Apple Mills and Cider Presses

Jonathan S. Buell, 1874

Selected pages from The Cider Makers? Manual.

Historical mill and press drawings show how apples were crushed, arranged in layers and pressed for juice.

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be made available if desired. On the other hand, we make the suggestion that each and every owner of a cider or wine mill engaged in the manufacture of cider, champagne or vinegar, should endeavor to possess one or more apple orchards, in view of the various advantages derivable from such an arrangement.

CHAPTER II.

The Cider or Wine Mill; its early history.—The English Cider Mill.—The Nut Mill, and how constructed.—The Grater Mill.—Hickock's Portable Mill.—Existing defects in the construction of Graters and Crushers.—Improvements therein.—Buell's Combined Grater and Apple Crusher.—The Cider Press.—Construction of Cider Presses.—The Wooden Screw.—Iron Screw.—Operating Screw Presses by machine power.—Gearing and Levers.—Buell's Improved Screw-press.—The Press Curb; how constructed.—Laying the Cheese.—Use of straw ignored.—Cloths and frames recommended.—Frames; how constructed.—Seed-Washers, &c.—The Hoisting Machine.—The Force Pump.—The Model Cider Mill, and how constructed.—Buell's Portable Wine and Cider Mill, etc.

The primitive mills used in the manufacture of cider, involved no expensive outlay for buildings. The limited quantities made, enabled the work to be accomplished during favorable weather, and recourse was naturally had to the orchard, as being the more convenient place.

The earliest appliance known, which in this day of improvement has become obsolete, and which would require an extremely fertile imagination to designate a mill, was simply a trough, in which the apples were reduced to an imperfect pomace by rolling them with a heavy cylindrical stone, or by pounding them as in a mortar.

An improvement was the production of the English cider mill. This consisted of a pair of coarsely corrugated iron cylinders, from which the apples fell to a second pair, close together and finer in their surfaces, and passed through finely mashed to the pomace vessel underneath.

The principal mill in the United States succeeding the trough just mentioned, and the one generally used until within a few years, was known as the nut mill. It consisted of a pair of upright log cylinders, 16 to 20 inches in diameter, properly adjusted for revolution, and close together in a strong frame work. At the upper end of one of these cylinders was affixed a strong lever, which extended to the horse circuit, where the proper power was applied. Upon the surface of one of these wooden cylinders were two or three lines of cog-like projections spirally arranged, which served the double purpose of clutching in the apples and turning the other cylinder by means of properly formed cavities mortised into its circumference. The machine was completed with the addition of a box or hopper arranged to receive the apples, and to conduct them to the cylinders, where they were subjected to a thorough mashing. The next improvement, and which at the time of its introduction created considerable public interest on account of its simplicity and novelty, was the grater mill, which first became known about the year 1825, and is said to have been invented in the western part of the State of New York. This mill consisted of a horizontal cylinder some 10 or 12 inches in diameter and about the same length, which was armed with numerous short spikes, and revolved at a high velocity under a concave similarly spiked, so that the apples in passing between

these surfaces were subjected to a grating rather than to a crushing process, as in the machine previously described. In 1852 Mr. W. O. Hickock, of Harrisburg, Pennsylvania, invented a portable cider mill, which consisted of a pair of small horizontal cylinders, armed with small spirally arranged teeth or spikes, revolving close together, one at a higher velocity than the other. The apples were first broken by the action of a coarsely fluted roller, which revolved against a table under the hopper, and after passing between the cylinders, the apples were not only bruised but also grated into the required pomace. This machine was capable of grinding one hundred bushels of apples per day. It occupied only the space of a few feet, and was easily transported on a light wagon from one neighborhood to another, as might be desired. This mill was for a time in high repute, and the inventor was enabled to sell as many as a thousand of them during one season. Since that time numerous modifications have been made in the plan of Mr. Hickock's mill, some being simply spiked cylinders, against which the apples were carried and held till grated by reciprocating plungers. A great variety of designs, intended to be operated by hand-power, for family use and making cider in a small way, are being extensively manufactured and offered for sale by most American agricultural implement makers and dealers throughout the country.

