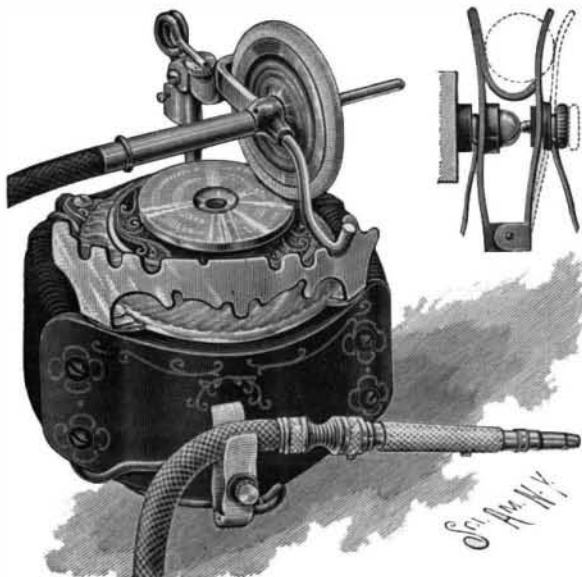


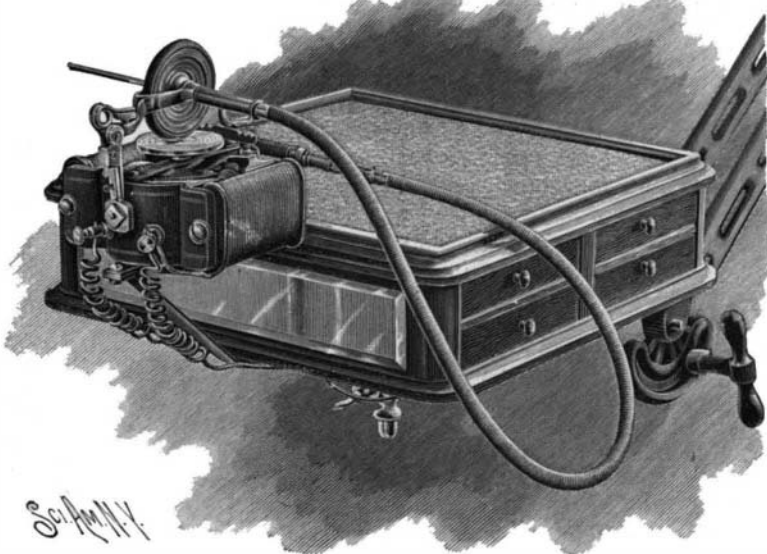
## AN ELECTRIC DENTAL ENGINE.

The dental engine shown in the accompanying illustrations is designed to materially lessen the labor of the operator, who can, by the use of this improvement, at all times stand on both feet and work from each side of the chair with the utmost freedom. The invention has been patented by William E. Wheeler, D.D.S., No. 128 Lexington Avenue, New York City. In one of the views the engine is shown in operative position on the bracket table. The armature runs vertically between the field magnets, its shaft being cone shaped and fitted in a cone bearing at the lower end, while on its upper end a plane-face wheel, slightly dished in the center, is detachably secured. At one side is a socket-like bracket, insulated from the motor



WHEELER'S ELECTRIC DENTAL ENGINE.

body by rubber washers, and in the socket turns the vertical stem of a standard with which is connected a horizontal arm normally pressed downward by a spring. The outer end of the arm is bifurcated, and in the members are journaled the drill-operating spindle, on which is a friction wheel with a rubber rim contacting with the plane-face drive wheel on the upper end of the armature shaft. One of the members of the bifurcated arm has a downwardly bent extension adapted to engage a notched segmental support, and by lifting the arm and shifting the friction wheel toward the periphery of the drive wheel, the speed is increased, while by shifting the friction wheel toward the axis of the drive wheel the speed is proportionately diminished. By moving the friction wheel to the opposite side of the drive wheel the direction of rotation is reversed, and when the friction wheel is held centrally over the dished portion of the drive wheel, the rotation of the spindle ceases. A threaded extension on one of the bearing arms receives the internally threaded sleeve to which is secured the cable, in which is the flexible shaft of the drill, and on one side of the motor is an automatic switch and cable rest, shown in the small figure. It consists of a pair of spring clasplike arms, with which are connected the + and - terminals of the circuit wire. The arms are separated when the cable is supported in the rest, as



DENTAL ENGINE ON BRACKET TABLE.

indicated by the dotted lines, the circuit then being broken and the motor stopped; but when the cable is lifted out of the rest, as would be the case when work is being done, the terminals contact, close the circuit and set the motor in operation.

A PLUMB-LINE suspended a few feet from the side of a large building inclines a little from the perpendicular, because the weight is attracted by the edifice.

## Guns and Bicycle Tires Made of Paper.

The wonders in the use of paper and wood pulp seem not likely to cease soon. The latest application of paper is for the manufacture of large guns. Guns have been made from leather pulp, and these are bound with hoops of metal. The leather pulp is, of course, hardened. There is also a core of metal set inside of the gun. The lightness of the leather cannon is an essential feature. The principal aim, however, is to secure a material which has some elasticity, so that the force of a heavy discharge will be broken gradually. This seems to be obtained in cannon made from a pulpy substance. Paper pulp answers the purpose, as numerous trials and experiments have proved; it possesses more elasticity than metal, and when hardened, is nearly as tough, hence this material is useful in the manufacture of articles requiring hard, efficient and elastic properties.

