

## NEW INVENTIONS.

Messrs. Edward W. Chambers and Thomas P. Burnett, of Springfield, Ohio, have patented an improved chair for theaters, churches, halls, etc., which can be folded very easily and compactly. The invention consists in a chair in which the back is pivoted to the rear end of the seat, which is pivoted to two standards and to the arm rests, which are pivoted to the tops of the standards, so that the back will move toward the standards and the arm rests will be inclined downward, thus occupying very little space when the seat is raised.

An improved washing machine, patented by Mr. Alexander Fleming, of Orleans, Iowa, washes clothes by pumping or forcing water through them.

Mr. James Rankin, of Fairlee, Md., has patented an improvement in guano distributors arranged on the frame of a seed drill; and it consists of a guano hopper provided with a series of openings or slots in its bottom, in each of which slots projects a part of the circumference of a revolving wheel provided with a central groove, which receives and carries the guano to the seed spout, a roll provided with arms and staples and passing longitudinally through the hopper being employed to force the guano into the grooved wheels.

An improved trip hammer has been patented by Mr. Solomon Shetter, of New Cumberland, W. Va. This invention relates to a means for regulating the force of the blow given by the hammer, and for entirely stopping the motion of the hammer with ease and celerity without stopping the engine or other motive power by which the hammer is driven, and without the necessity for shifting a belt from a fast to a loose pulley.

An improved stop-cock has been patented by Mr. John Flanagan, of Newburg, N. Y. The invention consists in constructing a stop-cock with an inclined or slightly curved branch pipe, so that a steam tube can be readily inserted through or a force pump connected with the stop-cock for thawing out or removing obstructions from pipes.

Mr. William T. Hall, of Fayetteville, Ind., has patented a charge holder for firearms, a device for use in loading shot-guns and rifles, which can be more conveniently used than an ordinary powder flask and shot pouch, and by which the arm can be rapidly loaded. The invention consists in a shell or tube of a suitable size for holding a single charge and wad, and fitted with a finger slide for pressing out the wad, so that the charge can be poured into the gun.

## Elegant New Western Steamer.

The *Louisville Courier Journal* says of the new Anchor Line steamer: Again the famous Howards, of Jeffersonville, come to the front by building as handsome and fleet a steamboat as ever graced the waters of our rivers. They have built a number of magnificent side-wheel passenger steamboats for the St. Louis and New Orleans Anchor Line, among which we may mention the more recent of which are the Belle of Memphis, City of Helena, City of Greenville, and City of Providence—all of which are noted for their speed, beauty, and elegance. Now they have finished and sent home the new City of Vicksburg, a twin of the steamer City of Providence—an exact copy of the last named steamer. The dimensions of the City of Vicksburg are as follows: Length of hull 280 feet, depth of hold 8½ feet, with 44 feet beam, all oak, well ironed, and fastened extra strong. The guards are 17 feet in width, giving the boat an extreme width of 79 feet and a carrying capacity of 1,600 tons. She has an easy model, with draught light, in running trim, of only 43 inches, making her a great business boat, and a real beauty. The machinery, from the foundry of Ainslie, Cochran & Co., of this city, is a perfect specimen of their handiwork. It is high-pressure, embracing cylinder 26 inches in diameter, with 9 feet stroke; working water wheels 34 feet in diameter, with 15 feet length of buckets. The steam power lies in five main boilers, each 30 feet in length and 44 inches in diameter, with four return flues in each, which give her an abundance of steam, and with her good model and light draught gives an assurance of being very fast. All the appliances required by the steamboat law, as well as those suggested by the advance of the age for safety, are in this boat, including extra boilers for the auxiliary engines—doctor, donkey, and steam pumps. The main saloon is 190 feet in length, 16 feet wide, and 13 feet 6 inches in height, exclusive of the arches. The interior is painted a pure French zinc white in gloss, requiring nine coats, which, together with the gold etchings and reliefs, taxed the utmost skill and patience of the artists in completing its beauties. In contrast or relief the state room doors are of hard wood, polished walnut, decorated or embossed in gold. The texas or upper cabin is 110 feet in length, and admirably furnished for passengers and the officers of the boat.

