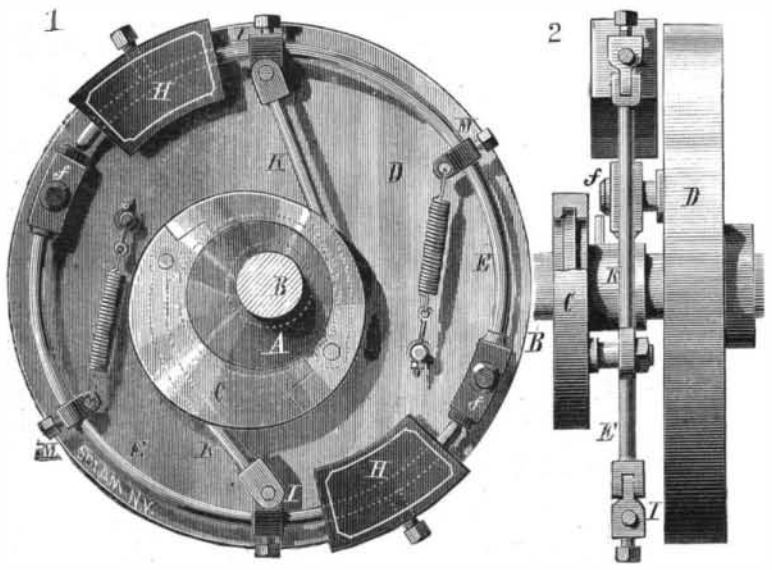
STEAM ENGINE GOVERNOR.

Fig. 1 is a side elevation, and Fig. 2 is an elevation at right angles to Fig. 1, of a governor of the centrifugal type recently patented by Mr. Thomas N. Perrine, of Anna, Ill. Fast to the engine shaft, B, is an eccentric, A, freely turning around which is a second eccentric, C. The usual strap is applied to the outer eccentric, and a rod passed to the valve. On the shaft contiguous to the eccentrics is a circular disk, D. Pivoted by studs, *f*, to one side of the disk are the curved arms, E, each of which is of half the length of the circle, so that when in the inward position the free end of one abuts against the pivoted end of the other. Rubber buffers

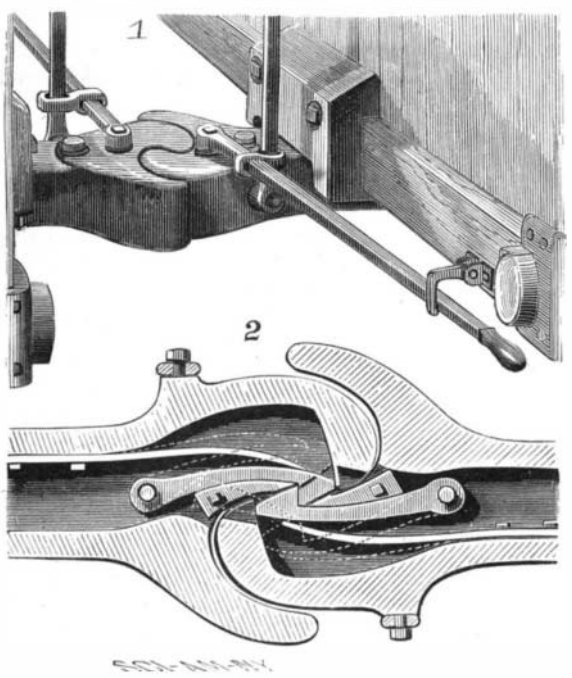


PERRINE'S STEAM ENGINE GOVERNOR.

fitted in the fulcrum ends prevent noise and concussion. Near the outer ends of the levers are adjustable weights, H, and to adjustable gibs, I, are pivoted links, K, connected to the eccentric, C. Springs are secured to studs on the disk and to adjustable gibs, M, on the levers, so that they tend to draw the levers inward. It will be seen that since all these parts are adjustable on the levers in relation to each other and the fulcrums, the movement of the levers by centrifugal force can be finely regulated. During the rotation of the disk the levers tend to move outward, causing the outer eccentric to turn more or less on the inner one. The effect is to shift the crowns of the eccentrics so that they approximate more nearly a concentric disk, thereby reducing the throw and lead of the valve. The parts can be set to insure this movement when the desired rate of speed is exceeded, so as to check the engine, and also a reverse movement by action of the springs when the speed is too low.

IMPROVED CAR COUPLING.

