

File Copy

MISSISSIPPI
Agricultural Experiment Station

BULLETIN NO. 7.

HAY PRESSES.

AGRICULTURAL COLLEGE, MISS.

JUNE 20TH, 1889.

File Copy

press fulfill guarantee, the manufacturers agree to return whatever they may have received for the press and refund all freight to purchaser and take press off his hands. If the man sent succeeds in making press fulfill guarantee, the purchaser must pay said man's full expense of going, staying and returning, but no charge will be made against purchaser for said man's time, unless prompt opportunity for testing has not been afforded him. The guarantee of material and workmanship means that should any part fail or break in the legitimate operation of press within one year from shipment, it will be furnished f. o. b. Meridian, free of charge.

Fifteen bales, 100 lbs. average, per hour, is not the usual maximum work of press. The amount that can be done, depending on operators and quality of hay to be pressed. With fine, easily pressed hay, active operators, 25 bales per hour can frequently be reached, and 30 bales per hour sometimes can be done. Also of some hay, 150 lb. bales 3 feet long can be made with ease.

HUNTER PRESS.

Manufactured by Jacob Holberg & Son, Macon, Miss.

Advantages claimed for the J. W. Hunter Hay Press:

- 1st.—Its simplicity and smoothness of action, having no rebound of plunger, causing no jerk or jar on team or press.
- 2d.—Its durability, having fewer and larger bearings.
- 3d.—Convenience of feeding, being able to tramp one charge in hopper on plunger while it is packing previous one, giving more time, less danger, etc., as plunger has a smooth and uniform motion.
- 4th.—In holding hay on smooth sides of bale instead of drawing down top not only requiring much less changing of tensions but also enabling us to have dividing blocks nearer height of feed chamber; causing ends of bales to be smoother.
- 5th.—Its cheapness, costing only \$75 not, or \$100 mounted.

LIGHTNING PRESS.

Manufactured by the Kansas City Hay Press Co., Kansas City, Mo.

We have a FULL CIRCLE SWEEP, which dispenses with the expensive assistance of a driver, a vast improvement over the old, cumbersome, awkward half-circle, which necessitates excessive time and fatigue to team in continually turning back; the full circle making two full strokes of plunger to each round of team.

The lightning Press is made almost entirely of steel, a fact which needs no comment to convince the most credulous of its superiority over the Wooden Press which is at all times susceptible to continuous breaks.

We have adopted a Tucker which laps or folds the hay down in front, making smooth solid bales. The iron Plunger is built with an adjustable top, which prevents it from ever wedging, and any hay that laps over the top is tucked down and helps make the bale compact and even.

We discovered that the power could be materially improved, and by continual experimenting, have adopted a very simple, effective power, which enables us to use a shorter crank and get a longer stroke, our Pitman now travels nearly straight in and out, not swinging out so far as formerly, thus giving the team more ease in crossing the Pitman. By the New Power Device used, the leverage and power steadily increases until, at the last few inches of plunger movement, the power is enormous—the power being so strong that bales of great weight can be made, and is arranged so there is no jerk whatever on the team passing the center, and no pull crossing the Pitman. Desiring further to improve the press, we have lengthened the Feed Hopper six (6) inches, which allows of much larger charges of feed, and as we have greater power than other presses the work is much more rapid. Thus, we have the simplest full circle, as well as the easiest Press on team and men, and the most rapid in its operations. Our improvements have been thoroughly tested, and are giving perfect satisfaction wherever used.

The whole Press is constructed of the best material and in first-class, workmanlike manner.

The steel used in construction of Baling Chamber has a tensile strength of 60,000 lbs., and is the same as used in boilers. It is riveted to the steel angles with red hot rivets.

We have reduced weight of press considerably by using steel plate, where we formerly used cast iron, thereby increasing strength of parts and durability of Press, and reducing draft on team until we have the lightest Draft Press on the market.

The Tying Chamber is made of Steel Angles, so compactly arranged that there is nothing unnecessary or in the way about the Press. For tying purposes, any kind of wire or cord can be used.

The tying and threading can be done from the same side of Press, by one man or boy, without any walking around, as Tying Chamber is made of steel angles, and is only 24 inches high, thereby doing away with passing around Press or employing two men.

