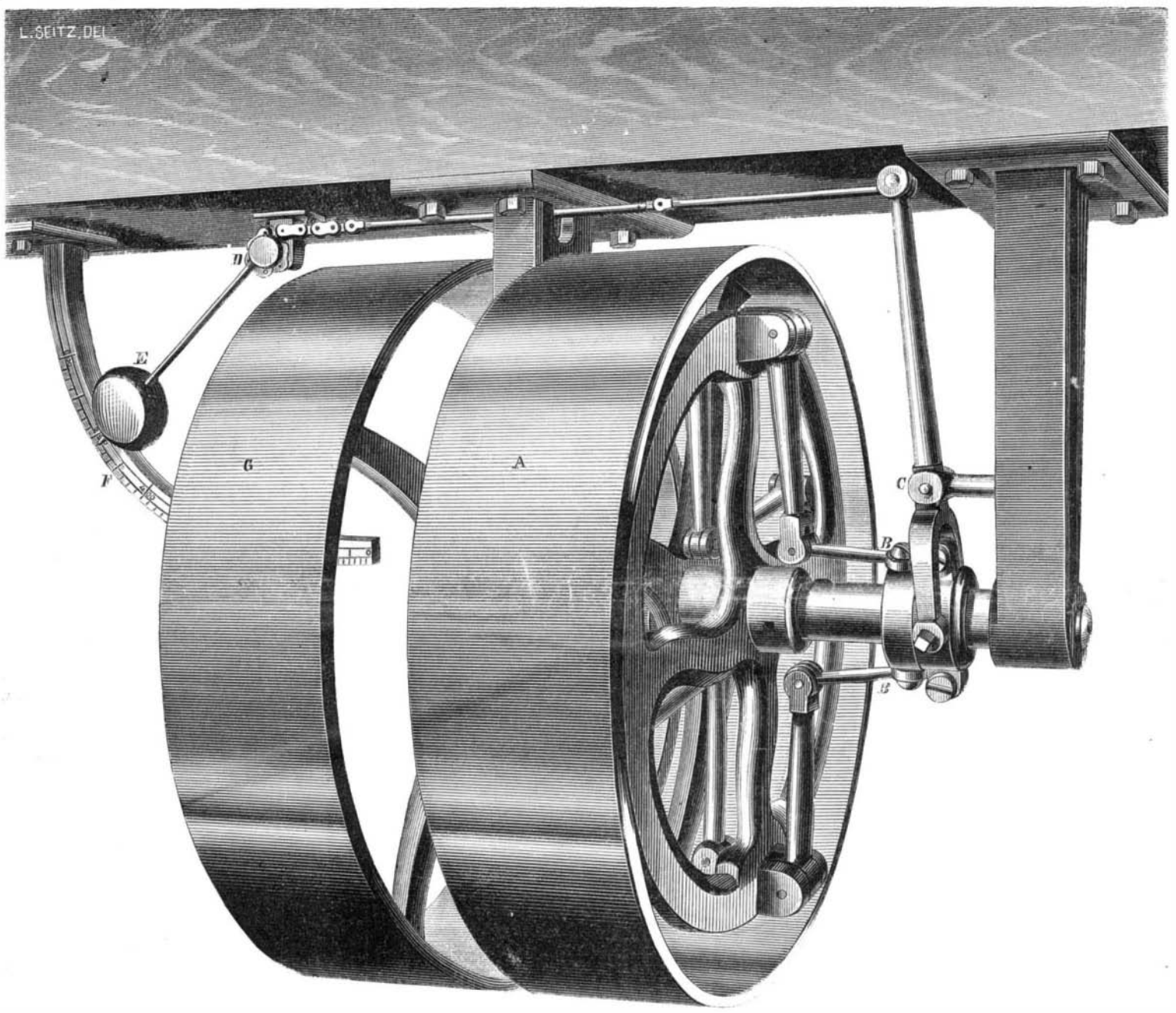
SCIENTIFIC AMERICAN

A WEEKLY JOURNAL OF PRACTICAL INFORMATION, ART, SCIENCE, MECHANICS, CHEMISTRY, AND MANUFACTURES

Vol. XX.—No. 1. [NEW SERIES.] NEW YORK, JANUARY 1, 1869. $3 per Annum [IN ADVANCE.]

Improved Device for Measuring Power in Transmission.

