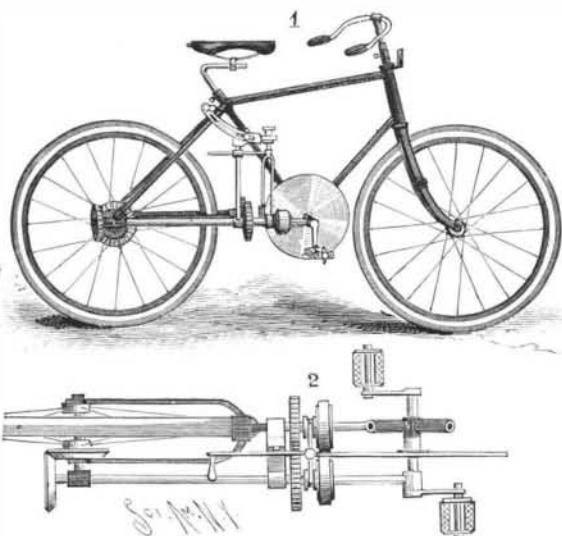


**A VARIABLE DRIVING GEAR FOR BICYCLES.**

The illustration shows a simple construction of variable driving mechanism by means of which a bicycle may be driven slowly with great power, as necessary in going up hill or over rough roads, or may be pro-



**EISENHART'S VARIABLE DRIVING GEAR FOR BICYCLES.**

pelled with greatly increased speed, as is desirable on good and level roads, without changing the speed of the pedal shaft.

The improvement has been patented by Mr. Samuel C. Eisenhart, of York, Pa., P. O. Box 72. Fig. 1 illustrates the application of the improvement to an ordinary safety bicycle; Fig. 2 being a plan view. On the pedal shaft is a friction disk whose sides may be

covered with rubber, leather, or similar material, if desired, and this disk is engaged by friction rollers keyed to and sliding on horizontal shafts supported in ball bearings carried by the main frame.

The shafts are connected by meshing gear wheels, and the shaft on one side serves as a driving shaft, extending backward to the hub of the rear wheel, with which it connects by bevel gears.

The friction rollers have grooved hubs in which fit the prongs of a fork, whose upper end is coupled to a curved and longitudinally slotted plate having at its rear end a handle within easy reach of the rider.

The plate rides on a flanged guide roller held in the slot of the plate and fulcrumed at one side of the frame, and the fork is further guided and braced by a guide bar, which slides in a bearing or sleeve at the upper end of a post having feet journaled on the shafts which carry the friction rollers.

In propelling the machine, as the rider moves the friction rollers in toward the hub of the disk the speed diminishes, the reverse movement increasing the speed, the rollers being moved by grasping the handle and pushing the plate backward or forward as desired.

The invention also provides for a lighter form of driving gear in which only one friction roller is employed.

**Milk Tickets as a Medium of Infection.**

In an ordinance recently adopted by the council of Menominee, Mich., to regulate the selling of milk, a good point is made in giving protection against possible infection through the medium of milk tickets.

Section 11 provides that "No licensed milk dealer

shall receive compensation in tickets from houses or premises which are placarded by the health officer until such placard has been removed, and all tickets found by such licensed milk dealer in such houses shall at once be destroyed by burning the same and new tickets issued in place of such as shall be found in infected houses. All milk tickets shall bear date of first use and be destroyed within three months."