The drawhead is cast in one piece formed with a longitudinal chamber to receive the coupling hook; through its rear portion passes the drawbar, which passes through plates sliding in the car frame and having interposed between them the buffer spring. The form of the cast metal coupling hook, which is pivoted



MULLER'S IMPROVED CAR COUPLING.

within the chamber of the drawhead by a vertical pin, is shown clearly in the plan view, Fig. 2. A spring secured to one side of the chamber presses the head of the hook against the inner face of a cam plate, which is rigidly connected to a vertical pin projecting upward to receive the end of the uncoupling rod (Fig. 1), which extends to one side of the car and through a horizontal opening in a link block, through a vertical opening in which passes a lever pivoted to the side of the drawhead; the upper end of this lever is connected with the end of a second one fulcrumed to the end of the car and extending upward, so as to be operated from the roof. It will be seen that the cam plate may be turned against the coupling hook to force its head back by operating either of the levers. The front ends of the drawheads are recessed, as shown in both figures. The cam plates form stops to the opposing coupling hooks, so as to hold the heads normally beyond the inner face of the drawheads at the recess, so that as the cars come together for coupling the inclined faces of the hook heads will strike each other; when the shoulders pass each other, the springs cause the hooks to interlock automatically. The recessed form of the drawheads prevents lateral separation and relieves the hooks from all strains tending to unlock them. To uncouple the cars, either of the levers may be worked to turn the cam. The levers of opposing drawheads extend sidewise in opposite directions, so that uncoupling can be effected from either side of the train. By means of suitable hooks attached to the car, the coupling hook heads may be held within the recess by holding back either of the levers.

This invention has been patented by Mr. William Muller, and particulars can be obtained by addressing Mr. Philip Breitenbucher, of 32 Marietta St., Atlanta, Ga.

IMPROVED BARBED WIRE FENCE.

The barbs, A, B, C, are of sheet metal, and may be made of scrap tin or other waste pieces of metal, cut and bent so as to assume an open diamond form presenting sharp edges and angles, and having two holes midway of the length of the barb. The holes may be easily made by doubling the metal, and punching both at the same time. The bent form of the barb adds very materially to its strength, and it may, accordingly, be made of light metal. The barbs are strung on the wires by threading them through their holes, and after arranging them at suitable distances apart, twisting the wires to form a coarse strand. This throws the faces of the barbs on the sides of the wires, so that they can be seen plainly, and while perfectly secure they are free to turn slightly. The barbs will not penetrate like knife blades, which they would do if flat, and being widest in the middle stock cannot get fast on them. A barbed fence of this description may be cheaply made, and without the aid of expert labor.

This invention has been patented by Mr. George De Walt, of Kenton, Ohio.

Economy in Drop Forging.

Waste of scale in the oxidation of forge heated iron and steel makes a large proportion of the cost of the ordinary hand forging; but if, instead of repeated heatings with an indefinite number of blows of the hammer, there could be lesser number of heatings and only one or two blows to a heat, the cost by waste would be appreciably diminished.

Now look at a few facts: The waste of material in drop forging is the minimum waste. One heating, in many instances, is equal to ten—eleven—heatings for ordinary anvil practice. There are instances where the proportion in favor of the drop forging is much greater. The rapidity of the work by drop forging is greatly in its favor. The perfection of the resultant job is unquestionable.

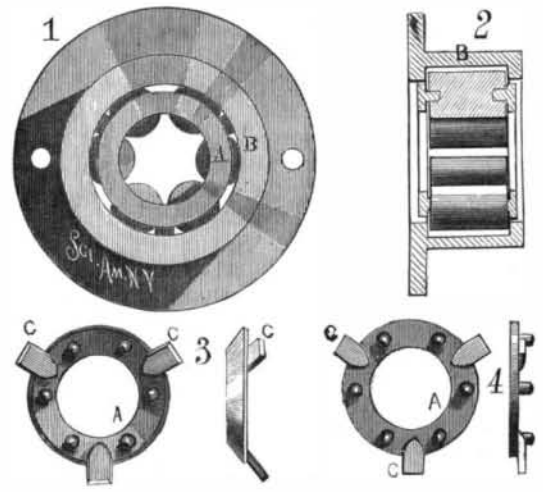
In a single instance a lump of round steel weighing $7\frac{13}{16}$ ounces passed through drop hammer workings six in number, and turned out its resultant product at a loss of only $\frac{7}{16}$ of an ounce.

IMPROVED TIRE TIGHTENER.

