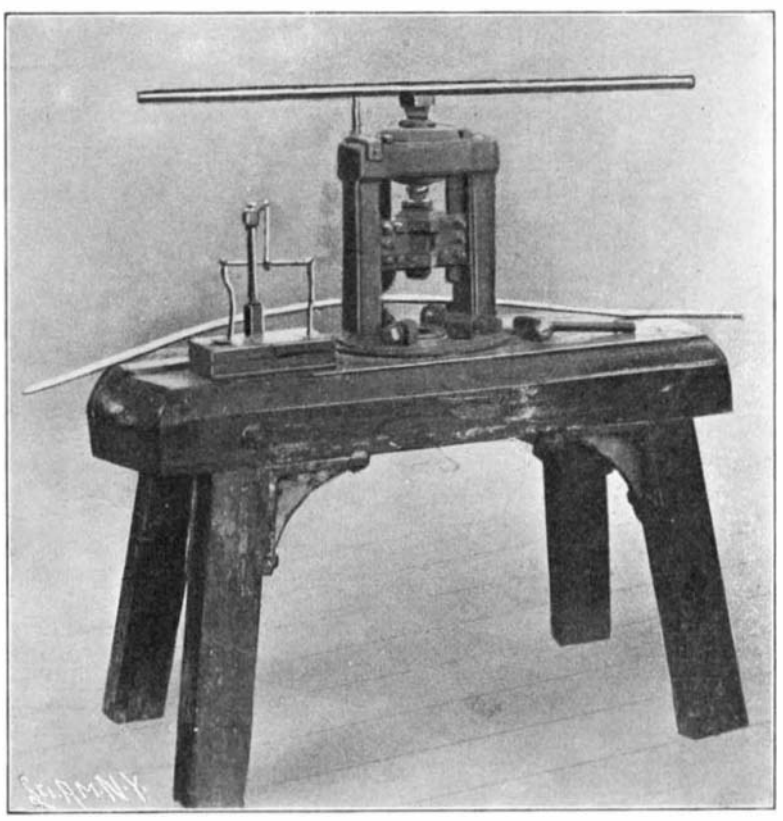


A NOVEL AUTOMOBILE SPEED INDICATOR.

Baldwin's Successful Flight.

With A. E. Knabenshue, of Toledo, Ohio, in the basket, Capt. T. S. Baldwin's airship flew through the air at St. Louis October 25, in the face of a ten-mile breeze, at the height of half a mile for a distance of about ten miles. Baldwin's airship was described in a recent number of the SCIENTIFIC AMERICAN. Several accidents occurred during the trip, the more serious of which was the breaking of a chain, which caused the operator to open the gas valve, bringing the craft to the ground.

Andrew Carnegie is now the recipient of one of the greatest honors in the industrial world, for the Bessemer medal has been conferred upon him. It is given only to those who are prominent in the iron and steel industry. This medal was established in 1873 by the great English iron-master from whom it is named.



FIRST COINING PRESS USED IN THE UNITED STATES MINT. OVER ONE HUNDRED YEARS OLD.