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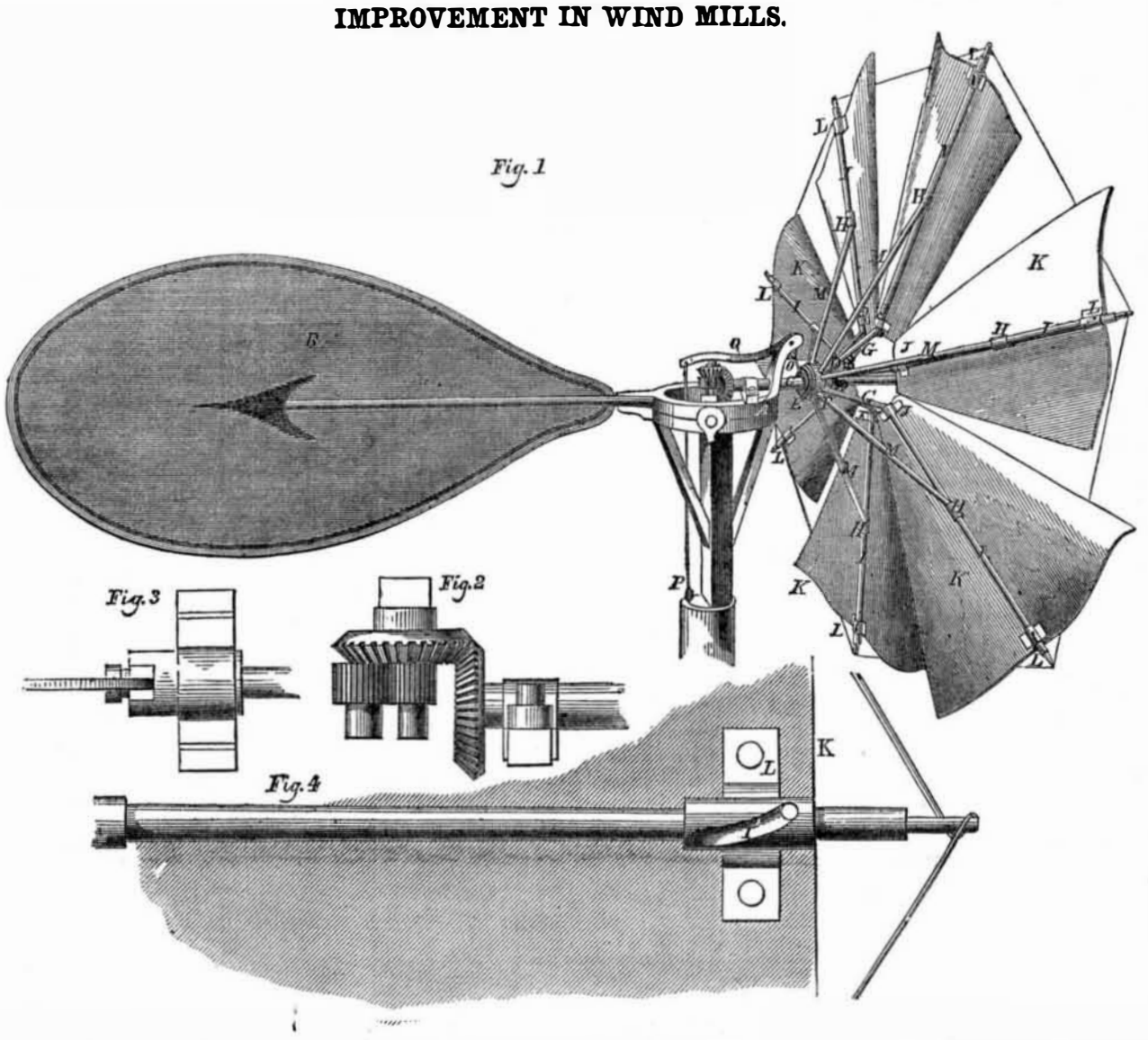
Agricultural Science, Droughts, and Pulverizing the Soil.

The State Agricultural Chemist of Maryland, Mr. Higgins, has published a paper showing the necessity of droughts to replenish the soil with mineral substances, carried off to the sea by the rains, and also taken up by the crops, and not returned by manure. These two causes, always in operation, would, in time, render the earth a barren waste, in which no verdure would quicken, and no solitary plant take root, if there was not a natural counteraction by drought, which operates to supply this waste in the following manner: During dry weather, a continual evaporation of water takes place from the surface of the earth, which is not supplied by any from the clouds. The evaporation from the surface creates a vacuum, so far as water is concerned, which is at once filled by the water rising up from the subsoil of the land; the water from the subsoil is replaced from the next strata below, and in this manner the circulation of water in the earth is the reverse to that which takes place in wet weather. With this water also ascend the minerals held in solution, the phosphates and sulphates of lime, carbonate and silicate of potash and soda, which are deposited in the surface soil as the water evaporates, and thus restores the losses sustained as above stated. The author of this theory appears to have taken considerable pains to verify the fact by a number of interesting experiments. The subject is worthy the attention of men of leisure and of education, who pursue the rational system of blending chemistry with agricultural science."