A tire tightener recently patented by Mr. Tyree Rodes, of Wales, Tenn., is shown in the annexed engraving. The ends of the tire are bent inward at right angles to fit against the ends of the fellies, and are formed with apertures for the passage of a screw bolt, which is formed with a flat head, E, held between one end of the tire and the corresponding end of the felly. The washer, F, is between the other end of the tire and the nut, G. The free end of the bolt is screwed into a long nut, J, which rests against a plate, K, formed with a stud that enters a notch in the end of the felly. A series of U-shaped washers is mounted on the bolt between the ends of the tire, their outer edges being straight and flush with the outer surface of the tire. A wedge-shaped piece of leather is placed between the tire and the nuts, G J, to lock them in place. When the tire is to be tightened, one or more of the washers are removed, and the nut, G, drawn up tight to bring the ends of the tire together. Then the nut, J, is turned to force the ends of the fellies from each other, thereby pressing them firmly against the tire; at the same time the dish of the wheel can be adjusted.

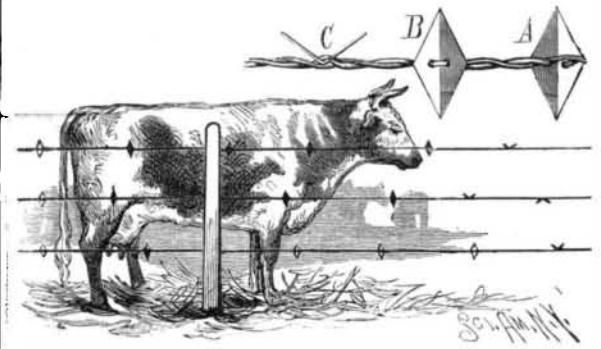
FRICTION ROLLER BEARING.

As generally constructed, friction roller bearings involve more or less machine work in connection with



DABOLL'S FRICTION ROLLER BEARING.

screws, tapped holes, riveting, etc., which so adds to the cost as to practically exclude them from certain cheap grades of blocks; the object of the improvements herewith illustrated is to so simplify their construction as to materially reduce their cost without impairing their efficiency. These bearings are for use in blocks, sheaves, etc. Figs. 1 and 2 are end and side views, respectively, of the bearing; Fig. 3 shows two views of a pivot ring before being applied to the bearing, and Fig. 4 shows its form in the bearing. The solid shell is provided with the usual flange and internal annular recess for the reception of the rollers, each of which is axially bored at each end to receive the pivots it revolves upon. The pivot rings are located at each end of the recess, and pivots are formed on the inner face of each. The rings are also formed with three or more lugs, *c*, projecting radially from the periphery. When in their normal condition, the rings are frustums of hollow cones with lugs projecting downwardly and outwardly from the

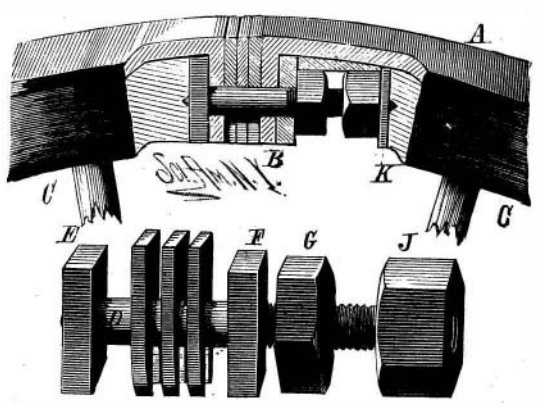


DE WALT'S IMPROVED BARBED WIRE FENCE.

lower edges. A ring is placed in the recess and then flattened out, thereby increasing its diameter and causing its lugs to properly occupy the recess. The rollers are then introduced, when the second ring is placed at the other end of the recess and forced inwardly into a flattened condition, causing its lugs to enter the recess. The rollers are thus confined in their proper working position. New rollers and rings may be substituted when the old ones become worn. This method of construction produces at low cost a durable and effective friction roller bearing. At the end of a very severe test of a sheave made in this manner, the rollers and pin were found very perceptibly worn, but the rings were uninjured.

Additional information regarding this invention may be had by addressing the patentee, Mr. Austin P. Daboll, P. O. Box 1037, New London, Conn.

LETTER-RATS, when several stamps are placed closely together upon letters containing money, after taking off the stamps, cut a slit into the envelope, through which they abstract the bills, and cover the cut up, again putting on the stamps. The French postal department,



RODES' IMPROVED TIRE TIGHTENER.

bringing this practice to the notice of the public, recommends, therefore, that when more stamps than one are used, they be placed about one-eighth inch apart.

