

THE ROUND-LAP BALE METHOD OF SHIPPING COTTON.

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The preparation of cotton for the market by what is known as the round-bale process is an industry which practically had its inception during the cotton season of 1896-97, when about 4,000 bales of this kind were shipped from the South. During the season of 1897-98 the number was increased to 70,000, while during the calendar year of 1899 it is estimated that 175,000 bales were prepared by this process.

In the main the plan followed is what is known as the Besonette, invented by an American of this name. The several companies operating in the United States vary but slightly in the mode of forming the bale. What is known as the Standard circular press is in operation in some parts of the Southwest. The press

the total pressure exerted being 7,500 pounds to the bale at the finish. When the roll has reached the required dimensions, the covering, which is suspended in a wooden framework above the press, is released, and descending, is formed mechanically around the bale. The metal ties which have been adjusted to the cover before it enters the machine are fastened by what might be termed metallic fingers. The operator then lets down the front of the press, and the bale, ready for shipment, is rolled out. This press can be operated by 6 horse power when connected directly with a line shaft and will take the product of six cotton gins when operated at its maximum speed.

The Standard press is quite similar in appearance to the one used principally in the Southeastern and Gulf States, which turns out what is known as the American round-lap bale. Like the Standard, it is attached

to the core by a valve connected with a compressed air chamber and cylinder, allowing the pressman to exert whatever pressure is desired upon the exterior of the bale. The air in the chamber is compressed by hydraulic power, varying from 325 to 275 pounds per square inch in the smaller presses, and from 250 to 200 pounds per square inch in the larger size.

The winding continues until the bale is of the proper diameter, when a signal bell is rung automatically and the bat is shifted to the opposite side of the press and a new bale begun. The completed bale is lifted from the bed of the press by the attendants, the core knocked out with a mallet, and its covering stitched on. It is then ready for the market, with the excep-



PLANTATION TEAMS UNLOADING COTTON AT THE PRESS.



COTTON SHIPPED IN THE SQUARE BALE.

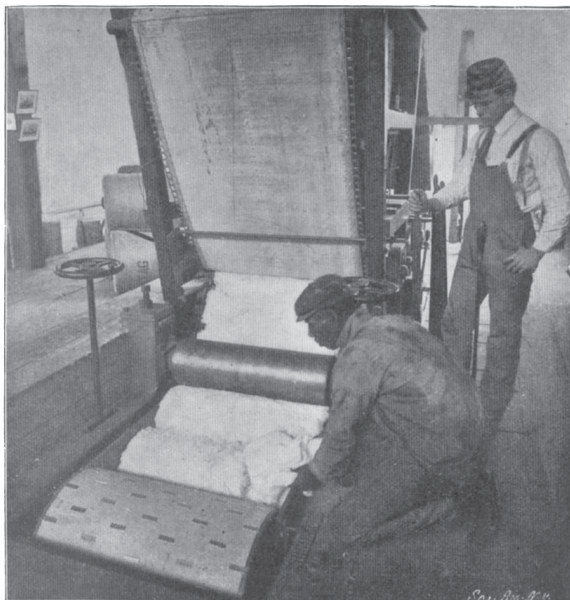
machinery proper weighs 6 tons and occupies a floor space $4\frac{1}{2}$ feet square, with an arm supporting the screw shaft extending laterally about six feet from the press proper. In general a roller-press is operated by the baling-roll and endless-belt process. It is intended to be placed in a ginhouse and about twelve feet distant from the gin or gins. The cotton enters the top of the machine, passing between two belts operated on wooden rolls. The rolls and belts form a figure similar to the upper half of the letter Y, the lower ends of the trough formed by them gradually contracting until but a few inches of space are left for the cotton to pass through. By a movement somewhat similar to the carding machine in a spinning mill it is carried up into the bale former, as it might be termed, which revolves around an adjustable steel core. The endless belt of heavy metallic links, which is 25 feet long and 24 inches wide, operates two steel baling rolls which travel on carriages 7 inches long. These rolls, revolved by the belt, act in connection with the bale former, holding the cotton in place; gradually moving backward on their carriages as the size of the bale increases. As the baling winds around the core, the operator exerts more pressure on the rolls by means of the chain. When the mass of cotton is 10 inches in diameter, the pressure is 13 pounds to the square inch of its surface,

