

Gin. Cotton gins are of four principal kinds, the *roller*, *comb*, *saw*, and *needle* gins. The comb is Spanish (*almarraes*), and has mechanical importance.

The roller gin is found throughout India, Malaya, and China, and has received its proximately perfect development in the Macarthy gin and its relatives.

The Macarthy double roller gin made by Platt Bros., of Oldham, England, has, as its name implies, two rollers instead of one, the feeding hopper being between the two. In the familiar Macarthy gin a reciprocating blade is employed in conjunction with a fixed blade and roller, but, in this later form of gin, two reciprocating blades come into action alternately. A simple contrivance regulates the feeding, making it uniform, and another regulates the pressure of the knives, called in the American Macarthy gin, *stripper blades*, so as to adapt them to the work of the moment, and allow an obstruction to pass through without clogging or arresting the machine, or breaking the knife or stripper-bar.

The rollers are covered with walrus leather, far more durable, and, from its peculiar texture, superior to sole leather. Each roller rotates in contact with a fixed knife, dragging by its rough surface the fibres of cotton between itself and the knife. Besides these parts there are moving knives, to each of which is attached a grid, or series of fingers. At each elevation of the moving knives, which rise alternately, the grids attached thereto lift the cotton to the elevation of the fixed knife edge and of the exposed surface of the rollers. On the descent of each moving knife the seeds which have been separated from the fiber are disentangled by the prongs of the moving grid passing between those of the lower or fixed grid about 750 times per minute, and are, by this rapidity of action, fluted out.

The turn-out is from 120 to 190 pounds of cleaned cotton per hour. The machine was shown in operation at the Paris Exposition of 1878. It was there stated that 10,000 of the double Macarthy gins were in use in India; and 5,000 of the single Macarthy in Egypt.

The double action knife roller gin is made by Dobson and Barlow, of Bolton, England.

It is entirely self-feeding and self-acting, and the motion for detaching the cotton from the seed differs from that in any other make of gin. The leathern roller is solid, being

composed of round disks of walrus leather with a square shaft through the center. These disks are pressed together mechanically with so much force that when withdrawn from the pressure they form a perfectly solid body. The knife-roller consists of a number of disks fitted obliquely on a wrought iron shaft; it revolves continuously in one direction, the knives gently moving the seeds to and fro while the leathern roller draws the cotton from them until the seeds are perfectly stripped, when they fall unbroken into a receptacle provided for them on one side of the machine, while the cotton is delivered in a continuous fleece at the other side.

When worked at the prescribed speed, a 40" knife-roller gin is capable of ginning the following quantities of seed cotton per hour. —

Dhollerah, 300 lbs.
 Candeish, 333 lbs.
 Madras, 307 lbs.
 Dharwar-American, 230 lbs.
 American uplands, 329 lbs.
 Egyptian, 600 lbs.
 Sea Island, 337 lbs.
 Brazilian K, 460 lbs.
 Tinnevelly Madras, 500 lbs.
 Broach, 348 lbs.
 Native Indian (various),
 820 lbs.

These results were obtained from this knife-roller gin, at the trials in Manchester and India under government auspices. The double-action knife roller gin can be adapted for any kind of cotton by a change of the grid through which the seeds have to fall, and it has the merit of simplicity in construction and adjustment, large turn out of clean cotton uninjured, and having neither crank nor cam motions.

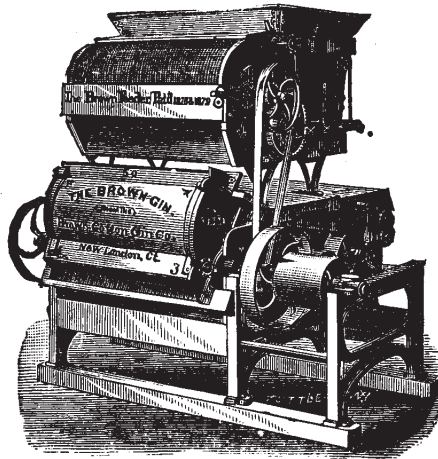
These gins are made of various sizes, with rollers 10" long, to be worked by hand; 20", 30", and 40" wide, to be driven by power.

The cleanness of work, and avoidance of damage to the staple secured by the Macarthy gin, and the large turn out of the saw-gin, are claimed to be united in this knife roller gin.

Fig. 1197 shows the Brown Saw Gin, with feeder and condenser.