Bleaching Ostrich Feathers.

1. Wash the feathers with Castile soap and rinse *them thoroughly with lukewarm water* in order to remove all the grease and soap which may stick to the flue.

2. Soak feathers in a bath composed of one gallon of ammonia, 20° Be., to every eight gallons of plain water, for about 8 to 10 hours.

3. Take feathers out of this bath, and squeeze out the excess of ammonia which is in the flue by passing feathers through a wringer.

4. Put feathers in a bath composed of 5 gallons peroxide of hydrogen, with addition of 12 to 16 ounces of ammonia, let it work slowly, stirring feathers from time to time for about 6 hours; after 6 hours' working, put feathers in one side of the bath and add 5 gallons peroxide of hydrogen and 3 to 4 ounces of ammonia. Stir the bath well so as to insure the mixture of the peroxide with the ammonia. Then let the bath work for 9 to 12 hours more, after that time add again 2 or 3 ounces of ammonia. The peroxide will work yet for 12 hours more until it gets exhausted, and you may ascertain the fact by the following process:

Take a small quantity of the bath in a tumbler and throw in a few crystals of permanganate of potash; should bubbles of gas appear, it is proof that the peroxide is working; yet if none appear, the peroxide is exhausted.

Then the feathers have to be rinsed 3 or 4 times in lukewarm water, and then to be put in a second bath of peroxide of hydrogen, which has to be prepared as follows:

To 2½ gallons peroxide of hydrogen add 2½ or 3 gallons plain water and 8 ounces of ammonia, and put in the feathers. Let the bath work so for 10 hours, and after add again 2 ounces of ammonia as before, and it will then work 12 hours more until it is exhausted.

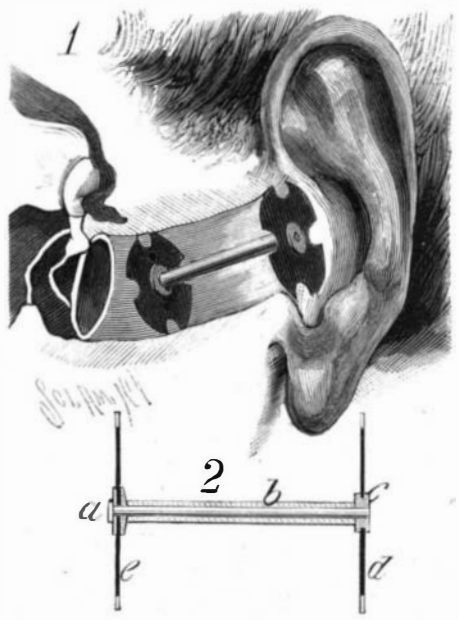
It is claimed that every one who will follow carefully the above directions will succeed to make white the darkest gray feathers, say 10 pounds of feathers by using about 7 to 7½ gallons of peroxide.

After the feathers have been taken out of the peroxide bath they must be rinsed thoroughly with lukewarm water 2 or 3 times, and after soaking them again in a soap solution for 6 to 8 hours, rinse them in lukewarm water, in order to remove all soap and dirt remaining in the flue.

ARTIFICIAL EAR DRUM.

The object of the invention herewith illustrated is to provide an artificial ear drum to be used by deaf persons. It is constructed of a magnetized steel rod, provided with a gold or silver covering, carrying a soft rubber disk on each end; the disks are held in place by gold washers, and are formed with ventilating apertures and notches. The magnetized steel rod, *b*, is surrounded by a closely fitting gold or silver tube, and at one end is the head or button, *a*, against which rests a rubber washer. Between this washer and a gold one the disk, *e*, is held. On the opposite end of the rod a thin soft rubber disk, *d*, is held by two gold washers, *c*. That end of the device carrying the soft rubber disk, *e*, is inserted in the auditory channel (Fig. 1) of the ear until the head, *a*, adjoins the delicate organs of the ear. The magnetized rod receives the impulses of the air wave, and carries them along and discharges them to the nerve of the ear with slight magnetic force, causing the organs to assume increased action. The disks hold the device in position, and protect the organs from coming in contact with the gold parts. The front washers, *c*, or disk receive the sound waves, and convey them to the rod. The outer disk is held on the outside part of the ear, just out of sight but within reach of the fingers, to permit inserting and withdrawing the instrument.

This invention has been patented by Mr. John H. Nicholson, of 93 Clinton Place, New York City.



