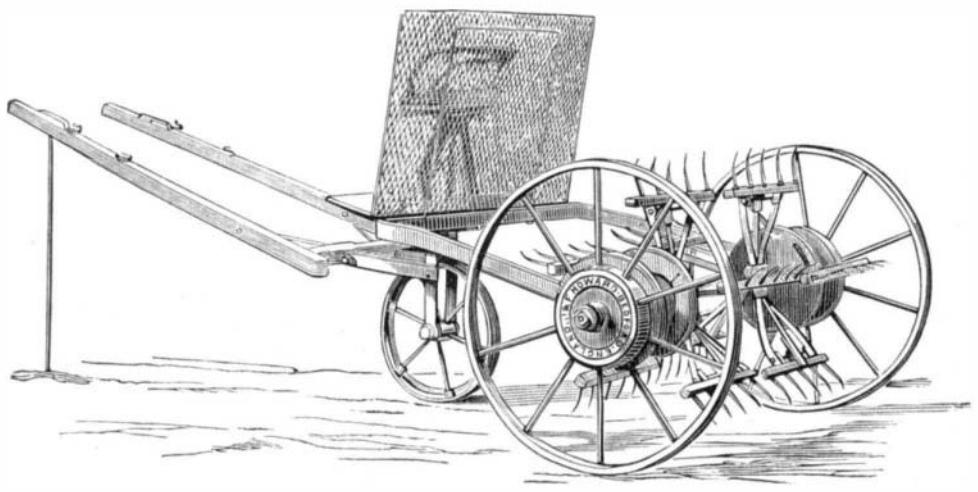
IMPROVED HAY TEDDER.

Our engraving shows a new hay tedder, invented and manufactured by Messrs. J. and F. Howard, of Bedford, England, a firm widely known for the excellence of their agricultural machinery, both as to design and manufacture.

The rotating forks are operated by the traction wheels, being made very light and easily operated; and the driver is protected from the shower of hay by a screen of wirework placed upright behind him The machine is easily drawn by one horse.

The simplicity of such devices ensures their moderate cost, and their consequent extended use in superseding manual labor. In changeable climates, the rapid drying of the hay is a matter of great importance, and the slow process of turning it by hand is vexatious as well as expensive to the farmer. These disadvantages are got rid of by the use of several machines, the one which we represent being among the latest and best for the purpose.



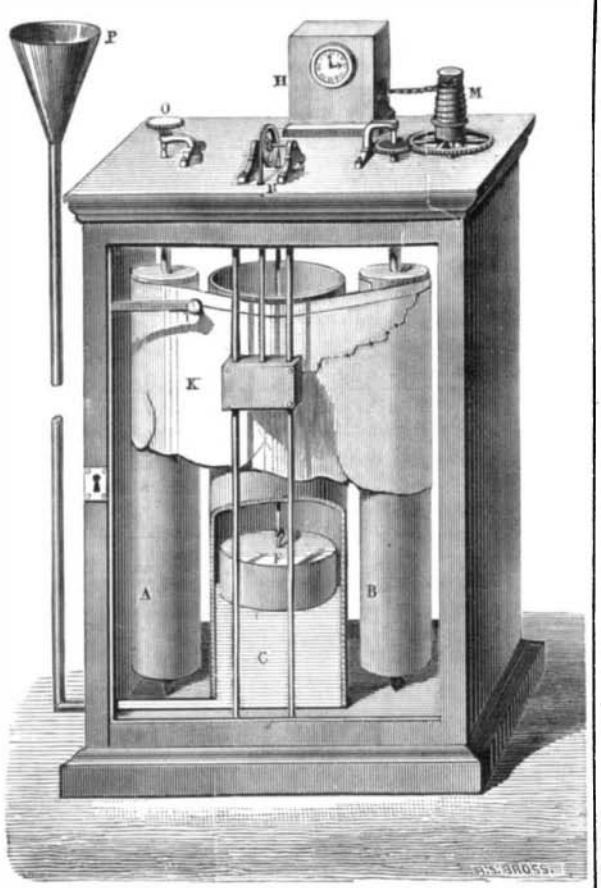
J. AND F. HOWARD'S HAY TEDDER.

Life-Preserving Pigeons.

Some very interesting and successful experiments have recently been conducted in France, with a view to determining whether lines could be sent ashore from a stranded ship by the aid of pigeons. It is in one of Mr. Charles Reade's novels that a means of escape is offered to a prisoner confined in a lofty dungeon. through some one shooting into his window an arrow to which a fine thread is found to be attached. The captive pulls the thread in and finds connected to it a string; the string gives place to a good sized cord, and the last to a rope capable of bearing his weight, and down which he descends. The pigeon from the wrecked vessel takes the place of the arrow, and, when liberated and naturally flying to the land, is able to convey thereto a thread 400 feet in length and 0·002 of an inch in diameter. People on the beach, by pulling on the thread, obtain a cord, and so eventually a strong rope completes the communication between ship and shore.

