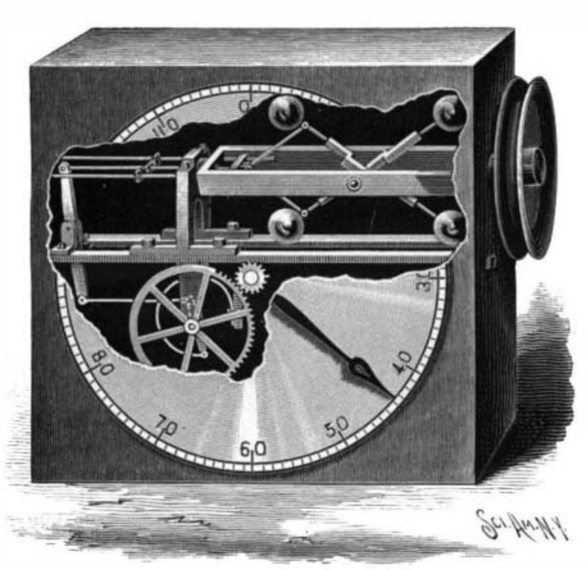
AN IMPROVED SPEED INDICATOR.

The illustration represents a speed indicator especially adapted to show the speed in miles of a railway train, or the speed by number of revolutions or feet for any piece of machinery. The invention has been patented by Henry Herden, chief engineer of the Buffalo and Susquehanna Railroad, Wellsboro, Tioga County, Pa., and is for an improvement on a formerly patented invention of the same inventor, designed to improve the construction and render the indicator more accurate. Upon a skeleton horizontal partition within a suitable casing are bearings supporting a shaft having a central rectangular opening in which two levers are pivoted at



HERDEN'S SPEED INDICATOR.

their centers. The levers are perfectly balanced upon the pivot pin, each arm carrying a weight at its outer end, and the inner ends of the levers are pivotally connected by links with a sliding crossbar, from which a rod extends centrally through the shaft and bearing to a swivel connection with a crosshead, which may be shaped to form an oil receptacle. The crosshead slides on horizontal guide bars and is pivotally connected by a link with a balance lever from whose lower end a connecting rod extends to an upper arm upon a spindle carrying a segmental gear, an opposite arm upon the spindle being attached to one end of a spring whose opposite end is secured to a hanger, the spring being designed to equalize the centrifugal force of the levers. A wheel having only a portion of its periphery toothed is employed instead of a segment, as affording a more perfect balance, and the gear is in mesh with a pinion whose spindle carries a pointer moving on a dial on the outer side of the case. To limit the movement of the levers when the index hand is at zero on the dial, a set screw is placed on the moving shaft in position to engage the outermost weight of one of the levers, the shaft being connected by belt and pulley with the machinery whose speed is to be indicated. This indicator is designed to be placed at any angle to the level plane, and not be at all affected by the jolting of a moving train or other forces, the indicator hand moving or remaining stationary as the speed of the machinery changes or remains even.

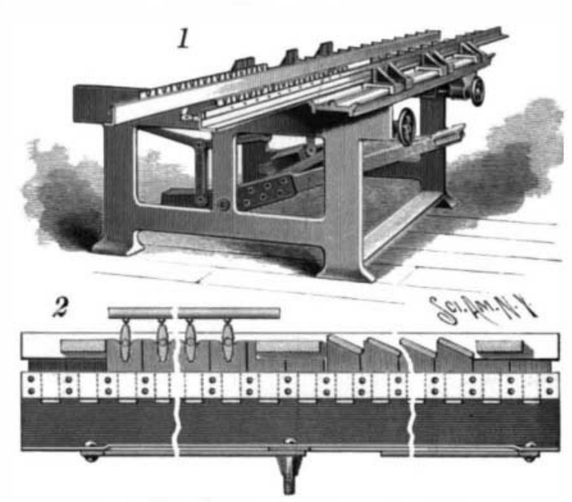
A NEW BLIND SLATTING MACHINE.

