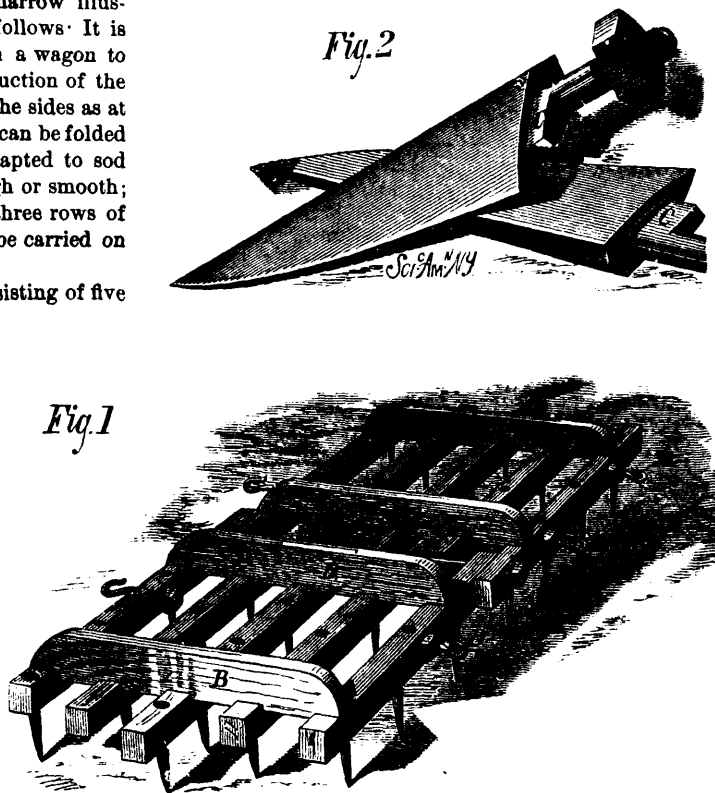


DOBBIN'S IMPROVED HARROW.

The advantages claimed for the improved harrow illustrated in the accompanying engravings are as follows: It is easily portable, and need not be placed upon a wagon to transport it to and from the field; the construction of the teeth enables work to be done equally well at the sides as at the middle; the parts being hinged, the harrow can be folded into small space; the teeth are especially adapted to sod ground, and work well whether the soil be rough or smooth; by removing two or three teeth for each row, three rows of corn can be cultivated at once, and this can be carried on until the plants are several inches high.

The frame is made in two sections, each consisting of five parallel crossbars with transverse pieces as shown in Fig. 1. The sections are hinged by the long bolt, A, passing through the overlapping ends of the bars. The ends of the transverse bars, B, are rounded to adapt them to serve as runners when the harrow is turned over to enable it to be drawn from place to place. The teeth are separately shown in Fig. 2, and are made wedge-shaped so that they will cut sods, etc., clear themselves of rubbish, pass through the ground easily, and enter it to greater depth. The shanks of these teeth are passed through holes in the bars and secured by nuts. Projections, C, on said shanks prevent the teeth from turning. To the front and rear bars are attached hooks, so that the harrow may be drawn with the inclined or the straight edges of the teeth forward, as may be desired. By means of the hook, D, the draught may be applied to the lower section when the two sections are folded together.



DOBBIN'S IMPROVED HARROW.

CORROSION OF MACHINERY BY THE USE OF ANIMAL OILS.—Often in removing the cylinder head and plate covering the valves of an engine, we see evidences of corrosion or action on the surfaces differing entirely from ordinary wear, and the engineer is generally at a loss how to account for it. According to the general impression grease or animal oil is a preservative of the metal, and is the last thing suspected of being the cause of its gradual disintegration.

Animal fats consist of what are known as the "fatty acids," such as stearic, margaric, oleic, etc. These acids are combined with a base, and under ordinary conditions are neutral to metals generally, and on being applied they keep them from rusting by shielding them from the action of air and moisture. But in the steam cylinder, a new condition is reached. These oils are subjected to the heat of high-pressure steam, which dissociates or frees these acids from their base, and in this condition they attack the metal and hence destroy it. This applies as well to all oils of animal origin, fish or sperm oil included, although a pure article of the latter does so only to a very slight extent, but its very high price and exceptional purity precludes its economical use. Petroleum and oils derived therefrom (generally called mineral oils) are entirely free from this objection. Petroleum contains no oxygen, and hence without that it cannot form an acid and therefore cannot attack metal. It is entirely neutral, and so bland that it may be, and is, used medicinally as a dressing to wounds and badly abraded surfaces where cerates or ordinary dressings would give pain. A conservatism, founded more on prejudice and want of proper information than anything else, has existed for some years, which clings to the use of animal oils in defiance of reason and economy, but which, like all the so-called conservatism, is gradually yielding to the advancing scientific spirit of the age. There are but few cases in which mineral oils cannot now supersede the old-fashioned organic or animal oils. Improvements have been and are now being made, and oils from petroleum are now produced suitable for nearly every mechanical process for which the animal oils have heretofore been used, not excepting those intended for cylinder purposes. Another objection attaching to the old animal oils is absent in petroleum. Thus if, through the exhaust steam, some of the animal oil be carried into the boiler, foaming or priming is the consequence, but the same thing happening in the case of petroleum is rather of benefit than otherwise, for it not only does not cause foaming, but it prevents incrustation or adhesion of the scale or deposit and this aids in the preservation of the boiler, and the latter is perhaps the best preventive of the many everywhere suggested.—*Iron*, ix, 284.

NEW SOURCES OF INDIA-RUBBER.—It is well known that rubber abounds in the milky juices of many plants besides the caoutchouc-tree; for example, lettuce and dandelion. A company has been formed in London, Ontario Province, for the extraction of caoutchouc from milkweed (*Euphorbia corollata*), the juice of which contains some four per cent. of rubber. The plant is partially decomposed, steamed, then treated with coal-tar naphtha, which, being distilled, leaves the residuary caoutchouc in the solid form.