A NEW REGISTERING PLUVIOMETER.

The pluviometer is an instrument used to measure the quantity of rain which falls over a given surface, the knowledge of which fact is very useful in meteorological operations. The ordinary instrument, however, is defective in two points: First, it gives no record of the varying intensities or temporary stoppages of the rainfall; nor, second, does it afford any indication of the length of time during which such differences or stoppages in the intensity of the fall occurred.



M. Hervé Magnon has invented a new apparatus which satisfies the above want, and an engraving of the device is here presented, extracted from *La Nature*. A cylinder. C, receives the rain water led from the receiver, P. In the cylinder is a copper float, F, which, by means of a very fine cord passing over the pulley, N, is connected to the weight, K, which is a little the heavier. The weight, K, slides on two guides of tightly stretched pianoforte wire, and carries a pencil, the point of which comes in contact with the exterior of the cylinder, C. Inside the weight, K, which is hollow, is a small electric interrupter, which, whenever a current is transmitted to it from a regulator, strikes against the pencil and produces indicated points on a curve, which serves to control the clock movement by which are actuated the two copper cylinders, A and B. Over these last a belt of paper is passed, as shown; and the mechanism in H, which, as stated, moves them, is provided with a regulating fusee, M, so as to compensate for the difference caused in the diameter of the cylinder, B, by the rolling thereon of several thicknesses of paper. I is a fixed pencil which traces a horizontal base line on the paper. The latter, after first being rolled about the cylinder, A, is carried over cylinder, C, and attached to cylinder, B. In the middle cylinder sufficient water is then introduced to completely buoy up the float, F. If rain falls, the float, by the addition of water beneath it, is lifted; and the weight, K, following the movement, the pencil thereon traces a curve on the paper, which gives in millimeters the corresponding depth of rain. If, on the contrary, no rain falls, the line left by the weight pencil is straight and parallel to that made by the fixed pencil.

The Use of Plaster in Architectural Decorations.

In the earliest written records we hear of mortar being used as a plaster, while examinations of ancient Asiatic remains attest the fact. The Romans, we know, largely used plaster incrustations on their brickwork. The Coliseum shows plastered surfaces, and the early gothic structures were largely faced with stucco. It is a mistake to imagine that the middle age builders never used such a material. In many of the earlier churches and monasteries we find rubble walling; and a coarse rubble used in the vaulting, which was covered with a rough plaster, and probably decorated. Painted decorations have been discovered on the walls, and no doubt the vaulted surfaces were sometimes also relieved by color. The existence of plaster on the vaulted surfaces is proved in many instances by the ribs of the groining projecting before the face of the rough rubble filling-in, which formed a good key to the plastering. Netley Abbey and many other monastic buildings of the twelfth and thirteenth centuries may be cited.

"The subject of internal incrustation," says Mr. Pullan, "leads us to speak of the use of colored mortar for this purpose. . . . Painting cement and stucco has not been found advantageous, though the custom largely prevails. Painting the surface of calcareous cement does not improve it; the paint retards the induration by cutting off the air; and a sufficient time to allow of perfect evaporation of moisture is required. The same authority asserts that, if paint or oil be applied on stucco, it ought not to be used in less than a year after the incrustation is made. This observation is confirmed by plasterers and painters.

"But the employment of different ingredients with mortar shows far better results, that may be turned to account in decorative plastering. Metallic substances like antimony, white lead, arsenic, martial pyrites, are injurious; they give colors which are not permanent, and calcareous cements exposed to the weather are found to be best without metallic matter. Among the more durable ingredients for imparting color, without injuring the cement, may be mentioned colored sands, and coarse powder of durable colored bodies. Thus Thames sand produces a gray tint like Portland cement. Yellow and other beautiful colored sands are obtainable in the Isle of Wight, Croydon, etc.; or colored glasses or stones, in place of sand or partially, may be employed to give deeper tints. These should be beaten to a coarse powder, the fine portions being washed away as injurious to the cement. Colored mica and marble may also be used in external plaster work instead of paint. Bone ash produces by admixture a pleasing gray, which may be contrasted with brighter stuccoes of sand. Substances insoluble in water have been found best for the purpose of tinting cements, while sulphurated and metallic powders impair them for external use. Colored calces of iron produce a deep tint, and may be used in internal incrustation. Any colored, hard, gritty body may be incorporated with mortar for incrusting purposes. We have made great advances lately in this direction. The sgraffito treatment of plaster is one that admirably shows what artistic effects may be produced by simple means in fit colors and relief: though it seems to us, more may be done in tinting our plastered surfaces in light tones, and in rendering paint and paper less necessary for finished decorations."—*The Church Builder.*