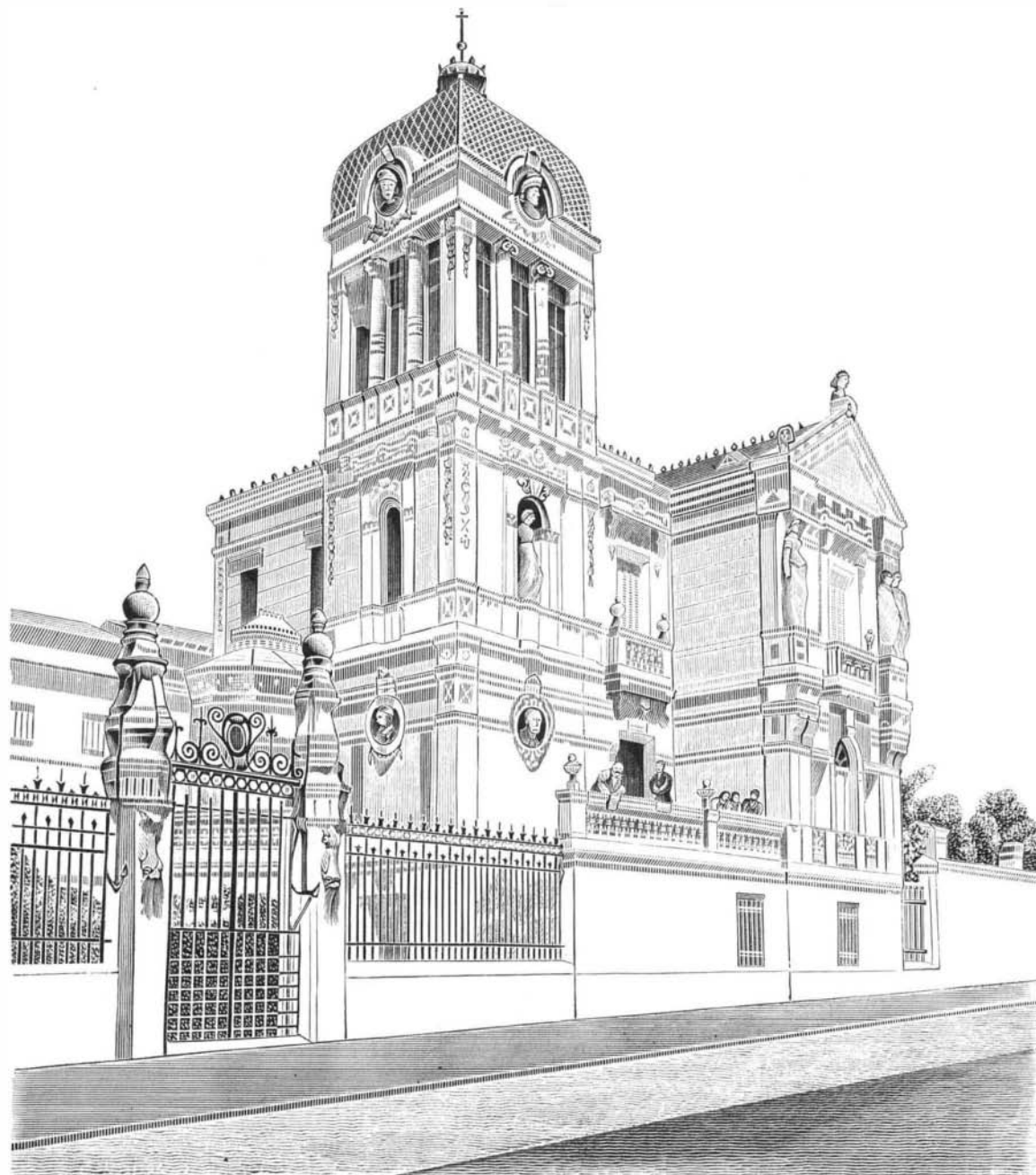
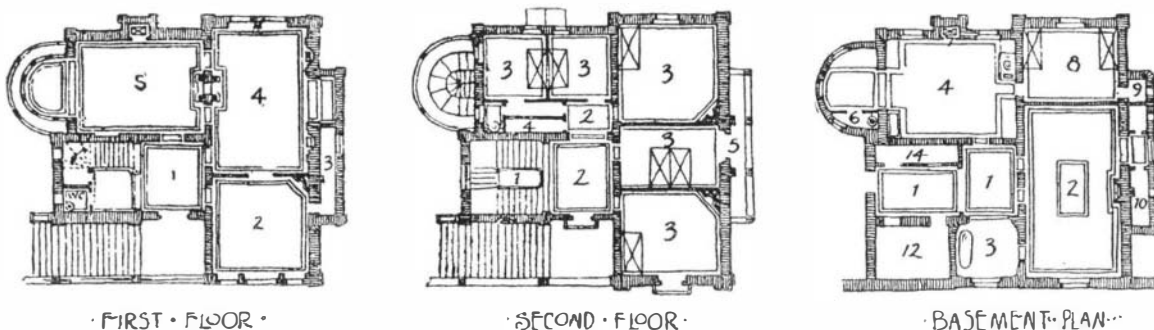
What about soiled milk tickets or fouler money being left in the empty milk pails for the milkman?

This is in line with the action of the health authorities of Urbana, O. An order has been adopted prohibiting the use of theater tickets brought from some other city, the manager of each troupe being compelled to issue new tickets for the people of Urbana.