The Tension is at extreme end of Press overcoming the friction of the ordinary Press, thereby reducing draft on the team to the minimum, and at the same time giving com-

plete control over the Tension to such an extent that we can make the bale of any desired weight.

The Axles used in Mounted Presses are made of steel. The hind Axle is in crank shape, and is so fastened to Press that it can be lowered to the ground in a second, and raised by a draft team, which is much easier and quicker than by the use of Jack as formerly.

The main Bearings and Pins are of steel, insuring durability and strength. Our Spring Top Plunger enables us to feed hay without doors and the risk of getting the Plunger caught. Owing to the Press being made of steel, the baling of damp hay is accomplished with the same ease as with dry hay; with wooden presses this would be impossible. What little wood we use in building presses any farmer could easily replace, if it should in time rot out.

We have, during the past winter, strengthened our machine in every way. We make the crank with one-third more wearing surface and in every other point where our machine has shown a weakness by severe usage we have strengthened it, thus insuring double strength in all parts.

In baling wool, cotton, hair or other material to be packed into burlaps, the sack can easily be slipped over Angle Irons, and receive bale, and all there remains to be done is to sew up sack.

HAMILTON PRESS.

Manufactured by Southern Standard Press Co., Meridian, Miss.

(The manufacturers of this press promised to send a full description, but none has yet been received, and it was thought best to delay the publication of the report no longer.—S. M. T.)

Before beginning the contest, the following rules were agreed upon for the guidance of the work.

Each press must bale at least one thousand pounds of hay per hour, but before time is called for any press to begin work the exhibitor will be allowed to use as much time and to make as many bales as he may desire, to get his press in good working order.

The average weight of bales in any contest must be not less than fifteen pounds per cubic foot, and no additional credit will be given for a weight exceeding twenty-five pounds per cubic foot.

In grading density of bale, any press making a bale which weighs twenty five pounds per cubic foot will receive a credit of the maximum grade, 30 points, and a press making a bale weighing fifteen pounds per cubic foot will receive a credit of one point. If the weight per cubic foot is between these two figures a proportional credit will be given. Credits for other points of contest will be judged in a similar manner.

Any press failing to make a speed of at least one thousand pounds per hour, and a density of at least fifteen pounds per cubic foot will receive no credits on these points.

One thousand pounds of hay will be furnished to each press for each trial, but any press which may desire it shall be allowed a second trial on the same conditions as

the first trial, and will receive a final credit consisting of the average results of the two trials.

Weight per cubic foot will be ascertained by measuring and weighing bales after they are taken from the press.

In making the test for portability the Director may, at any time during the trial, give an order for a move. When this order is given to any press the press will stop work at once, pull up, hitch on a team, and reset at such point as may be directed, and begin work again. Time will be counted against each press from the time the order to stop work is given until the press is ready for work after resetting. In order to show that it is ready for work each press must complete a bale in its new position before time will be counted.

A second test for portability may be made in a similar manner, except that the press may be directed to make a haul over rough or plowed ground.

In making the tests for portability, after the order for moving is given no change can be made in the tension of any press.

Each press will be allowed to make separate trials with one and with two horses, and separate records will be made of each trial.

Presses will be graded on a scale of 85 points, divided as follows:

Weight per cubic foot of bale.....	30
Speed	25
Horsepower	15
Appearance of finished bale.....	5
General opinion of the judges.....	10

85

In the "Opinion of the Judges" was included the general work of the press and many other points which enter into its value, which were not covered by the other points in grading, but did not include a consideration of either price or durability.

Prof. J. H. Connell, Professor of Agriculture and Superintendent of the Agricultural College Farm, Mr. J. C. Rand, an extensive hay grower of Oktibbeha County, and S. M. Tracy, Director of the Agricultural Experiment Station, were appointed to act as judges, and W. L. McGee,

Assistant Director of the Experiment Station, was selected to weigh and measure the bales. The weighing was done on a Fairbanks scales and the measuring done by a caliper rule with arms nine inches in length and placed at right angles to the body of the rule. Each bale was measured in two places in each direction, and the average of the two measurements made the record.