Our limits will not permit us to notice all the various styles of portable mills before the public, or the multitude of graters or apple grinders, many of which possess excellent points and are worthy of commendation. As a general rule, however, the great majority of these implements for cider making are deficient in

the essential principles necessary to a perfect machine. In the first place, where rapidity of action is necessary, all of these machines require correspondingly greater motive power, which involves additional expense, and the power requisite for one of the small machines would be sufficient to drive a mill capable of accomplishing ten times the amount of work. In the second place, in order to be profitable, it is necessary that the mill should be so constructed as to obtain the greatest amount of apple juice possible from any given quantity of apples; and this, aside from the pressing necessary, can only be accomplished by a thorough breaking of the cellular tissues of the apple. These cells are extremely small and numerous, and the apple must be reduced to an impalpable pulp in order that all the juice may be extracted. The majority of machines do this work very imperfectly. The great objection to them arises from the fact that they have been so constructed as to cut the apple into shot-like particles or cubes, which contain in their cellular tissues a considerable portion of the apple juice, and are not subsequently broken when placed in a mass under the heaviest pressure. This difficulty can be partially overcome by the chemical action of the atmosphere upon the mass, which has a tendency to decompose these small particles or cubes, thereby separating the wooden fibre of the apple and allowing the liquid held in combination to escape. But this operation requires time, and is objectionable in many other respects, particularly so for wine-making, as the oxidizing effects of the atmosphere increases or heightens the color of the extracted liquor. Many practical cider-makers, however, adopt that course, and allow the pomace to lie from 24

to 48 hours before pressing, in order, as they claim, to heighten the color, but really for the purpose of securing a larger quantity of cider. A greater quantity might be realized just as well in the first instance, and without the objectionable oxidation, if a proper mill for preparing the pulp were used.

Some manufacturers of grater mills or apple grinders substitute knives or blades, which are affixed to the revolving cylinder, and instead of cutting the apple into the small cubes before referred to, scrape the apple to an impalpable pulp. As a general practice this plan is best. No difficulty, however, exists in accomplishing the same result with the grater mill when properly constructed. The teeth or spikes, which are made expressly for that purpose, with a chisel head (as shown in the engraving, fig. 1, which represents the full size, and may be obtained at most of the principal hardware establishments at a small advance over the cost of ordinary nails), should be driven closely together in lines diagonally over the face of the cylinder, and not projecting much if any over an eighth of an inch. The spikes when so arranged form a cutting or scraping surface similar to the blades ordinarily used, and by many are regarded as far superior. They possess the great advantage of being easily replaced when broken out by stones or other hard substances, and thus repeated until the staves of the cylinder require to be replaced by new ones. The engraved section of a cylinder stave (see fig. 2) indicates the manner of placing the teeth or spikes, which



Fig. 1.

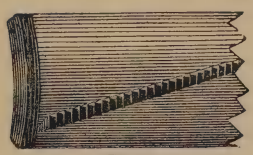

Fig. 2.

may be inserted in a uniform manner with a hammer and a setting tool, in which the head of the spike is held while being driven the required depth.

Much discussion has arisen from time to time among practical cider-makers as to the superiority of graters over crushing mills and *vice versa*. We cannot undertake to recite the arguments, but this much we can say, that the ideas thus eliminated have frequently been valuable and suggestive. Those who advocate crushers claim that their tendency is to break the cellular tissues of the apple, and thereby allow all of the fluid it contains to pass off freely under the press. This has been found by experience not to be the case. The numerous infinitesimal cells of the apple cannot be broken by any crushing process alone, and at the same time effectually break the fibres or cases of all the cells so as to permit the free escape of the juice of the apple when under pressure. And unless thus effectually torn asunder their tendency is to restrain and hold as it were in a sack much that otherwise would escape. A partial decomposition of the fibre, however, previous to being subjected to the action of the press, greatly facilitates the operation and becomes essential in order to extract the juices of the apple in all cases where it has been crushed or coarsely grated by imperfect machines. Yet this decomposition, besides the oxidizing effects before mentioned, engenders fermentation, and the cider resulting from such a process cannot be regarded favorably for wine manufacture, but may be appropriately used for vinegar purposes, as will be seen in a subsequent chapter.

Grater mills have a decided advantage in other respects over crushers, and among these may be mention-

ed the peculiarity of their construction, enabling them to eject small stones and other hard substances. If this could be successfully accomplished with crushers, and the pulp afterwards pulverized with a grinder, such a mill would probably be the best that could possibly be constructed, as it would be both profitable and economical.

