It was long recognized that the precision which is of the essence of good sowing could be better attained by mechanical means, and as early as 1662 a sowing-machine was invented by Joseph Locatelli in Carinthia. In England the early history of mechanical sowing is chiefly connected with the name of Jethro Tull, who about 1730 invented the corn-drill.@@1 Cooke’s drill brought out in 1783 was the definite precursor of the modern drill. The drill, besides depositing the seed at a uniform depth, sows it in parallel rows at equal distances from one another and thus makes possible the use of the horse hoe and facilitates the suppression of weeds amongst growing crops, the latter advantage being specially marked in the case of root crops. The “ cup-feed ” and the “ force-feed ” are the commonest and most generally useful types. The cup-drill consists of a long box carried upon wheels and divided diagonally into two sections by a partition. The forward section contains the seed which drops through apertures, the size of which can be regulated by slides, to the bottom section. A spindle geared to the ground- wheels by cogs passes longitudinally through the centre of this section and carries disks, round the rims of which are fitted small cups. As the horses pull the drill forward, the spindle and disks revolve and the cups scoop up the seed and pour it into the funnels; thence it proceeds down a series of tubes or “ spouts ” and drops into shallow furrows traced by small coulters travelling immediately in front of the streams of seed. The coulters can be raised or lowered by levers and are kept down to their work by weights or pressers, which can be regulated according as deep or shallow sowing is required.

In the force-feed type of drill the seed falls through apertures in the bottom of the seed-hopper into funnels, through which extends a shaft carrying bowl-shaped wheels, one for each (fig. 1). These wheels are either spirally- grooved inside or else cogged and serve to feed the seed regularly into the tubes. Instead of coulters, the drill is often fitted with shoes or revolving disks, similar in action to those of the disk-harrow. The tooth and brush pinion, the per- forated disk and the chain feed drills, are other types differentiated according to the method by which the seed is “ fed ” from the hopper and the kind of crop being sown.

Liquid-manure drills distribute chemical manure mixed with water and are often fitted with a seed-box for root seeds, the manure and the seed being deposited through the same spout. Drills are also made in which dry fertilizers may be deposited with the seed in a similar manner.

The wheelbarrow seeder, a long box pierced with openings and carried transversely on a skeleton wheelbarrow, is used for sowing grass seed.

In the United States the maize or Indian-corn crop exceeds all others in value, and machines used in planting and handling this crop are of great importance. Corn (maize) is sometimes listed or planted in a continuous row like wheat, and for this purpose a machine known as a lister is employed.

In its general construction this machine is a sulky plough, having a double mould-board, which turps the furrow in both directions. Immediately behind the plough is a sub-soiler for deepening the furrow and penetrating to the moist soil below the surface. A seed­box is mounted on the plough beam, and is provided with a feed-plate operated by a shaft geared to one of the wheels. The seed is

delivered to the furrow in rear of the mould-boards and covered by two shovels fixed behind which turn the soil back into the furrow.

It is, however, more common to plant maize in hills, which are spaced equally from each other and form rows in both directions, so that a cultivator may be driven between them. This work is done by a machine called a check-row corn planter.

In using the corn planter, a wire, having buttons attached thereto, at intervals corresponding to the distance between the hills, is first stretched across the field and anchored at its ends. This wire is then placed upon the guide rollers at the side of the machine and passes between the jaws of a forked lever, which is connected at its other end with a rock-shaft passing across the machine and serving to oscillate a feed-plate in the bottom of each seed-hopper. As the buttons on the check-wire strike the forked lever, the latter is drawn to the rear and causes the feed-plate to drop the seed through the tubes into the open space between the plates of the furrowing shoe. A reel at the rear of the machine is used to take up the check-wire as the planter progresses.

In another corn planter the check-wire is dispensed with, and the machine is provided with a shaft carrying two reels, the blades of which are at a distance apart equal to the distance between the hills of corn, and thus measure the intervals at which the corn is to be dropped. A rod, extending from the side of the machine, and carrying a small wheel, marks the next row and serves as a guide to the driver.

See J. B. Davidson and L. W. Chase, *Farm Machinery and Farm Motors,* p. 132 (New York, 1908).

**SOYER, ALEXIS BENOIT** (1809-1858), French culinary artist, was born at Meaux-en-Brie, France, in October 1809. After five years’ apprenticeship as a cook near Versailles, he was engaged by a well-known Paris restaurateur, and soon became chief cook. Leaving France at the revolution of 1830, he went to London and joined his brother in the kitchen of the duke of Cambridge. Subsequently he was cook in several noblemen’s kitchens, and in 1837 was made chef to the Reform Club, London. In 1847, having written several letters to the press on the famine in Ireland, he was commissioned by the government to establish kitchens in Dublin. In 1850 he resigned his position at the Reform Club, and the following year opened Gore House, Kensington, as a restaurant, but this venture did not prove a success. In 1855 he offered, through the medium of *The Times,* to proceed at his own expense to the Crimea and advise on the cooking for the British army there. His services were accepted by the government. On returning from the front he lectured at the United Service Institution on cooking for the services, and reformed the dietary of the military hospitals, and of the emigration commissioners. He

@@@1 The machine devised by Josiah Worlidge about 1669 was ineffective in practice and differed totally in structure from that of Tull.