NICHOLSON'S ARTIFICIAL EAR DRUM.

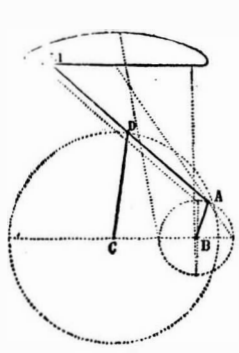


FIG. 1.

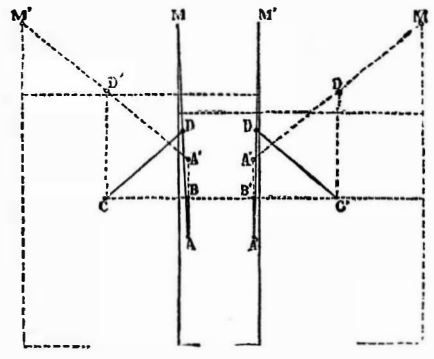


FIG. 2.

TCHEBICHEF'S WALKING MACHINE.

The idea of a walking machine is not entirely new, since as many as forty patents have been taken out in France for such a device, which is one that may be put to profitable use. In the season of snow and hoar frost, locomotives run with difficulty on the rails, and the idea has occurred that it would be well to add to them a temporary mechanism after the manner of feet as a substitute for wheels. Thus, we find in the galleries of the Conservatoire des Arts et Metiers three samples of locomotives with feet, devised by Mr. F. Hermann. One of these, with a single motive cylinder, is a small model that may be made to move forward by pressing a rubber bulb; another is provided with four cylinders, and the third is arranged for curves of short radius. It will be understood that this kind of a locomotive may be very usefully employed under other circumstances.

The principal mechanism of Hermann's walking machines consists either of eccentrics or of jointed parallelograms. The object of this article, however, is to make known a mechanism that has just been devised by Mr. Tchebichef. We ought to say that it is a question here principally of a theoretical solution. It is for professionals to study the results of the experiments from the data given by the illustrious professor of the University of St. Petersburg. What we usually call a jointed parallelogram in mechanics is a quadrilateral, or figure formed of four sides of invariable length, one of which remains fixed. The extremities of this latter (which is the base) are the centers of revolution of the two adjacent sides, and the side opposite the base is balanced in a more or less complicated manner, according to the respective sizes of the quadrilateral's sides. Watt's parallelogram is a well known example of such a mechanism. It is often applied in steam engines for directing the rod of a piston which must effect as rectilinear a motion as possible. Mr. Tchebichef long ago demonstrated that with the jointed parallelogram it was impossible to obtain a motion that was absolutely mathematically rectilinear. It is to Mr. Peaucellier that we owe the first accurate solution of the problem of constructing a straight line; but this, although published in 1864, has remained unnoticed.

In 1870, a student in the University of St. Petersburg, a Mr. Lipkine, presented to Mr. Tchebichef a jointed apparatus that permitted of tracing a straight line mathematically. But this in nowise affected the conclusions of Tchebichef, since the jointed apparatus was not a parallelogram, but contained seven rods or sides instead of three. The student received the encouragement of his professor, his university, and his government for this admirable discovery, which was but the Peaucellier apparatus revived. As for General Peaucellier, he was rewarded later on, the French Academy having given him a fine prize.

In order to draw a straight line, a ruler is made use of; but this in the first place must be verified. While we are purchasing it of the dealer, we place our eye at

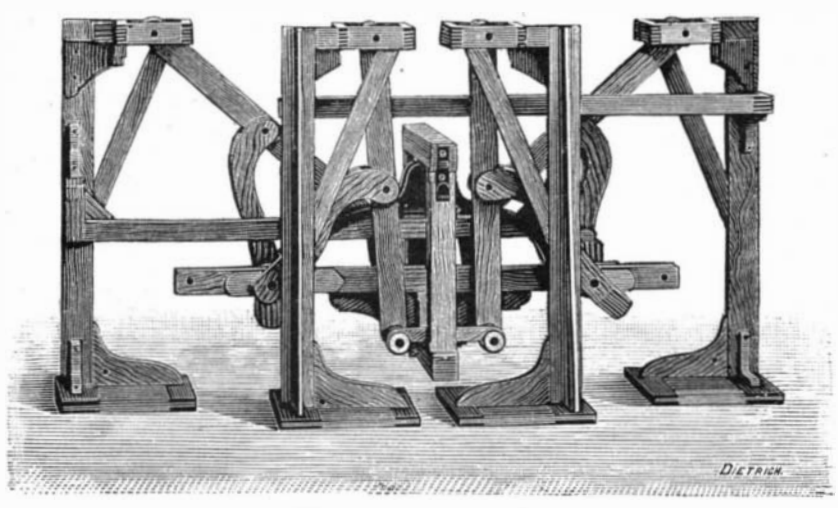


Fig. 3.—POSITION OF REST.