The density of each bale was ascertained separately by dividing the weight by the number of cubic feet, and the grade for density was reached by giving a credit of three points for each pound above fifteen per cubic foot of bale.

The grade for speed was made by using the best speed made (1000 pounds in 18 minutes) as a standard, and one hour as the extreme limit of time.

In this way, the grades for density and speed are simply matters of record, while the "horse power," "appearance," and "opinion" are matters of judgment.

During the contest, each press was required to pull up, make a short move, and reset, as a test of portability, but as there was practically no difference in the time required for this by the Mississippi presses, by mutual consent, no grading was made on portability. The Mississippi presses were all mounted on wheels of very nearly the same diameter, and could be moved over any ordinary ground with a single team. The Lightning Press is much longer than any of the others, being nineteen feet between axles and only ten inches from the ground, so that it is difficult to turn in a narrow place, and the weight of the press is too great to permit it to be hauled over plowed ground without the use of four mules.

The hay used in the work with one mule was clover with a small mixture of grass, which had been in the barn about a month, and was sufficiently damp to pack easily, while the hay used for the two mule contest was a rather poor quality of Johnson grass which had been in the barn for about nine months.

At the close of the contest, each press was weighed, and

the selling price of each given by the manufacturer, as follows:

Press.	Weight. lbs.	Price.
Ideal.....	2620	\$185.00
Hunter.....	2625	100.00
Hamilton.....	2544	185.00
Lightning.....	3275	310.00

After setting and making as many preliminary bales as were necessary to see that the presses were in good running order, the "Ideal" was the first to announce itself as being ready for the test. One thousand pounds of clover hay was weighed out to it, and time counted from the time the order for starting was given until the block was pressed back against the last of the hay.

In the opinion of the judges, the work done by this press was easier on the mule than was that of any other press, as the pull in no case caused the mule to stop walking, and the rebound of the traverser was taken in such a way that the lever and singletree did not strike the legs of the mule, as they did with most of the others. The bales made were excellent in appearance, being quite smooth on the sides, and usually so on the ends. The density of the tops and bottoms was very nearly even and the bales more nearly regular in form than were those from either of the other presses. In none of its three contesting runs was the "Ideal" obliged to stop the mules for any cause, excepting once to adjust the harness which had become loosened.

The other two runs made by this press will be mentioned in their proper order.

The "Lightning" was the second press to be ready for work, and was furnished the same amount of hay of the same quality as that given the "Ideal." Its work was completed in a shorter time than was required by any other press, and the bales made were more dense than those made in the previous trial. Only eighteen minutes were required for the work, but it was so hard that no mule could have endured it for any great length of time. Very frequently the heavy mule used was obliged to make several efforts before it could force the traverser back, and the rebound threw the lever and singletree against its legs

with considerable violence. In the opinion of the judges, this press cannot be worked profitably with one mule, and ought not to have been permitted to enter this part of the contest. In the setting of this press, the body is let down so as to rest on the ground, which saves a little labor in pitching the hay, but is inconvenient for tying, and makes it necessary to remove each bale as soon as it is free from the press. The traverser failed to rebound properly and had often to be pushed back by hand, a defect which was afterwards remedied by setting the press in a different position.

In the table giving the final results, the two grades of 0 given to this press refer to its value for use with one mule only, and not to its fitness for work with two.

The "Hamilton" pressed the same amount and quality of hay as did the others. The power required, though not more than two mules could furnish by changing, was decidedly more than was needed with the first press used, and a much longer time was required for the completion of the work. The bales made were very heavy, weighing over twenty pounds to the cubic foot, and quite smooth, but were somewhat curved on account of their being more dense near the bottom than at the top, a defect which would make the bales pack loosely in a car and render them more liable to break open in handling.

The managers of the "Ideal," believing they had worked at some disadvantage in being placed first on the list of contestants, claimed a second trial, in which they made quicker time and a denser bale than did any other press with the use of one mule. When speed and density were both increased, of course more power was required. Although this test was run through with a moderate sized mule which did not seem overstrained, the judges were of the opinion that such a rate of work could hardly have been continued through the day, even by using two mules interchangeably.

The managers of the "Hunter" press were unfortunately delayed by a railroad accident and didn't arrive in time for this part of the contest.