A thoroughly tested machine, in which it is stated one man has slatted, clamped and doweled from two and a half to three and a half as many blinds in a day as would be done by hand according to the present system, is shown in the accompanying illustration. The tests were made by men unused to working the machine, and it is claimed that two men, after becoming proficient in its use, will be able to clamp, slat, and dowel not less than six hundred blinds per day, ready for the rabbeting machine. The new machine has been patented by George I. Parks and William D. Nelson, of No. 427 Walker Street, Augusta, Ga., Fig. 1 showing the machine in perspective and Fig. 2 being an enlarged sectional view. Arranged at each side of the frame of the machine are frame-clamping dogs mounted on bars which may be moved toward and from each other by operating a foot lever, and between the dogs are two slat-supporting plates pivotally connected by links and a central bar, the plates being adjustable toward and from each other according to the length of the slats to be connected with the blind frame. Detachably connected to the upper portion of each slat-supporting plate are slat-holding teeth, those at one end supporting rolling slats and those at the other end stationary slats, as shown in our view, although the machine may be arranged to slat all rolling slats or all stationary slats. In operation the side rails of a blind are placed in the blind clamp and the dogs and clamp closed to bring the rails toward the slat-supporting plates, as many slats as desired being placed in the holding teeth. The side rails being blocked up so that the holes will come opposite the tenons of the blind slats, the frame-clamping dogs are moved toward each other, when the side rails engage with the slats, after which the entire blind may be wedged and doweled, or pinned at once. The machine is designed to do the work with greater accuracy, as well as with much greater rapidity, than it can be done by hand, and is adjustable to any size of blinds.

TEST OF A THREE HUNDRED HORSE POWER STEAM TURBINE.

In the common form of steam engine there is a serious loss arising from the fact that the cylinder is connected alternately with the steam supply and with the exhaust. The lowering of the temperature of the cylinder during the latter condition causes the condensation of a certain amount of the next supply of steam that is taken in, and this represents an actual loss of energy. The amount of loss will vary according to the range of temperature to which the cylinder is subjected. This difficulty is inseparable from all engines which utilize the expansive power of the steam in a closed cylinder. In the endeavor to reduce the variations of temperature, the steam has been expanded in two or more cylinders, and the quadruple expansion engine of to-day is giving economical results which fully justify the multiplication of parts and increased first cost of its construction.

The closed cylinder engine is finding a formidable rival in these later days in the steam turbine, or rotary impact engine. In these machines the energy of the steam is utilized by discharging it at an enormous velocity against the buckets of a wheel. The steam acts merely by its velocity and not, as in the expansion engine, by pressure. In order to secure the greatest possible velocity, the steam is expanded during the last few inches of its travel through the nozzle, the expansion being secured by making this part of the nozzle divergent. The theoretical speed of the steam as it finally strikes the buckets is enormous, and in the case of a jet with an initial pressure of 75 pounds, discharging into a condenser in which the pressure is 1½