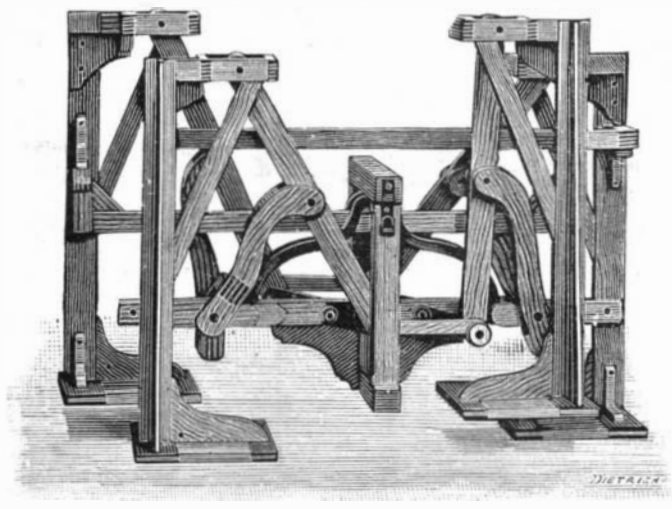


Fig. 4.—THE RIGHT FORE FOOT AND THE LEFT HIND FOOT RISING IN ORDER TO ADVANCE TO THE RIGHT.

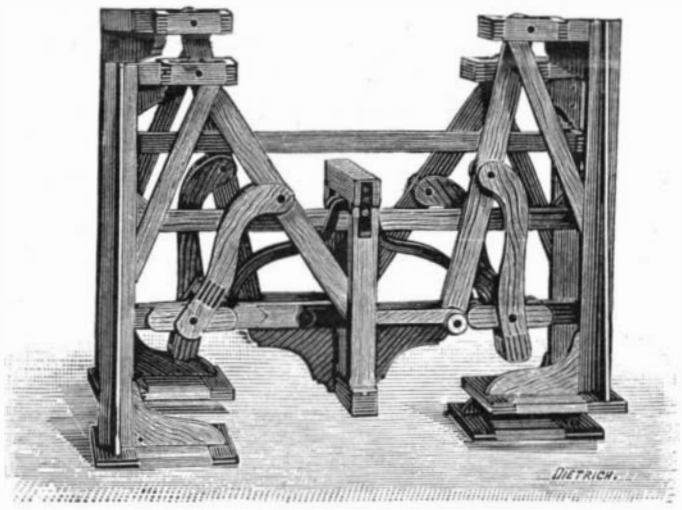


Fig. 5.—A FURTHER ADVANCE.

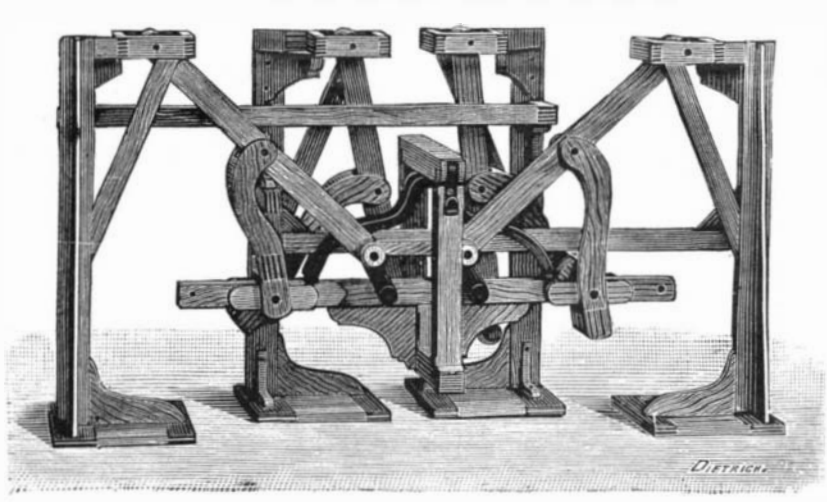


Fig. 6.—SECOND POSITION OF REST.