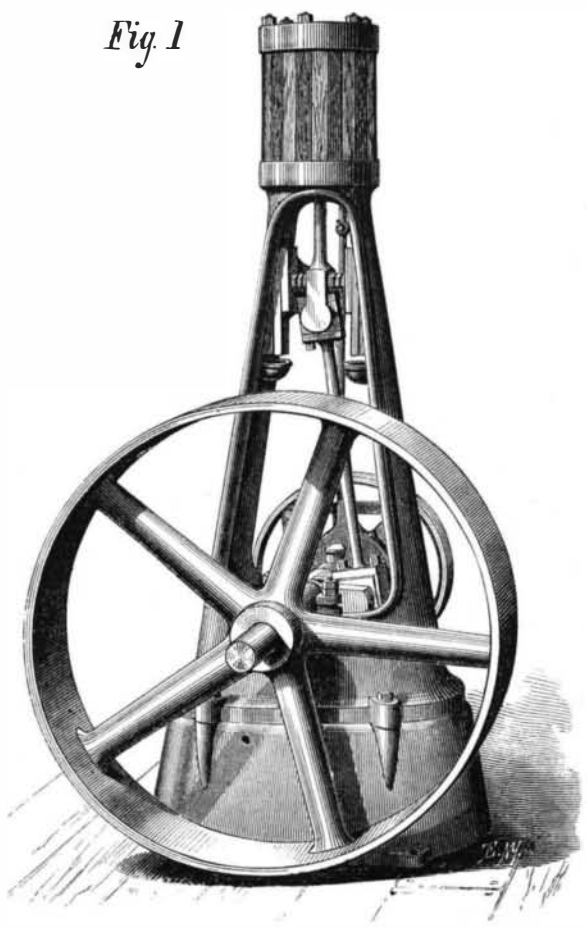
IMPROVED STEAM ENGINE GOVERNOR.

We illustrate herewith a new and simple device which acts both as a governor and as an automatic cut-off. It is quite sensitive, may be adjusted so as to allow of the engine being

Fig. 1



run at any desired speed, and is so constructed that in case of its rupture the engine is caused to stop.

A, Fig. 2, is the eccentric which connects with the valve rod in the usual way. Its hub is guided by gibs, B, which rest on the slides shown; and at the same time are provided with lateral grooves into which the edges of the slides enter, as shown in the sectional view, Fig. 3. The slides are adjustable so that wear may be taken up. To the eccentric are attached the system of levers, C, which are pivoted to the arms of the disk in which the device is disposed, and to which are attached the weights, D. Also attached to the eccentric is the coiled spring E, the outer end of which is fastened by a screw and nut, by means of which the tension of the spring may be increased or diminished at will.

The shaft passes through the slot shown in the eccentric, which slot is of such length as to permit sufficient lateral motion of the eccentric to prevent the valve from opening at the minimum throw. It will be obvious that, when the speed of the engine increases, the weights, D, are thrown out by centrifugal force, and the eccentric is moved across the shaft. The travel of the valve is thus reduced until the engine is brought back to its former speed. If there is a tendency to decrease the speed, the spring, E, draws the eccentric in the opposite direction so as to impart a longer stroke to the valve. The joint action of the tension spring, E, and weighted levers, C, on the sliding eccentric thus serves to keep up the uniform motion of the engine according to the degree of speed to which the engine is adjusted, while in case of breakage of the spring it will be clear that the action of the weights will be such as to reduce the valve throw to minimum and so stop the machine.

The device has been applied with much success to small engines of the type shown in Fig. 1, which are especially constructed for small steam yachts. We are informed its addition does not increase the cost of the engine over that of one fitted with the usual ball governor.