The cotton is dumped into the hopper of the feeder, and is taken up by teeth on a revolving drum that runs in the semi-circular front, carried over and dropped into the hopper of the gin upon the saws that are revolving at a speed of 375 revolutions per minute. These saws run between grates or

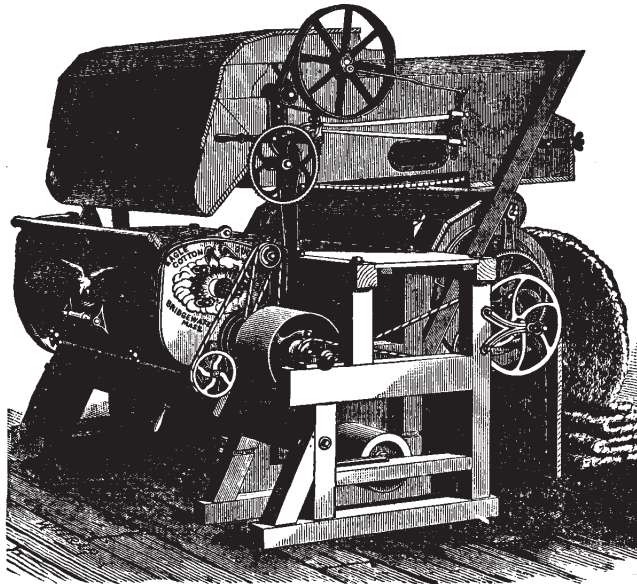
Fig. 1197.



Cotton Gin Feeder and Condenser.

bars that are set say $\frac{1}{4}$ " apart, and pick the cotton from the seed, carrying the lint cotton between the bars, where a brush is revolving at a speed of about 2,400 turns per min-

Fig. 1198.



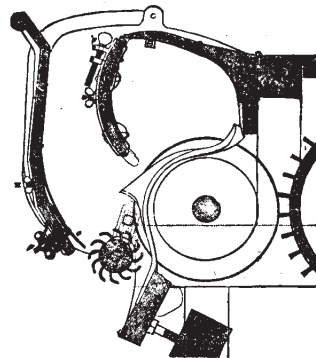
Eclipse Hulling Gin.

ute. This brush wipes the cotton from the teeth of the saws, and it is carried by the current of air (caused by the revolving brush) into the condenser at the rear, when it passes between two wooden rollers and is dropped upon the floor in a pile. The saws number from say 30 to 80 in a gin, the average being about 50.

Fig. 1198 shows the Eclipse Hulling Gin, for working upon cotton gathered with the bolls. It consists of three parts, feeder and breaker, gin, and condenser.

The feeder and breaker, which is the upper member of the complete machine, is used to break the bolls apart before ginning, as well as to feed the gin. It has a strong, rapidly revolving cylinder with blunt points, to bring the cotton to the breast. This runs parallel with another cylinder, moving more slowly, and having wires in it bent backward. Between the two cylinders the cotton is well opened, and all the whole bolls are broken apart, putting them in such condition that the gin will easily discharge them, and at the same time knocking out a large amount of leaf and dirt. This machine picks its cotton on the under side instead of the top, as has heretofore been done.

Fig. 1199.



Eagle Cotton Gin. Sectional View.

The principle of action is described, and several illustrations are given of cotton gins, on p. 969, "Mech. Dic." Fig. 1199 shows a sectional view of the breast, huller, gin-saw, and brush of the "Eagle" Cotton-gin.

The cotton is fed into the outer breast and drops upon the huller roller (*B*), and is carried by it constantly to the saws. The hulls are stopped by the projections from the ribs and the cotton is carried between them and into the inner breast, where it is ginned.

When the gin is fed by hand the inner breast is kept covered with a hinged flap so that the cotton may be pulled over it from the top of the gin. When a feeder is used, as in the perspective view, Fig. 1198, the flap is turned back so as to leave the breast open.

The Clement gin cards from the boll without breaking or tangling the fiber; avoids the separate ginning, and passes the lint from the seed to the condition of thread. Much stress is laid upon the avoiding of twisting and mixing the fiber heterogeneously, and the damage due to pressure in the bale.

The Gullett "Magnolia" Gin claims as a specialty a stationary beater consisting of 6 parallel bars in close proximity to the brush. This beater consists of thin straps of steel, running the whole length of the saws, and to which the cotton is carried, after leaving the saws, and over which it is thoroughly whipped and cleaned of dust and dirt by the brush.

The Scattergood needle-gin has needles instead of saws. The circles of needles consist of 10 segments, each removable for replacement.