BOILER PLATE TESTING MACHINE.

The engraving represents a testing machine recently built by Messrs. E. & T. Fairbanks & Co. for the United States Government, and placed in the office of the U. S. Steamboat Inspectors in the Post Office building in New York city. It is designed for testing the tensile strength of boiler iron, and has a capacity of 75,000 lb.

The weighing apparatus is a regular platform scale, and may be tested with standard weights to prove its accuracy the same as the ordinary platform scale. The strain is applied to the specimen of boiler plate by means of two screws and worm gears worked by a large gear wheel and a small pinion. By this arrangement of gears a man can easily apply 75,000 lb. strain with one hand.

The main beam, A, of the scale carries a poise or weight, B, which moves on rollers and may be run out to 75,000 lb. The light beam, C, has a finer graduation on it running up to 6,000 lb. The poise, D, on this beam, is moved automatically by an arrangement of clockwork, E, attached to the end of the beam.

The platform of the scale, K, rests on four knife edges in the main levers, F, one at each corner of the scale. These levers connect with the double lever, G, through which the strain is transmitted to the lever, H, and then through the lever, J, to the steelyard rod of the scale and by that to the beam, A.

The two columns, L L, with the cross-head and upper clamp, M, rest on the platform of the scale. The lower clamp, N, is secured to the cross-head, P, which is worked up or down by the two screws, R R, turned by worm gears S S, on their lower ends, which receive their motion from worms on the shaft carrying the gear wheel, T.

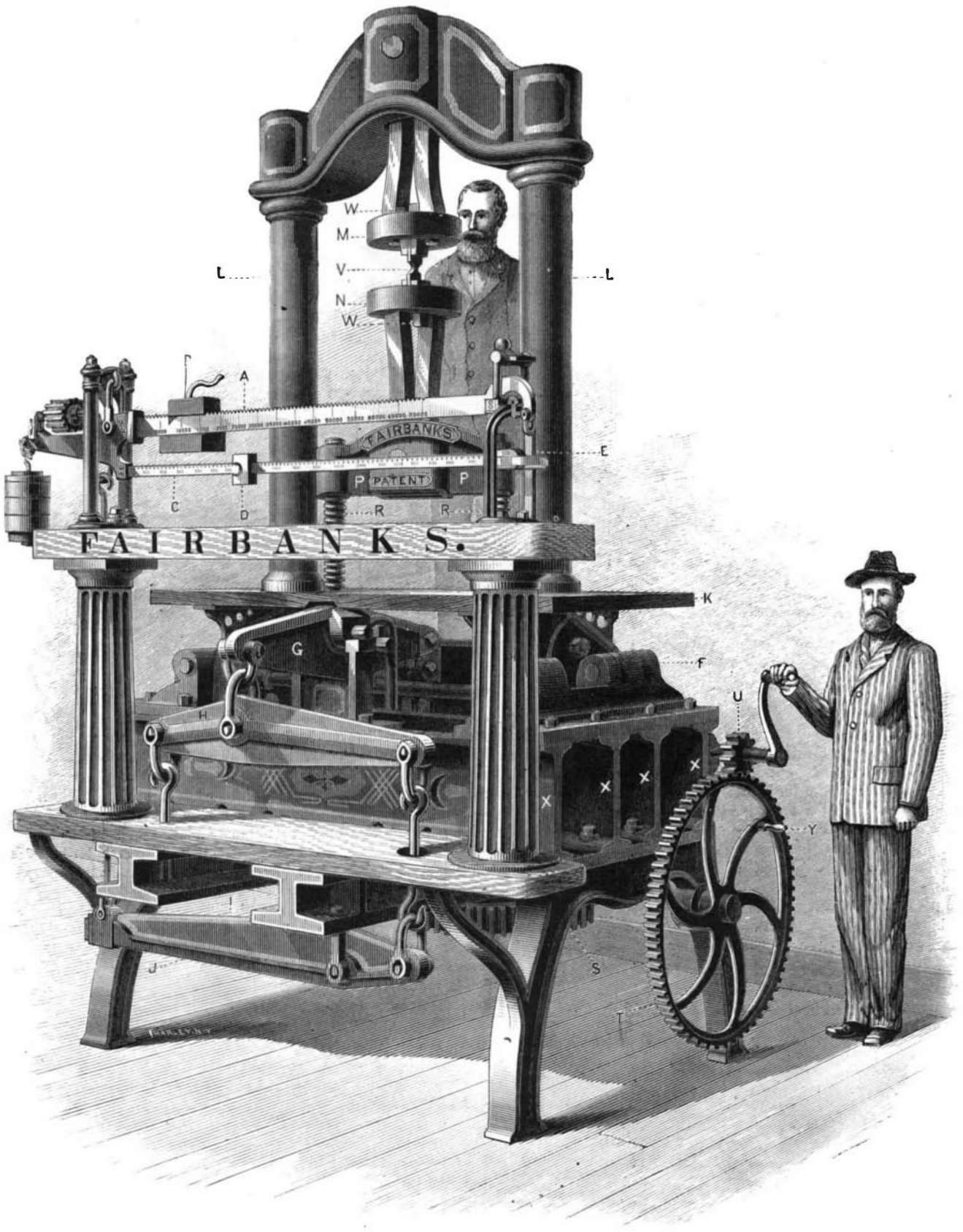
To make a test, the specimen, V, of iron to be tested is secured in the clamps, M N, by steel wedges, W W. When this is done the specimen is the only connection between the screws and gearing and the platform of the scale.