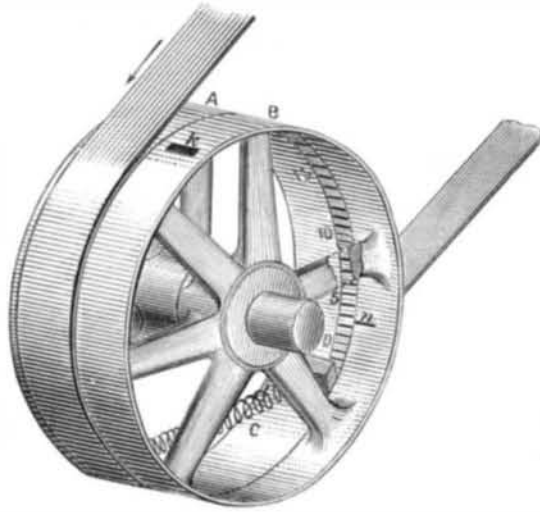
## LATCHINOFF'S OPTICAL DYNAMOMETER.

Among the dynamometers employed for measuring the work absorbed by any machine, the one oftenest used is that of Morin, which traces a curve representative of the work. This instrument gives precise indications, but takes up much space.

I have undertaken to construct a dynamometer sufficiently simple to be adapted to any kind of a machine whatever.

The improvements that have recently been made in machines for the production of light and in electric motors are rendering more and more necessary an apparatus which shall permit of measuring the effective power expended in setting in motion any given dynamo-electric machine. It is only with a like apparatus that can be determined the best conditions of performance; be compared the value of

Fig. 4.



the different apparatus; and be resolved a host of questions which, up to the present time, have been only approximately answered, their solution demanding a measurement of the work, and the Morin dynamometer being too costly, and too difficult to mount to be readily used.

My dynamometer is applicable to all swiftly revolving machines, and especially to dynamo-electric ones. The following is a description of it:

Upon the driving shaft are placed two pulleys, A and B (Fig. 1), connected with each other by the springs, C (Figs. 2, 3, and 4). A is a loose pulley, and B is fixed to the shaft. The belt, D (Fig. 1), moves the pulley, A, which, in revolving, first stretches the springs, C, and then puts the machine in motion. The stress exerted is measured by the tension of the springs. For estimating this tension I have made practical use of the principle of the phenakistoscope, which is based on the persistence of luminous impressions upon the retina.

In the rim of the pulley, B, there is a slit, k (Figs. 1 and 4), and opposite to it, on the inside of the same rim, there is traced a very heavy line, n, in such a way as not to be hidden by the axle. If, while the pulleys are rapidly revolving, we look at the line, n, through the slit, k, it appears to be immovable.

Figs. 1 and 2.

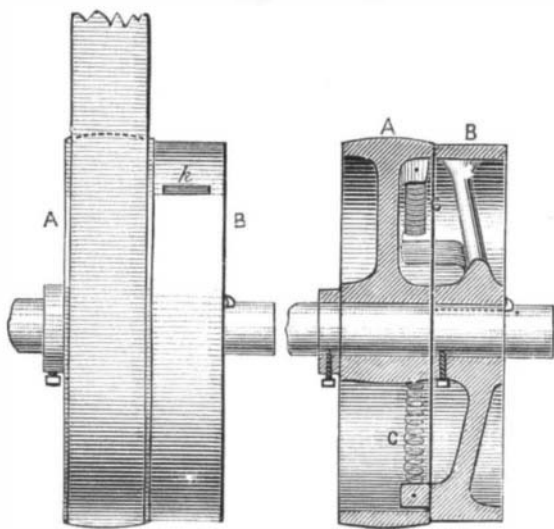
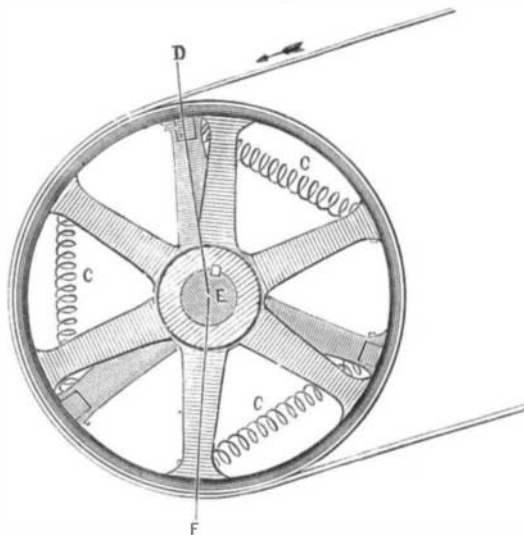


Fig. 3.