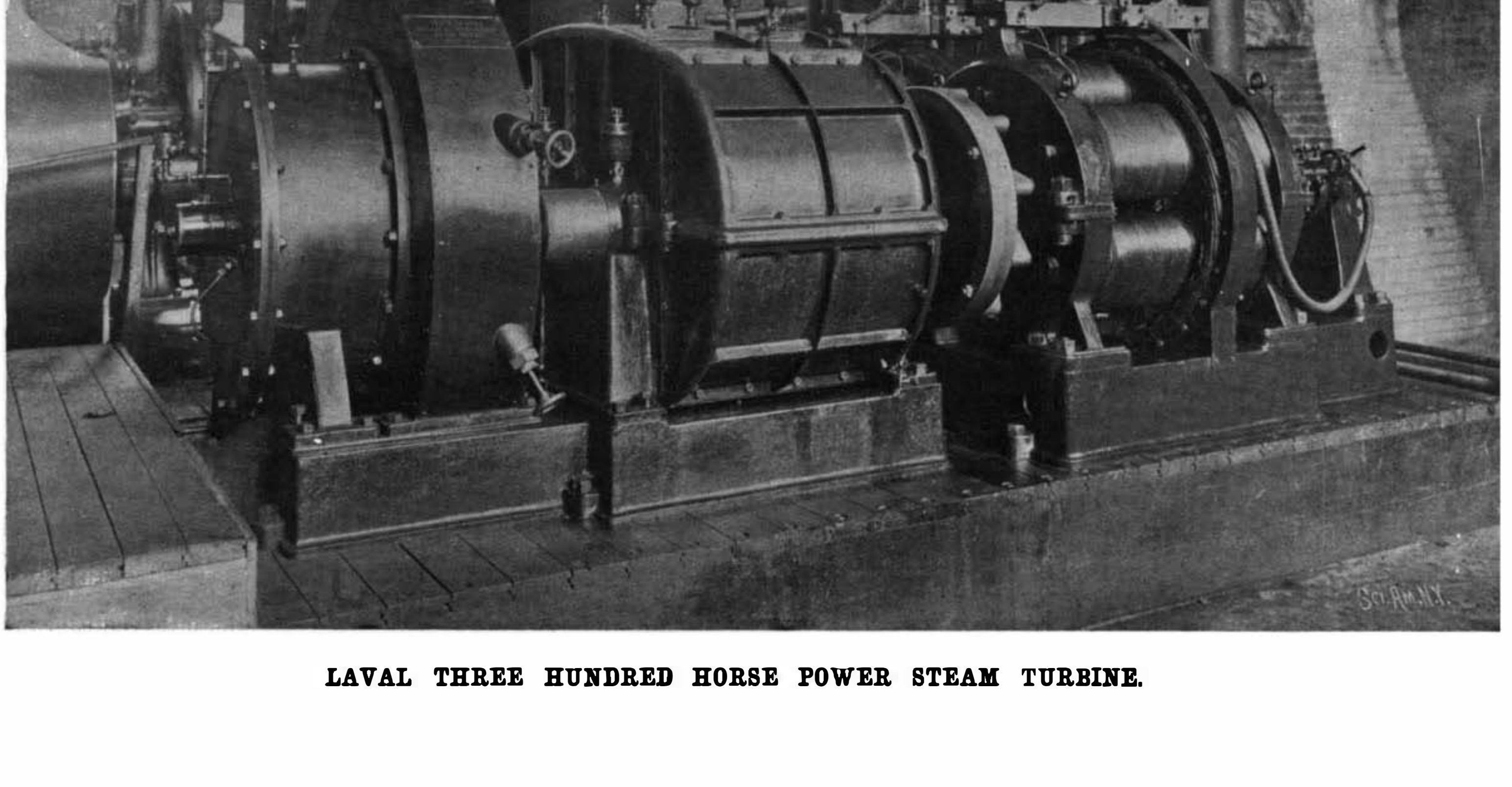
PARKS AND NELSON'S BLIND SLATTING MACHINE.

pounds, the speed would reach the theoretical speed of 4,600 feet per second.

There were great possibilities in store if engineers could only construct a rotary engine which would stand the enormous speed of rotation that was necessary in a steam turbine.

De Laval, in France, and Parsons, in England, each working on his own lines, have produced turbines which have shown their ability in actual test to give an electrical horse power on less than 20 pounds of steam per hour. De Laval did not hesitate to develop the total energy of the steam at a given pressure upon a single wheel, and he has built turbines that ran at the rate of 30,000 revolutions per minute. Parsons made use of several wheels and reduced the pressure of the steam in several stages. The steam was led through one set of turbines into a receiver. From this receiver it passed through a second set into another receiver, and so on until the steam finally reached the condenser.

The accompanying illustration shows a three hundred horse power De Laval steam turbine which is running very successfully at the Twelfth Street station of the Edison Electric Illuminating Company, New York City. The steam is led into a circular steam tight casing in which is located the turbine wheel. This wheel has a diameter of 29½ inches, and runs at 9,000 revolutions



LAVAL THREE HUNDRED HORSE POWER STEAM TURBINE.