The nearest approach to anything of this kind is a grater or grinder combined with a crusher, known as

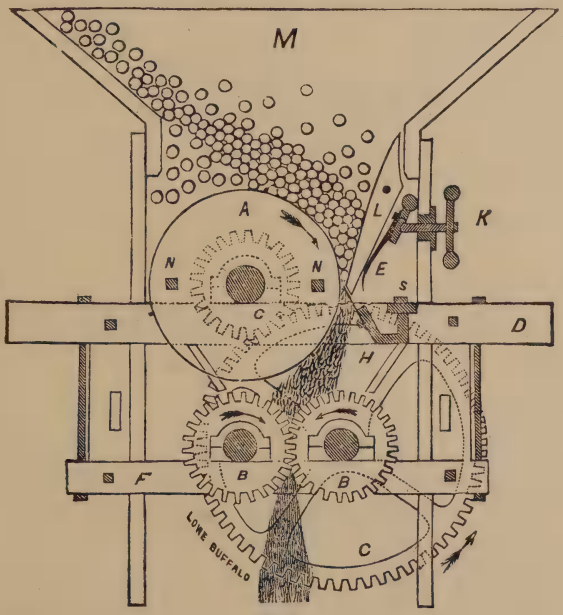

Fig. 3.

"Buell's Combined Grater and Apple Crusher." It occupies but a little space, and is so unique in its construction that a detailed description may not be out of place. The accompanying illustration will serve with

the description given to explain its construction and mode of operation.

Attached to the frame "D," (see fig. 3,) made for the support of the revolving cylinder, is another similar frame "F" underneath, at the proper distance to admit and sustain crusher rollers "B, B." These are placed below the cutting or grating cylinder "A," and are driven by gear wheels "C, C," which are affixed upon the opposite ends of the shafts from the gear wheels "B, B," the latter having a much less velocity than the grating cylinder "A." The crushing rollers "B, B," are made of cast iron, and are about six inches in diameter, and so arranged that the pomace as it falls from the grater "A," will pass between the crushers "B, B," and thence into the proper receptacle. The cylinder "A" may have knives or grater spikes, or both, upon its circumference. The heads of the cylinders are also of cast iron, and so arranged that they form with the iron rods which pass through the cylinder lengthwise clamps to hold the wooden staves in position. By loosening the nuts attached to the rods "N, N," the staves of the cylinder "A" may be removed and replaced by others, being only the work of a few minutes. Upon the frame "D," and placed below the center of the cylinder shaft and on a line therewith, is a cutting bar "H," made of cast iron, which is adjusted by a set screw "S" at any required distance from the face of the cylinder "A." Attached to the face of this cutting bar by bolts. is a thin steel blade, the upper edge of which is parallel with the center of the cylinder shaft. Near the top of the cylinder box and under the hopper is a thin cast iron bar some four inches wide, hung by circular projections extending from the ends

near the top, and fitted to proper bearings, so as to enable it when not fastened by the hand screw "K" to swing freely. Attached to this bar, and firmly bolted thereto, are several flat steel springs "E," about one and a half inches wide, which extend down and are brought to bear against pieces of wood "L," of corresponding width. These latter, which are pressed against the back side of the steel blade attached to the cutting bar "H," are held in position by a half-inch iron rod at the top, and are free to move backward against the yielding springs when small stones and other hard substances are driven out. The hand screw "K" is used to tighten or stiffen the force of the springs, and regulate their action as may be desired. The cylinder "A" is about 12 inches long and 10 inches in diameter. The apples are supplied through the hopper in the usual manner, and should a stone be accidentally introduced, one or more springs yield sufficiently to eject it, and no injury follows with the exception, perhaps, of a few broken spikes, which are easily replaced.

With the exception of the crusher rollers "B, B," gear wheels "C, C," and frame "F," the foregoing fully describes Buell & Brother's imperial grater, introduced during the Fall of 1868. They also manufacture other kinds of graters, but those of which a full description has been given are the best.

THE CIDER PRESS.

Of all the machinery connected with the cider mill, the cider press is regarded as the most important auxiliary to the business of cider-making. Devices which relate to the reduction of the apple to an impalpable pulp have received much attention, and a high state

of perfection has already been attained. It is fair to presume that little opportunity is left for any further improvement in that direction. More attention therefore has of late been devoted to the cider press, as since the introduction of graters for grinding the apples, the heavy and laborious work in a cider mill has been principally confined to the cider press. Before the introduction of screws, the method of extracting the juice of the apple was by the use of heavy weights, wedges and leverage. Until within a late period a large wooden screw was used, and even now in some sections of the country is still in use. Of these screws, two, and oftentimes three and four, set in a strong frame work of double timbers, were found no more than sufficient to separate the cider from the pomace. In order to operate these screws a long heavy wooden lever became necessary, which required the united services of four or five men to handle, and not unfrequently the strength of a yoke of oxen was called into requisition before the work could be accomplished.