## LATCHINOFF'S OPTICAL DYNAMOMETER.

The inside of the rim of the pulley, A, is provided with a scale, which is made in the following way:

The pulley, B, is made immovable, and against the line, n, there is traced on the pulley, A, a zero mark; then, from the loose pulley there are suspended, by means of a cord, weights of five, ten, fifteen, etc., kilogrammes. At the different positions of n, corresponding to these weights, there are traced marks which constitute the scale.

During the working of the machine this scale will appear to be stationary, and one may distinctly see what division of the scale the line, n, is opposite. In this way it is easy to ascertain in kilogrammes the stress exerted on the pulley.

In order to calculate the work absorbed by the machine it is necessary to know the diameter of the pulleys and the number of revolutions of the machine. If a mechanical

counter had to be employed, the process would be inconvenient and not very exact; but fortunately we have excellent trochometers at present which are based on centrifugal force, and which allow of the number of revolutions of the machine being directly read upon a dial, so that a glance through the slit in the pulley and at the dial of the trochometer gives the elements that are necessary to calculate the work. For greater convenience, the scale inside the pulley should be well lighted by a lamp having a reflector.

During the working of the machine the scale will not be absolutely immovable, but will have a backward and forward motion corresponding to that of the steam-engine, because the fly-wheel does not render the working of the machine entirely regular.

I shall not describe in this place the mode of fixing the pulleys, springs, and other parts, since such details are sufficiently indicated by the accompanying figure. I will only remark that the dynamo-electric machine is placed to the left of the pulley, A.

We might also measure the tension of the springs in a purely mechanical way, by causing an index needle to move over a dial by the aid of a screw passing along the shaft. I did at first think of adopting this method, but it seemed to me too complicated, so I abandoned it.

The advantages of my dynamometer are the following: (1.) It is very simple and of small dimensions, and may always remain fixed to the machine.\* (2.) It requires no preliminary installation nor any calculation, a glance being sufficient to determine the work. (3.) It may be easily verified by suspending from the pulley, A, different weights, and seeing whether the divisions of the scale correspond with the latter.

The springs, by stretching through long use, may cause a deviation of the zero of the scale; but the divisions will not perceptibly change, even after the apparatus has worked for a long time.—M. Latchinoff, in *L'Electricité Russe*.

## ENGINEERING INVENTIONS.

An improvement in car coupling has been patented by Mr. John H. B. McCray, of Blossom Prairie, Texas. This invention relates to self-couplers, and it consists of an open-top hook-shaped draw bar provided with a pivoted T-shaped vertically moving coupling bar, and provided also with an end socket for using the ordinary coupling link.

Mr. George E. Whipple, of Fort Edward, N. Y., has patented an improvement in that means for propelling vessels in which the water is drawn in through a longitudinal channel at the bow by a pump or other device and is discharged at the stern.

An improved direct-acting pumping engine has been patented by Mr. Edward G. Shortt, of Carthage, N. Y. The invention relates to certain improvements in that class of direct-acting steam pumps in which a single plunger is constructed at its upper end in the form of a piston to be acted upon by steam, while its lower end acts within a pump cylinder in connection with suitable ports and check valves, and in which the steam cylinder is in one and the same piece with the pump cylinder and in the vertical line of the same, with a valve chest and gear mounted upon the top of the same and operated through a connection with the piston.

Mr. Charles E. Macarthy, of Forsyth, Ga., has patented an improved car coupling, designed to couple the cars easily and securely by a lever under the car, and projecting at the side of the same, whereby all danger involved in going between the cars is avoided.

An improved packing for piston rods, pistons, etc., designed to secure a greater durability, to take up wear as fast as it occurs, and at the same time to form a tight joint, has been patented by Mr. Edward G. Shortt, of Carthage, N. Y.

An improved locomotive engine has been patented by Mr. Ephraim Shay, of Haring, Mich. The invention consists of a locomotive having its bogie wheels formed with bevel gear teeth combined with a horizontal and longitudinally arranged shaft, the shaft being rotated by a direct connection with the engine; also, in novel means

for providing for the horizontal and vertical adjustment of the connecting shaft between the crank shaft and the bogie wheels, and in novel means of conveying the power of the engine to said bogie wheels.

An improved machine for passing logs over dams has been patented by Mr. David B. Weaver, of Hopewell Township, Huntingdon County, Pa. This invention consists principally in providing the top of the dam with a strong beam or shaft having any suitable number of radial arms, the beam or shaft being adapted to be turned in its bearings by any suitable means for throwing logs over the dam.

\* In order that the springs may not be strained too much, the belt should be kept constantly on the pulley, B, and shifted to the pulley, A, only during experiments.