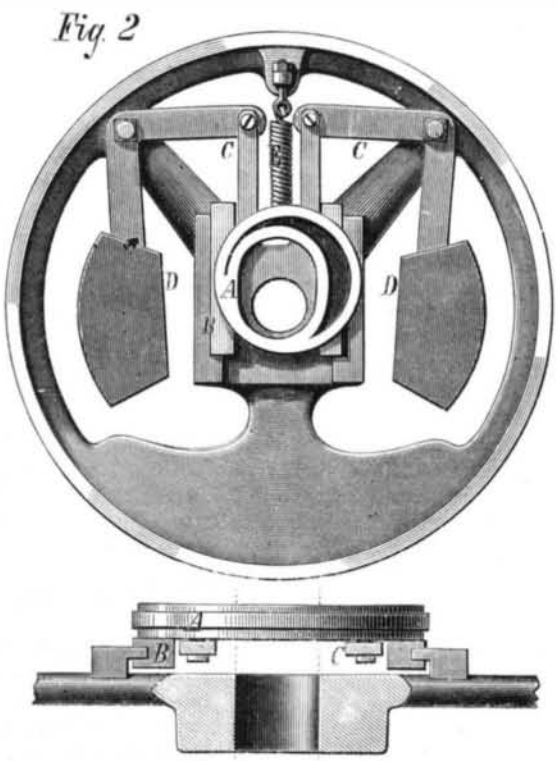
Patented through the Scientific American Patent Agency, by Mr. H. Tabor, May 22, 1877. For further information address the makers, Messrs. B. W. Payne & Sons, Corning, N. Y.

Docks of Liverpool.

The docks on the Mersey are, perhaps, the most magnificent series in the world. They extend over a water area of 255½ acres, and possess 18¼ miles of quays. Facing the river they present an unbroken line of more than 6 miles. On the Birkenhead side, the water area, including the Great Float, is 165 acres, the quays are more than 9 miles in length, making in the whole 421 acres of water area and 28 miles of quay space, a set of statistics which will probably afford a clearer idea of what has been done than the most elaborate attempt at word painting.

The Corn Dock is of comparatively recent construction, and boasts a splendid range of warehouses and elevators. Into this dock the largest ships engaged in the grain trade can be brought with perfect ease, and here they can lie against a range of magnificent warehouses ten stories in height, and with a cellar story below the level of the water. The corn is discharged from the vessels which bring it in bulk by very simple yet effective machinery worked by hydraulic power. From the ships it passes into the cellar floor, which is perfectly rat-proof and water-tight, and thence is raised in a species of hopper worked by the same power to the topmost floor. Each of these hoppers, of which there are ten in all, carries exactly one ton, and it can be filled, raised, and discharged in something over a minute. On reaching the topmost floor a valve opens and the grain pours out in a steady stream upon an endless band of india rubber about 15 inches wide, which is kept in constant and rapid motion over a series of rollers. The effect of this motion is very curious. The corn keep its place exactly on the band; not a grain falls to the ground on either side until, on arriving at the point of discharge, a guiding shoot sends the stream into the section of the particular floor marked out for it. By a simple system of registration the keepers of this vast granary—which is believed to be the largest in the world—can point out with unfailing accuracy the whereabouts of each consignment in store. The precautions against fire are elaborate in the extreme—a fact which need surprise no one who remembers how cruelly Liverpool has suffered from its ravages in the past. In addition to the usual orders about lights, no steam engine is allowed in the place, and fire hose ready for use are fixed on every landing of every stair. The motive power of the engines is, as we have said, water, which is obtained from a lofty tower at the dock gates. The water is pumped into the machinery at the top of the tower by steam, the engine used for the purpose being capable of producing a pressure of 700 lbs. to the square inch. This same power is also utilized for the purpose of opening or closing the dock gates, and it is said to be even more perfectly under control than steam itself. One last matter of detail—the warehouses will hold 165,000 quarters of corn, and the elevators and machinery are capable, without any undue pressure, of lifting from the ships and putting into place in the warehouses 250 tons of corn per hour.—*British Trade Journal.*