An improvement upon the wooden screw was made by the substitution of the iron screw and iron nut, which was found to answer all purposes so much better than was at first anticipated that the iron screw has almost entirely done away with the old style of wooden screws. There is still the objectionable feature of having to handle heavy and cumbersome levers, making the labor irksome as well as expensive.

For the purpose of overcoming this difficulty, several devices have been tried, as, for instance, toothed wheels operated by gearing, and by similar appliances for turning the nuts instead of the screws. But all have been tried with indifferent success, and not unfrequent-

ly under a heavy pressure some portion of the gearing would break, and those using such appliances would be compelled to return to the use of the lever, the method now generally prevailing. In the Fall of 1867, the inventors of the grater before particularly described conceived the idea of operating screw presses with a lever by the means of water power. They fitted up a press containing a heavy iron screw, which was successfully operated during that and a portion of the following season, when the press frame, becoming somewhat decayed, gave away. The same was replaced with a new frame and two smaller screws, operated in like manner, which continued to work throughout the balance of the season with the most satisfactory results. For their improvement in the mode of construction and operating screw presses, Letters Patent were granted them on the 24th of November, 1868. A considerable number of these improved screw presses have been sold through out the country, giving entire satisfaction in every instance to the purchasers and to all who have witnessed their operation.

The subjoined engraving represents a press with two screws, as operated by water or any machine power, also the mode of attaching the lever to the screw. Upon the head or end of the screw (see letter "A" in the engraving,) is a ratchet wheel some ten inches in diameter, firmly fixed with keys thereto; and immediately under, encircling the screw and a portion of the ratchet wheel, is a casting (see letter "D") forming a portion of the lever. Upon this casting and held in position by a strong bolt is another movable casting, (see letter "B") which operates upon a bolt as its fulcrum, and is known as a double or right and left hand dog or

pawl, with a projecting handle to place it in position. Within a box or aperture in the casting, over which the handle of the pawl projects, is a slide (see letter "C") of a V shape projecting from the aperture, which is pressed against the side of the dog or pawl by a spiral spring, and holds the same in position.

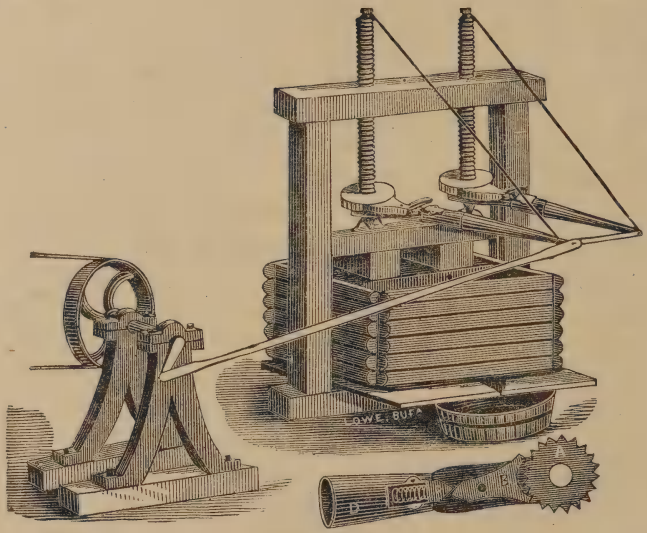

Fig. 4

The lever is held in a horizontal position by an iron brace connecting the extreme end of the lever with the top of the screw, so that the lever and iron brace rise and descend with the upward and downward motion of the screw. By placing the pawl in position, and giving a forward and backward motion to the lever through a connecting rod attached to a crank and shaft, the screw is made to operate as may be desired.

The power is applied with equal facility, regardless

of the position of the screw, whether it be high or low, as the lever is firmly fixed at one end to, and movable upon the head of the screw, while at the other extreme end of the lever, all the force is applied, and by a simple and ingenious arrangement, regardless of the direction of motion, the screw is raised or lowered, as may be desired, by simply turning the handle of the pawl to the right or left.