It is certainly well that every possible avenue of contagion should be guarded as closely as possible; but what is to be done with our dirty paper currency?—*American Analyst.*

**The Mystery of Mind.**

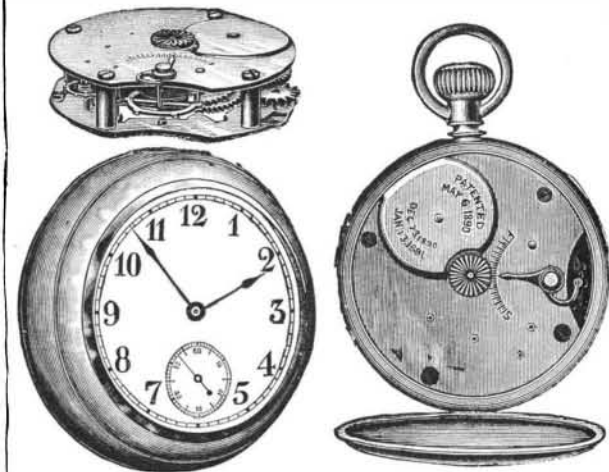
Mr. Lester Ward, in a lecture on the "Status of the Mind Problem," recently delivered before the Anthropological Society of Washington, showed that the work of Ramon y Cajal and others indicated that protoplasm is not merely the physical basis of life, but is the physical basis of mind also. In his words, "the prevailing fashion among scientific men of emphasizing the 'mystery of mind' is unnecessary and illogical, since mind is no more a mystery than matter, and all that there is any ground for confessing is that, in consequence of the greater complexity of mental phenomena, due to the higher state of development of the material basis of mind, we possess as yet much less knowledge of them than we do of many of the simpler phenomena of nature."



**HOUSE OF SENOR SARACIBAR, ARCHITECT, SALAMANCA, SPAIN.**

**A LOW PRICED STEM WINDER.**

The watch shown in the accompanying cut has been selected to illustrate the extremely low cost at which the modern American watch, with all the latest improvements, may be produced. This watch is put on the market by Messrs. R. H. Ingersoll & Brother, of 65 Cortlandt Street, New York, at the extremely low



**THE "CLIMAX" WATCH OF R. H. INGERSOLL & BROTHER.**

price of \$2. It is a stem winder, while the setting arrangement is shown in the cut in the center of the plate.

The regulating device does not differ from that usually employed in high priced watches. The movement itself is a three-quarter plate, quick train, American lever movement. The short wind is one of the valuable features of the watch. The watch is extremely light, weighing only 3 3/8 ounces, will run 30 hours with one winding, and is incased in a gilt or nickel case, plain or chased. A well made chain accompanies each watch. A general idea of the appearance of the watch may be obtained from our engravings, which are three-fourths actual size.

Over 1,400 watches are produced daily at this factory, or between two and three watches a minute, during working hours. It seems very extraordinary that a real watch can be produced, which is capable of regulation, so that it will keep excellent time, for such a small sum of money. The "Climax" watch is guaranteed to run satisfactorily to the purchaser for one year. It is a watch that ought to suit everybody.

**HOUSE OF SENOR SARACIBAR, ARCHITECT, SALAMANCA, SPAIN.**

A recent number of the *American Architect* contains a sketch and description of a newly erected house in Salamanca, which we here reproduce as an example of recent Spanish architecture in the line of private residences. Our cotemporary says:

In the broad and aristocratic district of Salamanca, and at the end of Claudio Coello Street, has been erected an elegant and artistic house, called "Villa Bilbao," which was designed for his own occupancy by Senor Julius de Saracibar, a well-known Spanish architect, who has passed the best part of his life erecting and embellishing the dwellings of many other persons, and has at last been able to construct his own, being able in it to display his genius and his skill as a constructor.

This residence occupies

an area of about 8,000 square feet. It is difficult to distribute this space with more dexterity, for on this lot the villa has been built with an ample and marbled exterior *escalinata*, garden, small lake, grotto, kiosks, stables, departments for straw, a greenhouse and other accessories, all arranged so that nothing becomes a hindrance—everything is seen and everything is isolated.

In this abode, all the rooms are large, with high ceilings, profusely lighted and ventilated, with great economy of the land. The access to the property is from Claudio Coello Street, by a large and wide entrance between pillars decorated with allegorical details dedicated to the unconquerable city of Bilbao and to its famous siege.