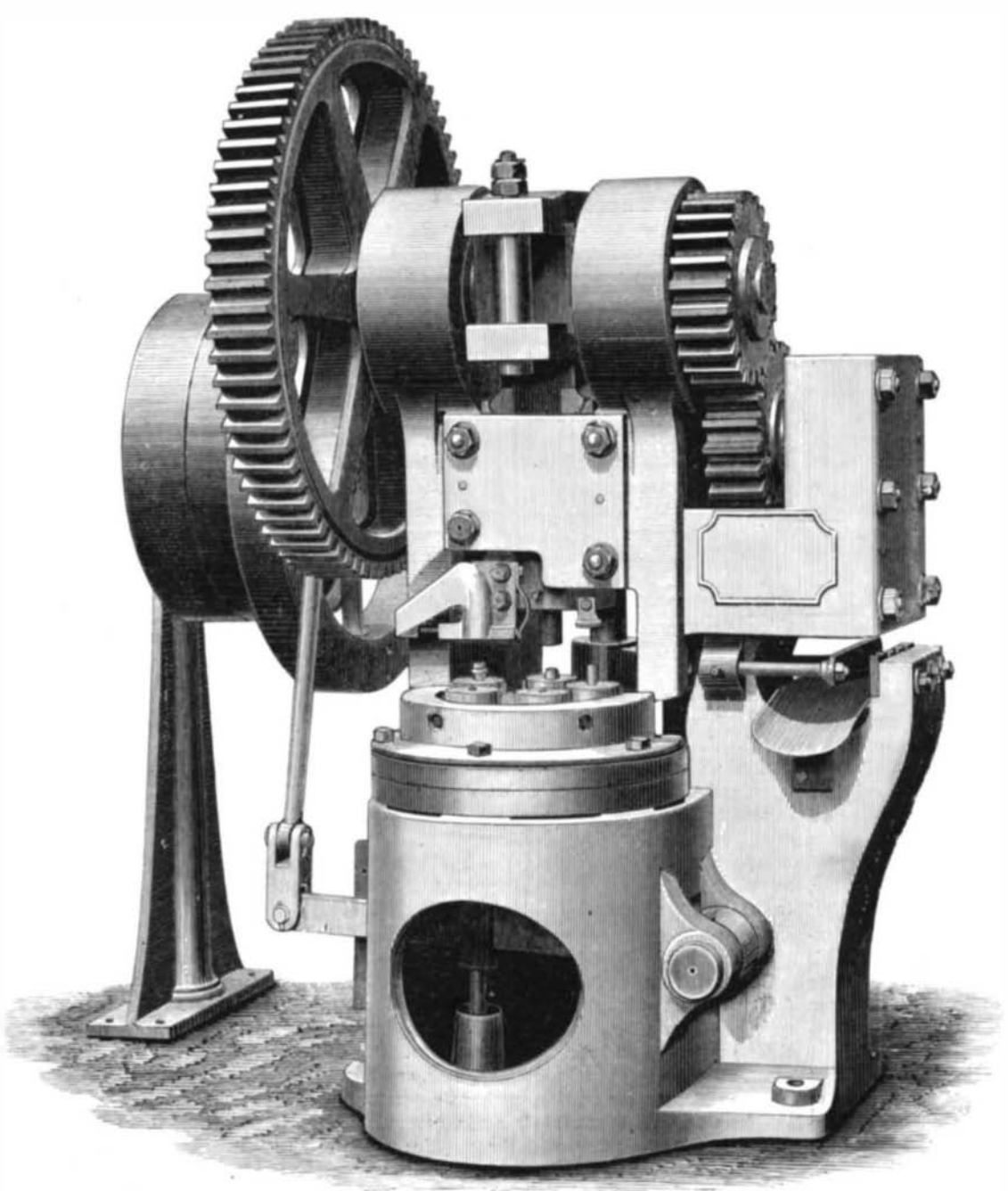
Fig. 2



STEAM ENGINE GOVERNOR.

IMPROVED RIVET-MAKING MACHINE.

We illustrate, from *The Engineer*, a new and simple rivet-making machine, recently patented by Messrs. W. Collier & Co., of Salford, Manchester, England. One of the great defects in all previous rivet-making machines has been their liability to form the head of the rivets out of center with the shank, and one of the principal objects Messrs. Collier & Co. have had in view has been completely to obviate this, and render it impossible to make crooked headed rivets in the new machine. The general design of the machine and its mode of working will be readily understood from our engraving. The header or "snap" is carried in a vertical slide which has a reciprocating motion imparted to it by an eccentric shaft driven by suitable gearing. The dies, five in number, are carried in a circular table and brought successively under the header or snap by an intermittent feed motion, which not only moves the table until the die is perfectly central with the snap, but locks it, and holds it firmly while the rivet is headed, so that should the iron get more to one side than the other it will right itself by pressure and not spring the table and form a crooked head. The motion for moving and locking the table is carefully protected from scale and water. An ejecting apparatus lifts the headed rivets out of the dies, and a simple self-acting motion picks them up and delivers them clear of the machine into a wrought iron trough or other suitable receptacle placed by the side of the machine. An apparatus is also attached for cutting the iron into the required lengths for making into rivets, with adjustable measuring stop to measure the pieces.



COLLIER'S RIVET-MAKING MACHINE.

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