The follower is fastened to the screw and passes up and down with it, thereby avoiding much heavy and unnecessary labor. These attachments are susceptible of being fitted to any number of screws, and all operated by one driving-wheel, and at the same time all of the screws made to work separately or together

The press frame, (see fig. 5) may be constructed in the ordinary manner, the sill and press beam being from 16 to 20 inches square, according to the size of the screw intended to be used. The upright posts should be of sufficient length to allow a space of at least seven and a half feet in the clear between the sill "S" and the beam "B." The timber for the posts "P P" should be ten by sixteen inches, and the distance between the posts "P P" seven feet. There should be two tenons on each end of the sill "S," and beam "B," and each three inches wide by seventeen inches long. This length is given, as it will permit keys to be used through the tenons outside of the posts, instead of wooden pins, as shown in fig. 5. The posts should extend some distance below the bottom of the sill "S," also above the upper surface of the beam "B," and the whole strongly bolted with iron rods of not less than one and a half inches in diameter, with heavy heads and nuts, as shown in the engraving.

The screws should be placed two and a half feet apart. The platform, made of three-inch pine plank, should also be seven feet square, properly grooved upon the outer edges, with suitable conduits for the cider to run from the cheese to the intended receptacle.

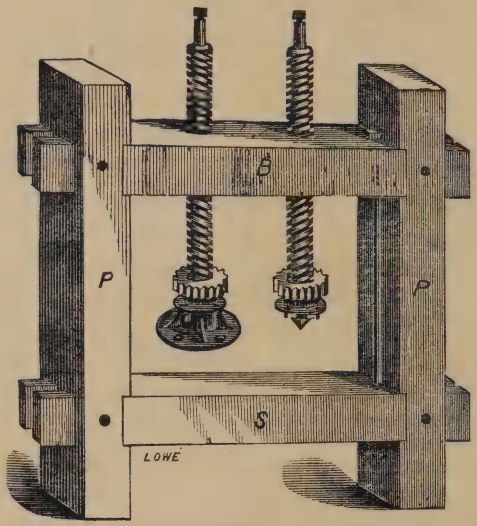

Fig. 5.

Some, construct their press frames with uprights of thr e, four and six-inch plank, and in the following manner:

Two bed pieces of timber, "B B," (fig. 6), ten by sixteen inches, are laid about ten inches apart upon a substantial foundation. Upon these timbers, across the ends, a short plank "D," four inches in thickness, is placed, and two other planks "E," each also four inches in thickness, seven feet four inches in length, and of convenient width to form posts, are placed upright,

with the lower end of each resting upon the short planks "D," as shown in the engraving (which represents a section of the press frame.)

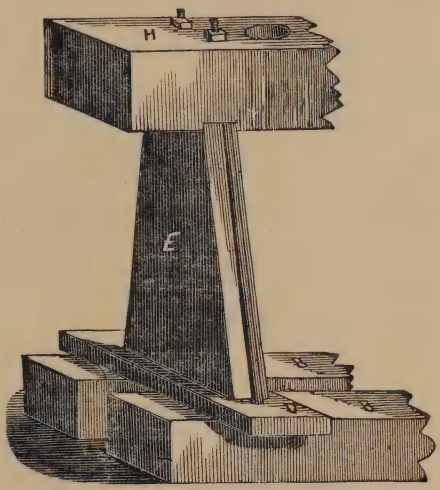

Fig. 6.

Upon the upper ends of the planks "E" (used for posts) the timber for the press beam "H" also rests, the planks "E" fitting into a shoulder cut into the press beam "H" to the depth of two inches. The whole is securely bolted together by four iron rods, each about two inches in diameter, which extend through the bed pieces "B B," at an angle, along the edges of the upright planks or posts "E," and through the press beam "H."

This mode of construction makes a cheap substantial press frame, and requires but little time or labor to build it. The main points to be considered in the construction of all press frames, are durability, firmness

and strength. These being accomplished it becomes a matter of little importance how it has been done.