to a condenser and bat former which take the place of the original condenser in the square bale press. The plant is attached directly to a series of from two to six or more gins, the condenser being connected with what is known as the lint flue, delivering the cotton as it comes from the gin to the bat former beneath it. The former comprises two endless aprons mounted in V shape, 2 inches apart at the bottom and 5 feet at the top, their inner surfaces traveling downward. The space between these is closed at both ends by boards, forming a hopper which receives the loose cotton directly from the condenser, converting it into a bat of 10 to 12 inches in thickness and averaging $2\frac{1}{4}$ pounds in weight to the square yard. In a continuous roll the bat passes beneath the first compression roll, which excludes most of the air, while the compressed material is wound around a steel core, which is $2\frac{1}{8}$ inches at the larger end, tapering to $1\frac{1}{8}$, so that it can be easily removed. The core constitutes the temporary center of the bale, which is formed by the revolution of two baling or compression rolls and the baling-belt which passes beneath the rolls and under the bat. The belt acts as a guide in keeping the bat of the proper dimensions, while it also keeps it from sagging down and rolling unevenly. The baling rolls are located $5\frac{1}{2}$ inches apart in this press, so that in the pro-

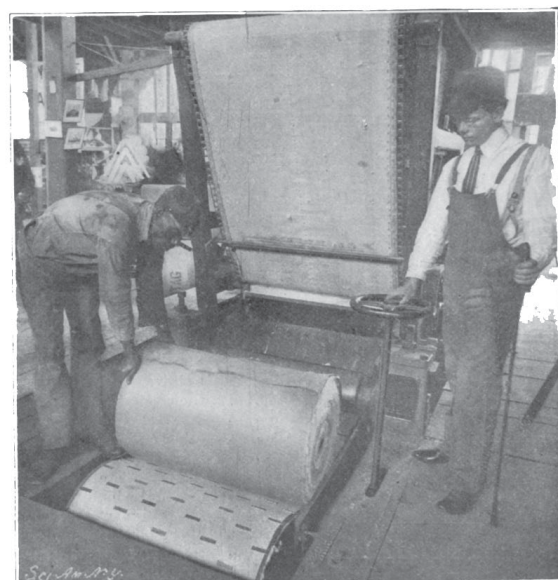
tion of stenciling the weight, the press from which it came, and the address.

The majority of the round-bale presses in use in the South have bale formers on each side, and are so arranged that two bales can be prepared at once, the condenser being large enough to supply the necessary double bat. They are of two sizes, one turning out bales 22 inches in diameter and 35 inches in width, for export demand, and the other 25 inches in diameter and 48 inches in width, for American mills. The time required for the operation varies from 8 to 20 minutes, according to the rate of speed of the machinery. When running at maximum speed, 10 minutes will cover all of the work, including the wrapping and labeling.

A plant established in Weldon, N. C., in 1898, is a fair sample of the presses which are installed in the smaller communities of the South. This consists of a double press with the condenser and bat former connected with four Munger gins, each of 70 saws capacity. The machinery is housed in a wooden building 50 by 25 feet in dimensions and is operated by water power generated from one turbine wheel. The cotton loosely piled on wagons is driven under an open shed from which are suspended suction pipes of tin 12 inches in diameter. Exhaust fans suck the cotton into the gins, which remove the seed and a portion of the dirt and



ROUND-BALE PRESS—COMMENCING A BALE.



ROUND-BALE PRESS—THE FINISHED BALE.

other foreign matter. From the gins the cotton is forced, also by air suction, to the condenser and press, where the bales are completed at the rate of 12 per hour. To operate this plant, 60 horse power is required, of which 35 is taken by the ginning machinery and 25 by the baling machinery. The manual labor required consists of a boy feeder, who merely directs the cotton into the suction pipes, a gin tender for the series of four, one pressman and two attendants, who

per cent in waste space, while the expense of screwing, which is necessary in loading square bales, is done away with, saving from 30 to 40 cents per bale. The internal pressure in making the round bale reduces the quantity of air to such a small amount that it is claimed that the danger from "cotton fires" is reduced to a minimum, thus lowering insurance rates to cotton shipper and vessel owner. The size and form of the round bale allow it to be much more easily carried. As samples are taken of the cotton during the baling process, it is not necessary to open the completed package, as is the case with the square bale, to ascertain the quality, and the loss from the exposure is avoided. Other advantages claimed for the round-lap bale are that it can be fed directly at the mills without the necessity for rehandling, and that on the plantation and in the local market the time and labor necessary to sample, press, and compress it are entirely avoided, as well as the extra expense for metal bands or ties.