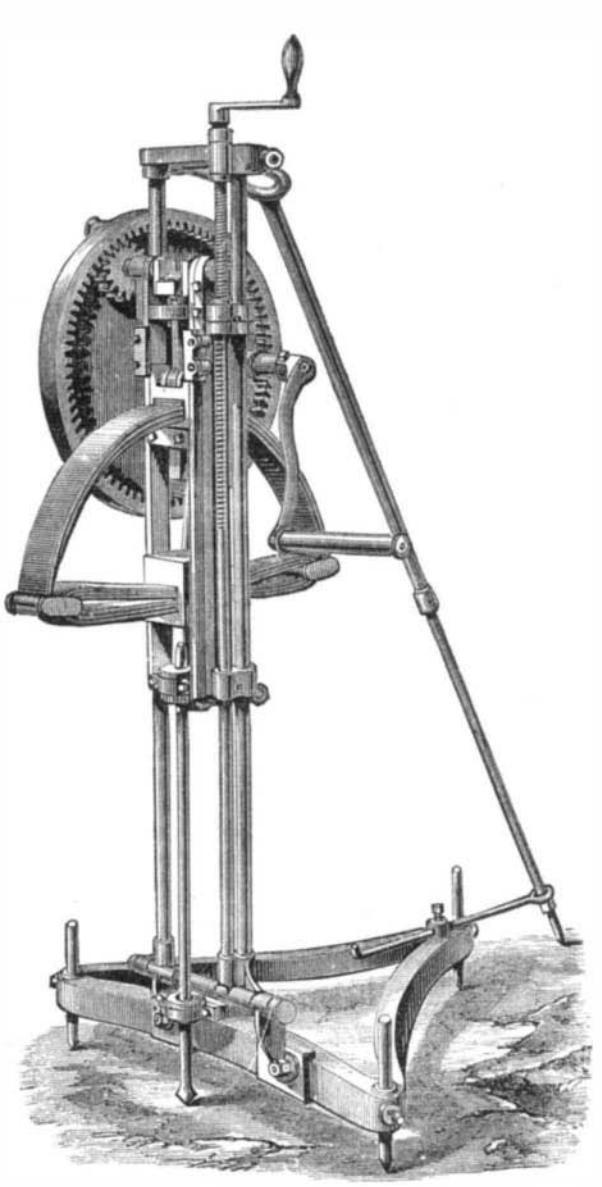
SPIDER web silk is 6·3 times finer than that of the ordinary silkworm.

Grease Butter in the English Courts.

The English butter men have revolted against the grease butter, and the English *Grocer* publishes a vehement editorial, demanding a law to the effect that people who make grease butter shall inform the public of the fact by marks on the packages. Somehow John Bull fails to comprehend the butter question as clearly as astute American dealers have done. Here is a report of a case where a London grocer is summoned for selling as butter a pound of something which the complainant avers does not contain a particle of the genuine article. The trial comes off, learned professors swear to flatly different statements, and the magistrate paradoxically and complacently observes that he is "perfectly satisfied with the analysts on both sides," whatever that may mean. The composition of the grease stuff is adjudged to be "consistent with genuine butter;" whereupon the *Grocer* rises in its wrath and insists that the butter, which a jury of its countrymen solemnly pronounces to be butter, is not butter, but a "curious mixture of fats." There is an exasperating obscurity about the whole business. As near as we can understand it, somebody has been feeding the British Lion on grease butter, which that noble beast has eaten innocently, and relished; but now, having discovered a fraud, he roars to have the noxious substance pointed out to him, in order that he may not commit the error of eating it again. "Where ignorance is bliss, 'tis folly to be wise" doubtless will hereafter be the British grease butter man's motto. Similar stuff is now being sold in France.

ROCK-DRILLING BY HAND POWER.

We select from *Engineering* an engraving of a rock drill operated by hand, intended for use where neither steam nor pneumatic power is available. It has recently been patented by Messrs. H. B. Barlow, Jr., & Co., of Manchester, England. The machine consists of a light stand, supporting guides which can be adjusted to various inclinations, the particular machine shown being adapted for drilling holes vertically or at angles down to 45°. The boring tool is not connected to the hammer, but rests on the rock, being merely guided by the collars through which it passes and which insure its being kept parallel with the hole which is being formed. One of the guide collars has an intermittent rotary motion given to it by a ratchet, thus causing the tool to be partially rotated after each blow.



The tool is struck rapidly by a steel-faced hammer worked by a crank through the medium of a spring. The throw of the crank is 1¼ inches; but when in full work the hammer, under the action of the spring, moves about double the stroke due to this throw, a speed of 40 revolutions per minute of the handle causing 212 blows per minute of about 5 inches fall to be struck by the hammer. The machine was awarded a prize at the recent exhibition at Manchester.