To begin the test the pinion, U, is shipped out of gear, and the gearing and screws are turned by the handle, Y, until a slight strain is applied to the specimen, when the pinion, U, is shipped into gear. As the strain on the specimen increases the beam of the scale rises, causing the automatic poise, D, to move along on the beam until it reaches the point equal to the strain applied to the specimen, when the beam drops and the poise instantly stops. This operation is continued until the specimen is broken, when the point at which the poise stands will indicate the exact number of pounds which were required to break the specimen.

We are informed that the Government has ordered two more of these machines, which are now on their way to Cincinnati and San Francisco.

This machine is believed to possess many advantages over other testing machines; its accuracy can be determined by actual test, the same as would be applied to any platform scale, and by the use of screws and worm gears, a steady strain can be applied and maintained for any length of time.

Machines on the same general principle as the one here represented, but changed in minor features to accommodate different test work, are also manufactured by Messrs. E. & T. Fairbanks & Co., whose office is at 311 Broadway, New York.



BOILER PLATE TESTING MACHINE.

Assyrian Vases.

The Museum of the Louvre, Paris, has just acquired two vases of large size, and of the utmost importance from the scientific point of view. They are two Etruscan vases of the earliest period, with paintings in white on a red ground. On one is seen a chariot attacked by a lion—a manifest imitation of Assyrian art—and a naval engagement between two very singularly shaped vessels. The other shows two lions rampant in the Asiatic style, and two Greek myths—the birth of Athena and the boar hunt of Calydon. It likewise bears an Etruscan inscription, one of the most ancient known. The representations of Hellenic fables had not been previously noticed on remains of Etruscan painted pottery of such early date, for the two vases may be confidently attributed to the eighth or the seventh century B. C.

The Bulwer Standard Mill.

This magnificent quartz mill consists of thirty stamps, and is built after the most approved plan. The ore will be run from the tunnel direct to the ore house, into two large bins, where it will be broken and screened, falling into the main body of the ore house that is connected with the batteries by automatic feeders, self-adjustable. These feeders are a model of mechanical ingenuity and well worth a visit. There are two distinct batteries of fifteen stamps, parallel with each other, working from pulleys on the same shaft placed on a center shaft between the batteries. The capacity of the batteries is about one hundred tons a day, depending on the character of the rock. The slum tanks are ranged on each side of the amalgamating room and are supplied with centrifugal pumps, and hose to charge the pans. The pulp is carried from the batteries to the slum tanks in sluice boxes, with openings over each tank to fill them, requiring but one man on each side to fill the tanks and charge the pans. The pans are set parallel with each line of slum tanks, and are furnished with a patent steam quicksilver pump. This pump saves handling of the quicksilver when cleaning up or charging the pans. Between the lines of pans is one open passageway, giving plenty of room for working purposes. The engine that drives this mass of machinery is a 225 horse power poppet valve, set in a parlor adjoining the amalgamating room. It works as smoothly and easily as a noiseless sewing machine, and is a splendid piece of mechanism, fitted up with the latest improvements, and handles the mill machinery with ease. The boiler room adjoining the engine room is large and spacious, with two sets of boilers, the steam drums as large as boilers for ordinary use. One of the boiler furnaces is built after the old style, the other set is fitted up with Box's patent fuel-saving furnace. It is claimed to save one eighth of the wood to do the same work as the old style of furnace. They are in use at the Justice mine, Gold Hill, and have been for the past eighteen months, and no doubt its competitor by its side will soon be replaced by the Box patent. The arrangement of this furnace, or its novelty in patent parlance, is the partition fire wall that extends close to the boilers, an arched opening being left on a level with the grate bars for draught, and extending back to an overhanging wall. The grate bars are set at an angle, and the coals from the furnace form a bed between the partition and the rear hanging wall; the draught carries the flames, gases, etc., over this bed of coals, a great heat being generated, igniting the gases and utilizing the heat for steam purposes; that with the old style of furnace passed away and up the smoke stack without igniting.

It strikes us as being a valuable invention, and one that must make a great saving in wood, and to mills or mines using large quantities this should be a material object. Bodie can now boast of one hundred and fourteen stamps in active operation, and in a few days ten more at the Spaulding mill will be started, when one hundred and twenty-four stamps will be crushing away day and night. This will more than double the former yield of bullion from Bodie.—*Bodie News.*

DR. AUERBACH, writing to the *Chemiker-Zeitung*, mentions as a curious fact that during an entire summer he observed water beetles—probably *Gyrinus natator*—living in tanks of a saturated solution of Glauber salt. When alarmed the beetles took shelter under the crystals, just as they do in ordinary circumstances under water plants. A little of the liquid so harmless to insects, having found its way by leakage into an adjoining river, proved fatal to multitudes of fish.