The advantages of a reliable dynamometer have several times been commented upon in our columns—something that would show the amount of power transmitted at all times and under all circumstances. When the object is merely to ascertain the amount absorbed or required by a single machine, a series of machines, or a line of shafting, or the necessary means of transmitting power, a temporary attachment of the power measurer will be sufficient; but there are cases where a permanent attachment of the device is desirable. Such are all cases where the users of mechanical power are hirers, and pay so much per horse power used. The method of guessing or averaging, based on width of belt, size of pulleys, and weight of shafting is hardly accurate enough where the cost of production of power is felt, as where the power is supplied from a steam engine, or a water source liable to diminish in amount, or fail entirely. The dynamometer should also be so simple in construction, and so exact in operation, as to be readily understood, and afford no possible or justifiable cause for controversy between hirer and letter of power. Such is the design of the device herewith illustrated. We have seen several of them in use, and from inquiry have ascertained that their performance was satisfactory to both parties. This fact speaks loudly in favor of the machine.



EMERSON'S LEVER DYNAMOMETER.

It is very simple in construction, and direct in operation. The pulley, A, is loose on the shaft, and receives the power. Its connection with the shaft is made by means of a wheel, keyed or screwed firmly to the shaft in close contiguity with the receiving pulley, its hub, in fact, forming one of the guides to the position of the pulley on the shaft. To connect this fixed wheel with the loose receiving pulley, a bell crank lever is pivoted into projecting ears on the rim of the fixed wheel on opposite sides, the long arm of which connects with an annular slotted collar on the shaft by means of the short bars, B. The short arms of the bell crank levers connect on the inside of the fixed wheel with two radial bars, one parallel to the outer arm of the bell crank, and the other at right angles to it, receiving near its upper end a pivot passing through a swivel hung to the rim of the fixed wheel, and having its extreme end pivoted to a stud fixed on the inner side of the rim of the receiving pulley. It will be seen from this description that the strain of the power received through the belt on A, will necessarily react on the levers, and, through them, on the fixed wheel, which may be considered nothing more nor less than a support to these levers in sustaining them in position to connect the loose receiving pulley with the shaft.

At B it will be seen the levers are connected by pivots with the sliding collar, in the annular groove of which is seated a strap with which is connected a forked lever, the fulcrum at C. To the end of the long arm of this lever a rod with a short section of machine chain is attached. This chain runs over the cylindrical head, D, of a pendulum weight, E, having a pointer that traverses a fixed quadrant, F, properly divided by a scale to denote the relative pressure exerted through the medium of the receiving pulley on the shaft. The pulley, G, is fixed to the shaft, and delivers the power.

With this description of the parts, and an examination of the engraving, any of our readers may understand the operation of the device. It will be seen that all the motions are absolute, there being no chance for play and "backlash," except that of joints and pivots; and this, by good workmanship, can be reduced to the minimum—too little to be taken into consideration practically. There is no dependence upon springs, spiral, or other forms, which are so liable to be affected by changes of temperature, and so unreliable between extremes of demand. It is a weighing machine as correct in principle as the old fashioned steel yards or the platform scales; in fact, it is simply a rotary platform scale, and each machine is weighed and tested in place by hanging to the pulley, A, sealed weights, and marking the index as each weight is added. The length of the connecting bars and chain are adjustable. The machine is made of sizes, and in different styles suitable for testing all kinds of machinery. One kind especially adapted for spinning frames, looms, etc.; another to be connected by belt to a line of shafting, or any kind of machine. And one especially adapted for testing turbine water wheels, to which it is easily applied, with but comparative small expense.

Patented by James Emerson, July 7, 1868; whom address for further particulars at Lowell, Mass., Postoffice box, 582.

Supply of Iced Water to Paris.

Every one who has visited the cafés of Paris must have observed the *carrafes crappees*, that is to say, water-bottles with a great block of ice, often very curiously crystallized inside. The production of these frozen decanters has become a very important operation, which is carried on in the ice-houses situated in the Boulevard Lannes, on the Passy side of the Bois de Boulogne. The establishment, according to the *Journal of the Society of Arts*, consists of ten great underground ice-vaults, protected from the action of the sun by buildings raised over them, and covered with straw. Each of the ice vaults is nearly 500 feet long, and about 36 feet high, and the ten are capable of holding 10,000 tuns of ice. The department in which the water bottles are frozen is a curiosity. These decanters are two-thirds filled with filtered water in the receptacles of the freezing machine, and the freezing is produced by means of salt water and vaporized ether, with the help of a steam engine of sixteen-horse power. When the water within the decanters is reduced below freezing point, it is rapidly stirred with a stick, when the freezing takes place as if by magic. More than 6,000 of these frozen *carrafes* are sent out daily in hot weather, at a very trifling charge, and each being filled up with fresh water as often as required, will serve during a long summer day, and cool ten gallons of water.—*American Gas Light Journal.*

STEEL hammered when "black hot" may be condensed in its substance to a spring temper, but for subsequent tempering it should not be hammered after the glow has departed.