[The above is from the Philadelphia *Ledger*, and contains evidence within itself of correctness. In connection with this, let us point out the benefits of keeping the soil well pulverized or cultivated, to prevent the mineral and other food of plants from being carried away with rains. England has a moist climate, subject to great rains, and is seldom visited with droughts, and yet more wheat is raised to the acre than anywhere in the world. Why is this? Simply on account of the universal practice of draining and keeping the soil in a highly pulverized state. When the soil is kept porous, it absorbs ammonia and carbonic acid gas from the atmosphere, and when rain falls these are carried down into the soft porous soil, and are taken up as food by the plants. If the soil were hard and caked, the rains would run violently off the surface, carrying away some portion of the soil, and with it the food so necessary to supply the plants with nourishment. The benefits to be derived from keeping the soil of cultivated fields well pulverized and open, cannot be too highly extolled.

We regret to learn that Mill No. 1, Manchester, N. H., was burned down on the 15th inst. It caught fire by the bottom of the watchman's lantern dropping off among some roving in the carding room. The loss amounts to about $200,000, and 500 hands are thrown out of employment.

IMPROVEMENT IN WIND MILLS.



The annexed engravings represent an improvement in Windmills, for which a patent was granted to Addison P. Brown, of Brattleboro', Vt., on the 3rd, of this month.

The nature of the improvement relates to the method of regulating the obliquity of the sails, by which they are rendered self-adjusting, according to variations in the velocity of the wind.

Figure 1 is a perspective view of the principal parts; fig. 2 is a view of the gearing for transmitting the motion from the wind or driving shaft to the main driven vertical shaft, and figs. 3 and 4 are sections—the latter on an enlarged scale, showing an arm of the wind sail, and the curved slot, I', which allows the sail to adjust itself to the wind pressure. Like letters represent similar parts. A is the turn-table on which the wind shaft is supported and rotates; B is the vane; C is the main driver shaft rotated by the wind sails. D is a collar securely fixed on this shaft by a screw. E is the hub which carries the sails. It is allowed to slide on the shaft, C, to which it is secured by a key working in a spline or slot, but rotates with the shaft. F is a spiral spring, having its tension to keep the collar, D, and hub, E, separate. G G are metal bars, connected by hinges to the hub, D. H are thimbles which slide on the arms, I, that carry the sails. J J are hinges firmly attached to the sails, K K. L is a hinge (one on each arm) it is heavy, being virtually a weight, the centrifugal force of which governs the sail; this hinge is also a thimble enclosing the arm of the sail, as shown in fig. 4, and it has a helical slot, I', in it in which is a pin, that turns the sail edgewise, when the centrifugal force of L is increased by an accelerated speed. M M are braces which extend from the arms of the sails to a sliding collar on the other side of the one D. O is a sliding washer pressed up against the hub by a weight, P, suspended from a jointed bent lever, Q, thus enabling the attendant to increase the force of the spring, F, by increasing the weight.

Any sudden impetus of the wind moves the sliding hub, overcoming the tension of the spring, F, lifting the weight, P, and the bars, G, by means of the thimbles, H H, which push the sails further out upon the arms, while the helical slots, I', and pins in them turn all the sails simultaneously edgewise, to an extent proportionate to the increased force of the wind. Any acceleration of the wind regulates the positions of the sails, as described, and thus they are self-adjusting. The motion is communicated from the shaft, C, by bevel gearing, as shown in fig. 2, or in any of the usual ways whereby rotary motion is communicated to the vertical shaft, and from thence to any machinery in the building below.

More information may be obtained by letter addressed to the patentee, at Brattleboro', Vt.

Grasses for Reclaiming Sand Drifts on the Sea Shores.

There has been received in the Patent Office, from Holland, the seeds of the sea reed, (*arundo arenaria,*) and the upright sea lyme grass, (*elymus arenarius,*) which have long been used in that country for reclaiming the sand drifts on the sea coast. These seeds have been imported for experiment all along the Atlantic coast, from Maine to Florida. The nutritive matter of these grasses is not sufficient to make them worthy of cultivation out of the influence of the salt spray. The elymus arenarius rather exceeds the sea reed in nutritive qualities; but from the habit of the latter in its natural place of growth, it is of greater utility, particularly when combined with the former, as it binds the loose sands of the sea shore, and thereby raises a durable natural barrier against the encroachments of the ocean upon the land. Indeed, the effect of the two grasses combined in protecting coasts from the wasting influences of storms and currents is such, that Holland owes her very existence, in a considerable degree, to their preserving influences.

In the reign of George I., the acts passed for the planting and preserving the same from injury were extended to the coasts of England. In passing further penalties for its inviolability, it was rendered penal not only for an individual—not even excepting the lord of the manor—to cut the bent, but for any one to be in possession of any within eight miles of the coast. This plant is also applied to many economical purposes—hats, ropes, mats, &c., being manufactured from it.

A New Destructive Bomb Shell.

A number of our cotemporaries state that Prof. Anderson, formerly of the Clinton Institute, has invented a new destructive shell, which can soon wrap any fortification in flames, and destroy any city in fifteen minutes. From the description of it, Sebastopol will soon be nowhere. When it is fired and strikes, it sends up a large sheet of flame, which burns with great intensity for a considerable period. It appears to be a shell filled with combustible materials, such as turpentine, resin, chlorate of potash, ignited much in the same way as the explosive shells of Mr. Hubbell, of Philadelphia.