

**HARVESTER, COTTON.** The difficulties in the way of a successful cotton-harvester arise from the peculiar nature of the crop. A field of cotton is not harvested once for all, as is a field of grain, chiefly because the cotton on the plant does not ripen all at once. It therefore may happen that on the same plant there may be lint, ready for picking, immature bolls, and even the flower or bloom. In the eastern States of the South it is common to gather three crops; the first early in the autumn, the last usually in December. It is, therefore, essential beyond all other considerations, that a cotton-harvesting machine should be so constructed that it will remove only the lint from the plants, and nothing else. This implies two things: first, that the plant itself, with its bolls and blooms, shall be left unimpaired by the action of the machine; and, second, that the gathered cotton shall be free from leaves, sticks, or other trash. The early attempts at inventing cotton-machines, and most of the modern efforts, have failed because of non-fulfillment of one or the other of these conditions. The trouble with most of them has been that they would not only gather the cotton, but a good deal of the plant at the same time; and even if this were not detrimental to the harvesting of subsequent crops from the same plant, it would be fatally uneconomical, for the reason that the cost of getting the trash out of the cotton which is gathered far overbalances the gain incident to the use of machine-picking. It has become almost a maxim in the South that "cotton can only be picked by brains." A great many machines have been devised which have failed simply because they could not get at the cotton at all. Others have been provided with claws and fingers, and all kinds of catching contrivances, which would entangle the cotton, but which, as already stated, would make no discrimination between lint and trash. The makers of the earliest machines discovered that large claws or fingers would generally pick the boll with the lint, and then the sizes of the fingers or claws were diminished, until finally it was attempted to gather cotton with ordinary card clothing. After this came attempts to pump the cotton from the plant; and then followed efforts to make it adhere to an electrically excited belt. None of these attempts has been even measurably successful. Most of the inventors have erred in the belief that what is wanted in a



FIG. 1.  
Stem tooth.

cotton-harvester is a machine which will imitate the operations of a man in picking cotton. This is a mistake. What is wanted is a contrivance which will not only take cotton off the plants, but which will take nothing but cotton; or, in other words, which will discriminate. The most promising cotton-harvester which thus far has been produced is that invented by Mr. Charles T. Mason, Jr., of South Carolina; and, so far as is known, Mr. Mason appears to have been the first person to have recognized the correct principles of cotton-harvesting as above briefly outlined. He invented, first, what he calls a "stem," which is a device which will take cotton and nothing but cotton from the plants. He has also invented several forms of machines which operate that stem to bring it into contact with the cotton out of the successive plants of a row. The principle of Mr. Mason's stem will be readily under-

stood from Fig. 1, which represents a piece of thin sheet-metal, *A*, in which has been cut a V-shaped slot, *B*. This slot is shown in the figure very much enlarged over actual size, its length, in practice, being about a third of an inch. In the metal plate is punched a series of these V-shaped slots arranged in rows, after which the plate is corrugated and bent to form a cylinder or completed stem, as shown in Fig. 2. It will be noticed that in the slot *B* there is formed a sharp tooth *L*. This tooth is so placed that it does not project above the surface of the cylinder or stem, or, in other words, it is guarded by the adjacent metal. It will also be observed that there is considerable open space in the slot in front of the tooth *L*. Now, when the stem, Fig. 2, is brought up to a mass of loose cotton lint, the latter, by its own elasticity, will enter the space in front of the tooth *L* and will become engaged. When the cylinder or stem is



FIG. 2.  
Stem.