The ground floor has its access at the level of the garden, but the floor is raised more than a meter above this level, profiting advantageously by the slope of the site and freeing the rooms from the humidity of the adjacent plantations; it contains the billiard room, bath room, kitchen, pantries, larders, lavatories and servants' rooms.

The first floor is approached by a commodious staircase, and from the exterior by the wide *escalinata* that we have already mentioned; this floor contains Senor Saracibar's studio, the large drawing room, the dining room, with a charming "rotunda" on the side of the garden, a hall and the beautiful staircase that goes to the second floor; in the latter are the bed and other rooms, all with direct light and with all the best conditions of sanitary and commodious arrangements; rooms for servants and for domestic services are provided in the roof, and a pleasant and isolated study room is at the top of the turret.

We will not fatigue our readers with an exact account of the magnificence and elegance of the ornamentation of these rooms. But we think it is our duty to attest that everything that is seen in this residence, from the ironwork of the doors to the carved furniture, from the curtain to the enormous chimney, the mosaic of the floors and the painted ceilings, everything has been made after the designs and under the direction of the proprietor, and everything shows the seal of the artist.

The pediment is crowned by a colossal head of the "Genius of Art." In the tympanum are sculptured the emblems of architecture, with branches of laurel and oak round them, and the heraldic shield of Senor Saracibar is suspended in a prominent place of the facade.

Forming part of this block of the building, follow at its left side and parallel to the public road other two blocks in the center of which is the entrance door, and above, on the same axis, a window; in front of the door there is a small terrace to which leads the broad *escalinata*, of which the balustrade is in the line of the street, adorned with openwork metal and vases in a very good taste.

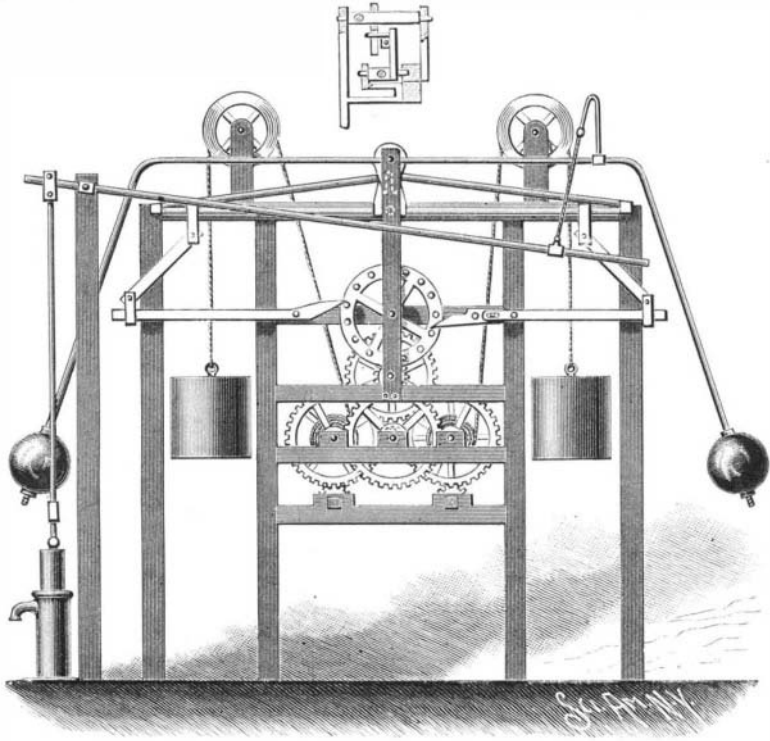
The other block on the left side is formed by the square tower so characteristic in Spanish construction. There was in it a problem of no easy solution; in its large massiveness there were larger surfaces of the building that had to be decorated with sobriety, but in harmony with the rest of the work. A colossal bust and a statue have been enough to decide the difficulty with dexterity. The first is that of Michael Angelo Buonarrotti and the second the Venus of the island of Melos.

The tower terminates in a belvedere, and in the middle of the cornice is a colossal bust of Apollo, the god who presides over the fine arts.

What is particularly worthy of notice in this house is the economy of the materials of construction and the employment of one very seldom used in Spain. The architect has striven to give the walls the precise thickness that may correspond to the necessary condition of stability and resistance, and where walls are suppressed he replaces them with iron columns or pilasters, pro-

perly spaced; this allows him to use thin walls, and to leave others open without complicating the construction; he abandons altogether all vertical wooden beams, and so economizes all the space he can.