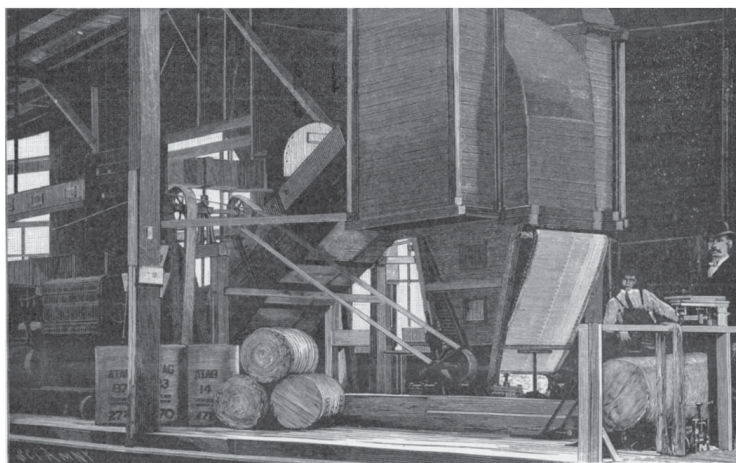
An objection urged against the round bale is that the pressure exerted to each roll is liable to crush the fiber and lessen its value at the mills. It is asserted that carelessness of the pressman may cause too much power to be applied. It has also been urged that grease and oil on the machinery will soil it unless the apparatus is kept properly cleaned, as the lubrication required includes portions of the press which are in proximity to the cotton.



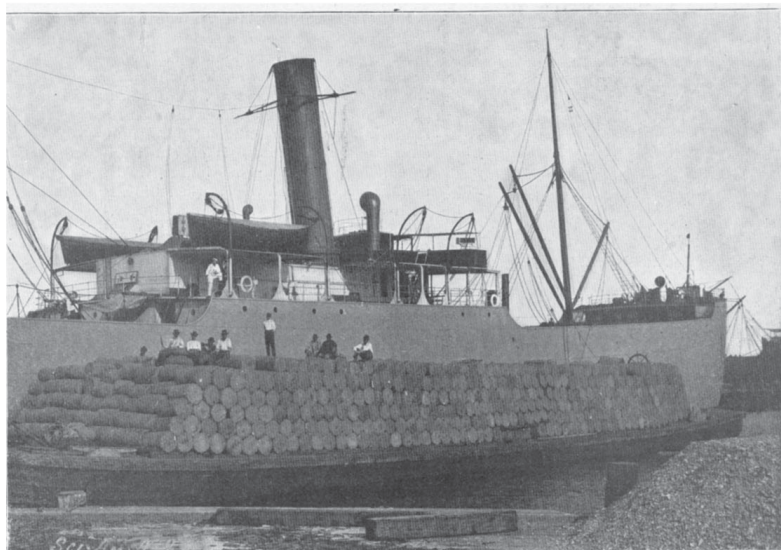
STITCHING THE BALE.

remove the bales from the press and stand by in case a belt should slip or something occur which would require the readjustment of any part of the machinery. In connection with the Weldon press is a cotton-seed oil mill, which converts the seed into liquid, hulls, and meal on the spot. The hydraulic power is applied by means of valves in the usual manner, while the press is controlled by a lever as shown in the illustration.

The advantages claimed for the round-baled cotton are that it economizes space; it is less liable to ignition; it is more readily handled in transportation and at the mill, as the covering is less liable to be damaged and the loss in this respect reduced to a minimum. The density of the American square bale is from 20 to 25 pounds to the cubic foot. A car loaded with square bales 54 inches long, 27 inches wide, and 16 inches in thickness will carry between 24,000 and 25,000 pounds. A cargo of bales pressed but once at the plantation will average about 13,000 pounds. The same size cars loaded with round-bale cotton have carried from 52,000 to 79,256 pounds. A carload containing the greatest weight has recently been received at Galveston, Tex. This is the largest quantity of the staple ever placed in one car. The density in the round bale ranges from 35 to 45 pounds per cubic foot, which is the same density as Egyptian cotton, considered the best square bale in the world. It is calculated that the round bale can be stowed on board vessels with a loss of but 9%



INTERIOR VIEW, SHOWING ROUND-BALE PRESS FED DIRECT FROM THE GINS.



BARGE LOAD OF COTTON IN THE ROUND BALE.