turned with the points of its teeth foremost, nothing which is not as elastic as cotton will enter the space in front of the tooth, but the surface of the stem will slide or rotate in contact with it. Therefore it is impossible to make the stem gather leaves, or stalks, or bolls, or any other hard substance. So accurately will this stem discriminate, that it may be taken in the closed hand and rotated point foremost, and yet will not scratch the skin; but the instant that it touches the elastic cotton, engagement follows. It will be obvious that, in order to use such a slot as this, a mechanism must be provided which will rotate the stems points foremost, gather the cotton, and then rotate them in the opposite direction to throw the cotton from the teeth. The mechanism must also carry the stems bodily into and out of the plants, while the machine itself is progressing forward along the row. It will be clear that there are many ways in which this can be done. Thus, the stems, mounted on suitable frames, may be dipped into the plants from above, which perhaps is objectionable on account of the necessary height to be given to the machine, or they may be introduced laterally. One form of the machine which Mr. Mason has devised, and which has been successfully used, is illustrated in Figs. 3 and 4, Fig. 3 being a vertical section and Fig. 4 a plan. The body consists of a box-shaped frame mounted on two wheels. The frame is divided into two parts or sections, with a passage-way in the center, so that the machine, so to speak, straddles the cotton-row. In each section of the machine there is a vertical shaft, and on this shaft the cotton-stems are arranged radially and in tiers one above the other. Motion is communicated to the shaft by gearing from the wheels, so that the shaft rotates, and in so doing carries the stems into the plants, and then into the compartments of the machine. In connection with the stems a reversing gear is arranged, so that the stems are made to turn on their own axes, points forward, while in the plants, and in a reverse direction when they enter the boxes. The stems, therefore, gather the cotton, carry it into the boxes, reverse, and thereby clear themselves of the cotton; and the latter then falls upon a horizontal belt, which conveys it to the rear, where it engages with elevator-belts, and these in turn carry it upward and deliver it into the bags hung on the rear of the machine. The machine is drawn by a horse or mule, and as it passes over the rows of plants the stems are carried backward in each rev-

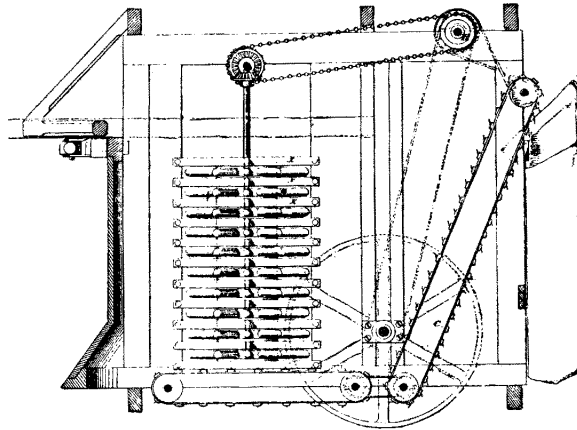


FIG. 3.—Mason cotton-harvester.

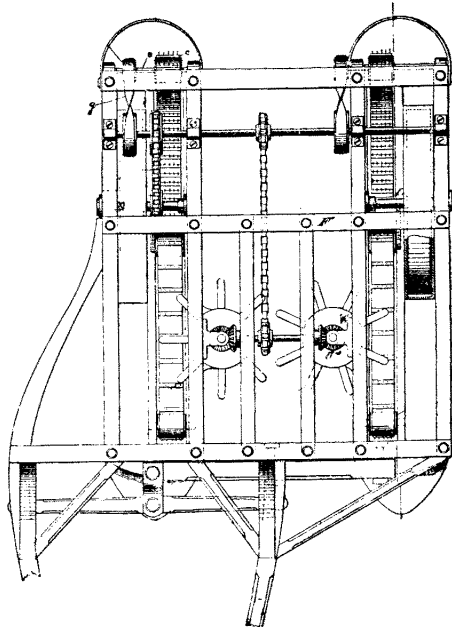


FIG. 4.—Mason cotton-harvester—plan.

it to the rear, where it engages with elevator-belts, and these in turn carry it upward and deliver it into the bags hung on the rear of the machine. The machine is drawn by a horse or mule, and as it passes over the rows of plants the stems are carried backward in each rev-

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olution at the same rate of speed as that at which the machine moves forward. Therefore, the stems are practically stationary in the plants, and all dragging is prevented. Actual experiment has proved that the capacity of this machine is from 3,000 to 3,500 lbs. per day. A committee of the National Cotton Planters' Association has reported that, under conditions of actual test, "the machine gathered a fairly clean cotton at the rate of 240 lbs. of seed-cotton per hour from plants that would not yield more than 1 bale of line cotton to every 3 acres"; and that the committee could "discover no damage done in the operation of the machine to the plant in any way, either to the unopened bolls or the leaves on the stalk." The machine described is manufactured by the Mason Cotton Harvester Company, of Charleston, S. C., and further details concerning it will be found in the following letters-patent granted to Mr. Charles T. Mason, Jr., namely, 286,032, Oct., 1883; 293,484, 293,485, Feb. 12, 1884; 311,344, Jan. 27, 1885; 312,647, Feb. 24, 1885; 331,514, Dec. 1, 1885; 337,007, March 2, 1886; 345,246, July 6, 1886; and 345,312, July 13, 1886.