The material is the "sable mortier colore," made by M. Charles Stocker, Paris. It is an artificial stone of very good quality, that can be kneaded easily, and is furnished ground or in powder so that it can be moulded, the same as gypsum; it acquires later a great hardness. The walls are dressed with it, and mouldings, statues, adornments, and all sorts of high and low reliefs can also be made with it. Employing this stone mortar, it is unnecessary to paint the walls, and the



WHITAKER'S NEW WEIGHT MOTOR.

color it acquires is more uniform than can be secured with any sort of stone. All the walls of the facades and all the work of sculpture of this villa have been made with it.

Artificial Marble.

M. Moreau produces an artificial marble from ordinary limestone in the following way: The stone is first carved into the required shape, and is then immersed in a bath of soap and a kind of varnish, which is floated on water and picked up by the stone. The stone is then immersed alternately in a bath of iron and copper sulphate, which permeates the body of the material, and when the absorption is complete the stone is immersed in hot water, which drives the coloring matter to the very heart of it. After this the stone is placed in a bath of zinc sulphate, and on being removed, after a few hours' immersion, is found to have the consistency and the specific gravity of marble. It is then dried in a warm chamber, after which it is ready for polishing.

WHITAKER'S NEW WEIGHT MOTOR.

The cut illustrates a clock-work mechanism designed to execute the heavier kinds of work, such as working pumps. The power is furnished by the two weights shown, one on each side, ropes from which are carried to and are wound around two drums, which form part of clock-work mechanism, with pallet wheel and escapement. Immediately below the wheels attached to the power drums are pinions with square-headed shafts, on which handles can be placed, and which are used to wind up the weights. The frame which carries the two pawls engaging the 'scape wheel is pivoted directly in a vertical line above the axle of the 'scape wheel, and as tooth after tooth of the wheel passes a pawl the frame rocks like the walking beam of a steam engine. Thus, as long as weights descend, the walking beam keeps up its motion. By an upwardly projecting arm, slotted, and attached to its axle, the motion of the walking beam is imparted to a bent pendulum rod, carrying pendulum bobs at its lower ends. As this rod swings back and forth, it moves, by a working arm, the pump brake, and operates the pump seen on the left side of the cut. Jerks and shocks are provided against by the use of a chain or other flexible connection between pump brake and pendulum rod.

This invention has been patented by Mr. Albert G. Whitaker, of La Porte, Ind.

UNDERGROUND CONDUCTORS FOR ELECTRIC STREET RAILWAYS.

The dangers and disfigurements occasioned by the overhead trolley wires, now so commonly used in this country, are well known. It is claimed by the managers of these railways that the overhead arrangement of the wires is necessary for the successful operation of the roads, and that no economical or practical system of underground conductors has yet been discovered. But this is far from the truth. There is no practical difficulty in placing the conductors

underneath the track, where they are entirely out of the way and can do no harm. Roads thus provided can be worked with the same economy as the overhead trolley; the only difference is a somewhat increased first cost in the building of the road. But this is nothing when we consider the better security afforded to the public against loss of life and obstruction of the streets. The ugly telegraph and telephone poles are being removed from the streets in all our principal cities, and the time has now come to include the removal of the overhead trolley wires and their posts. One of the most successful examples of the underground electric system is seen in the operation of the Buda-Pest street railways, which ramify in all directions through that city. These railways have been in operation for several years, and their success, both from an electrical as well as financial point of view, is beyond question. We give an illustration of one of these lines, for which and the following particulars we are indebted to the *Railway World*. Considerable prominence has, per-

haps deservedly, been given of late months to the system and details of the electric tramways operating in the capital of Hungary, and this for several reasons. In the first place, the Buda-Pest lines are, in respect of their permanent way design, quite unique, for there seems (at any rate in Europe) to be no other tramway that is operated successfully or practically by means of an underground conduit in which are placed the electric conductor wires. Secondly, the question of telephonic disturbance, due to electric tramways, has come prominently forward, and the Buda-Pest tramways have been cited as an example of the method most likely to give satisfaction to all parties concerned.

Yet another reason for the display of public interest in these lines may be given. As already noted in these pages, a prize of no small value has been offered by tramway authorities in the United States to the inventor or engineer who shall devise the best and most



THE BUDA-PEST ELECTRIC STREET RAILWAY.