The body of the gun is made of paper pulp. The core is of metal, and made very much like the cores of ordinary cannon. The exterior of the cannon is wound with wire. About five layers of copper, brass or steel wire are firmly wound on, thus binding the cannon. Outside of the covering of wire are various bands of brass. These bands are set with uprights, through which rods extend parallel with the gun. There are lock nuts on each side of the uprights, and these hold the rods in place.

The Western Stationer states that a new bicycle tire is being tried, built on the compartment plan. The arrangement is such that a series of chambers are produced in the tire, each independent of the other, so that in case the tire is punctured with a tack or a sharp piece of glass, only part of the tire will collapse and the rider of the wheel can continue on his journey. If a pneumatic tire is punctured now, the entire tire will collapse wholly, and the machine is useless until repaired. The new tires are made of pulp produced from paper stock, and are of sufficient durability to permit usage on carriage wheels as well as bicycles. It is claimed that the tires manufactured on the compartment plan are as easy riding as the most elastic rubber pneumatics.

## The Wheelwoman: French.

The learned Dr. Championniere, member of the Academy of Medicine, who has given minute and protracted study to the French wheelwoman, enlightens the world with the results of his observations. The Frenchwoman has used the wheel for four years, a term sufficient for the development of some definite results and for the laying of foundations upon which forecast of further development can reasonably be erected. The first and specially interesting fact is that women are better performers than men. That is to say, they learn more easily and operate with less purposeless expenditure of power. The faculty or gift in virtue of which they do this is the same as that through which they dance more gracefully than men, are apter at the lighter acrobatic feats and excel in all the rhythmic reflex movements of industry. The woman, moreover, has a keener enjoyment of the wheel, attributable to this same quality in her organization.

This kind of use of the wheel has nothing to do with the mere feats of endurance and muscular strength that are involved in competitions and contests. In those, men surpass women as they do in corresponding feats of athletics. Among the observed effects of the use of the wheel by women, Dr. Championniere observes a marked increase in the amount of muscle developed all over the trunk of the body, especially about the torso. The lung capacity increases in a notable way, and above all, the full, healthy action of the heart, which is usually deplorably impaired in the average woman in easy circumstances, is so completely restored as to leave nothing to be desired. The deposition of fat, which is described as the plague of the Frenchwoman's life, is averted. Not less marked is the change in the woman's carriage in walking.

The doctor asserts that he is able to detect infallibly the wheelwoman from her sisters when they cross streets. The one proceeds with self-confidence and ease when the other backs and dodges and loses her head and invites disaster. From this point of departure he proceeds to examine the mental discipline afforded by the bicycle, and thence deduces his most striking conclusions. He finds that the woman's powers of attention and observation are awakened in an extraordinary degree. Perhaps it would be more exact to say that these powers, with which all human beings are endowed at birth, are saved from the atrophy which in both sexes is one of the most marked defects produced by civilization.

The wheelwomen, he insists, become more graceful in every respect. The mincing, wriggling gait is lost among them. They move with more of the freedom and dignity often observed as native to some among the higher races that have not been deteriorated by the vices of pseudo civilization. The doctor is anxious to repel any suspicion that he is weaving theories, and to insist that his deductions are the fruit of actual and scientific, that is, exact observation. He took up the subject with an open mind, and sets down no more than he has seen with his eyes and learned from systematic notes of cases. At the close he permits himself, it is true, to dream of a French new woman, the product of the bicycle. It is not difficult to follow him with faith in his forecast, for his wheel woman does not appear to be in anything different from the figure already made familiar to ourselves on the tennis court. —N. Y. Sun.

## A DRILL PRESS FOR BICYCLE REPAIRING.

For neatly and quickly repairing a broken bicycle, the "Little Giant" foot power drill press shown here-



BICYCLE FRAME REPAIRING ON DRILL PRESS.

with affords the utmost facility. It is light and well made, and especially adapted for drilling small work where neither steam nor electric power are available. In one of the views the drill is represented at work on a bicycle frame, making holes for the rivets to be used in mending a broken portion of the frame. This drill

is made by the Richards Manufacturing Company, manufacturers of novelties and specialties, No. 218 Fulton Street, Brooklyn, New York. It is fitted to a well made and strong iron frame, with wooden table and drawer and large grooved balance wheel. Its weight complete is fifty pounds.

## Strength of Wood.

As a result of nearly 40,000 tests of timber made at the laboratory of the Washington University, of St. Louis, under the direction of the Forestry Division of the Department of Agriculture, says Railway Engineering and Mechanics, the following facts have been determined: Seasoned timber is about twice as strong as green timber, but well seasoned timber loses its strength with the absorption of moisture; timbers of large sections have equal strength per square inch with small ones when they



"LITTLE GIANT" FOOT POWER DRILL PRESS.

are equally free from blemish; knots are as great a source of weakness in a column as in a beam; long-leaved pine is stronger than the average oak, and bleeding timber does not impair its qualities. It is stated that a large amount of chestnut felled in Alabama for the tan bark was allowed to rot because its value for railroad ties was not known. The Division of Forestry called attention to the superiority of this timber for ties, and the wood is now so utilized, with a saving to that region alone of nearly \$50,000 per year.

## Fencing With Newspapers.

Somebody says, "My children fence with rolled-up newspapers as foils, only a touch on the sword arm to count. They begin with some calmness, but in about a quarter of a minute they are whacking away at each other like good fellows, and a quarter of a minute later they are prancing all over the room and laughing uproariously. There seems to be more exercise and more fun in fencing with rolled up newspapers than in any other home amusement."