TWO-MULE TESTS.

In making trials of presses with two mules, the stiff Johnson grass which was used materially lessened the density of the bales. The clover used previously was so damp that it was comparatively easy to make a heavy bale, while the Johnson grass was selected for the last trial because it is the most difficult to bale of any of our Southern grasses.

The "Hamilton" was the first press called to work, but owing to a mistake in the making of the traverser sent with the press, was obliged to stop when only two bales had been completed.

The "Ideal" changed its lever, using one 12 feet 3 inches long in the place of one 15 feet long which had been used in the previous trials. Its speed was about the same as in the previous trials, and the bales much lighter, though more dense than those made by any other press. In appearance they were as good as could be expected from the quality of the hay, but were not as smooth as those made from clover.

The "Hunter" was called next and completed its work in thirty-nine minutes, with an average density of 18.23 pounds per cubic foot of bale. The work seemed hard for the mules, which had occasionally to make a second attempt before the traverser could be forced back, and several of the bales were uneven in appearance. In this press, the traverser is drawn back from the charge by the team, so there could be no trouble from the rebound. The press is much lower in price than any of those present, and the character of its work was all that is necessary for the farmer who has only a moderate amount of hay to bale.

The "Lightning" was the last to be called and completed its work in less time than did either of the others, using only nineteen minutes and securing a density of 15.47 pounds per cubic foot. The bales were good, but not quite so smooth as those from one of the other presses. The team did not seem overworked, and the rebound acted fully.

The representative of this press made a protest against

the division of points in grading, claiming that the horsepower required should not be charged with more than ten points, and that at least five points more should have been given to speed.

Full details and the grading of each trial are given in the following table:

Number of test in order, as run.	Name of press.	Mules used.	Kind and amount of hay pressed.	Time consumed, in minutes.	Weight per cubic foot of bales. (Density.)	Grading, as per scale of points adopted.					Total.
						Speed.	Density.	Strain on team.	Appearance of bale.	Opinion of judges.	
First	Ideal	1	1000 lbs clover	23.0	18.86	22.00	11.58	15.00	5.00	10.00	63.58
Fourth	Ideal	1	1000 lbs clover	19.0	21.97	24.40	20.91	12.50	5.00	10.00	72.81
	Average			21.0	20.41	23.20	16.24	13.75	5.00	10.00	68.19
Second	Lightning	1	1000 lbs clover	18.0	19.72	25.00	14.16	4.50	43.66
Third	Hamilton	1	1000 lbs clover	44.0	20.36	9.57	16.08	12.50	2.50	5.00	45.65
Fifth	Ideal	2	1000 lbs Johnson grass	22.5	18.76	22.08	11.23	15.00	5.00	10.00	63.36
Sixth	Lightning	2	1000 lbs Johnson grass	19.0	15.46	24.40	1.38	14.00	4.50	10.00	54.28
Seventh	Hunter	2	1000 lbs Johnson grass	39.0	18.23	12.50	9.69	10.00	3.50	7.00	42.69

It was urged by several that in grading the presses attention should be given to price and durability, but as the list prices of each are given there seemed no necessity for grading on such a point, and the judges did not think that any reliable estimate of comparative durability could be made from seeing a press work for a few hours only, so neither of these were considered.

A car eight feet wide, seven feet high, and thirty three feet in length contains 1848 cubic feet. Twelve tons of hay, baled with a density of 15.47 pounds per foot, will occupy 1551 cubic feet, leaving 297 cubic feet, or 16 per cent. of the available space unoccupied. If baled with the greatest density secured during the contest, 21.97

pounds per cubic foot, it would occupy only 1092 cubic feet, leaving 756 cubic feet, or nearly 41 per cent. of the space unoccupied. The space occupied in the car is of vital importance to the shipper as freight costs no more on a car holding twelve tons than on a car holding only nine or ten tons, and the amount of freight paid is just so much out of the price received by the shipper. No shipper can afford to buy at any price, or even to use a press which will not give a density of at least fifteen pounds per foot. For the hay grower who expects to sell his crop in a local market, or who bales for convenience in storing, such density is of less importance, while speed and cost should be more carefully considered.

S. M. TRACY,
DIRECTOR.