The levers used to operate the screws as represented in the engraving of fig. 4, may be of any length. For convenience, they are at present made partly of iron and of wood. The usual length, ranges from seven to eight feet from the center of the screw, to the extreme end where the power is applied. The arm or pitman connecting the crank with the end of the lever may also be of any length, ten feet or more, according to circumstances. The length of the crank, is governed in all cases by the length of the lever, and is so made as to be adjustable thereto. The band wheel of the crank shaft, ordinarily, is double or twice the diameter or length of the crank. The velocity or motion of the band wheel should range from forty to sixty revolutions per minute, never exceeding the latter under any circumstances, and may be as much less as desired. Every revolution of the band wheel, revolves each screw attached to the crank, one-thirty second part of its circumference, that is thirty-two revolutions of the band wheel, revolve each screw attached to the crank only once. The multiple of power, derived under this arrangement obviates the necessity of any great length of lever, while the power necessary to operate the screw is about one-fourth of that ordinarily required to grind the apples. Two screws may be operated at the same time, with the same power as would be required for one screw, which is done by equalizing the power and having it uniform at all times upon the levers. We therefore, where two screws are to be used in a press, usually select what are called "pairs," right and left hand screws. These screws being alike in other re-

spects, are placed in such a manner that when the levers are attached, in order to run the screws down, they will swing at their ends, towards each other or together. The ends of the levers being then united by an iron or wooden strip, (sufficient space in the orifices being allowed at the ends of the levers for the angular movement), and the arm or pitman which connects the crank with the end of one of the levers, as the force is applied will alternate the screws, upon which the respective levers act, thereby securing regularity of motion.

Thus one press after another might be connected, by allowing sufficient space, between each, for length of pitman, and by having the screws in a line, the levers to all of the presses would oscillate as the necessary force was applied. If there were six presses in a line, in some, the screws might be stationary, that is, not operating, in the others they might be running up, and still in others down. This would all be regulated, by the position of the dog or pawl of the lever. If placed on the center, no motion would be imparted to the screw, if turned to the right or left, the screw would operate correspondingly.

In some cider mills, the presses are arranged so as to be opposite or facing. In such cases, the ends of the levers may project to within two inches of their opposites, while the crank of the band wheel shaft should be placed in line with the center, between the extreme ends of the levers, thereby permitting the arm or pitman, which connects the lever with the crank, to be changed from one side to the other, alternating, with the presses operated.

Where the machinery is operated by water power, a continued pressure can be maintained during the night

upon a large cheese, by leaving water enough upon the wheel, to start the machinery every time, or as often, as the cheese yields sufficiently to permit it.



Fig. 7.

The proper length for an ordinary screw (see fig. 7) is four feet and six inches. The thread should be cut three feet and ten inches. The spindle at the upper end, to hold the brace may be of any length to accommodate the screw to the thickness of the press beam, and sustain the brace which supports the lever. This spindle may be inserted in the end of the screw and fitted tight, or the brace may be made with an elbow, and one end, loosely fitted into the end of the screw, so as to revolve therein, while the other end of the brace should be firmly fastened to the lever.

Screws, of four and four and a half inches in diameter are the best (although three and a half are much used), and wrought iron screws, are preferable to cast iron. The latter, however, are less expensive, and can be made cheaply if cast hollow, thereby saving the weight of the iron, and not materially affecting their strength.

The nut through which the screw passes should be at least ten inches long, so that the bearing of the screw under a heavy pressure will be equally distributed upon the threads, thereby preventing a twisting or breakage of the same, also ruining the screw or nut. The thickness of the nut, including the thread, at its upper end, need not be over one and one-quarter inches, and at the shank, one and one-half inches, while the

flange should be two and one-half inches wide, by one inch in thickness. The nut should be inserted in the beam perpendicularly, and fitted with exact nicety. The bearing should be upon the end, and not wholly upon the flange, and it should be securely fixed to the beam in such a manner as to prevent any movement whatever.

The curb frame of the press, (fig. 8) should be a permanent fixture, and securely braced at its sides and ends. The frame can be made of scantling, of about four and a half to five inches square, halved together at the ends. The slats, made of one and one-quarter inch, hard-wood plank, by two and one-half inches wide, should be three and a half feet long, and firmly spiked to the frame in an upright manner.

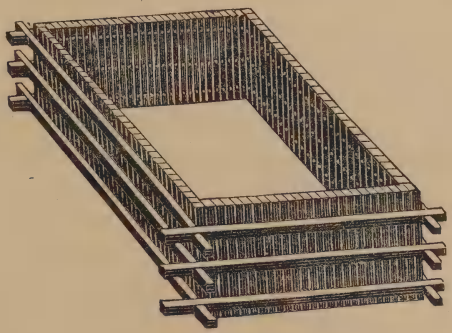

Fig. 8.

The curb frame, should be made in sections, sides and ends, and then, put together upon the platform of the press, where the sides and one end, should be securely fastened. This would leave the other end free, to be used as occasion might require.

In laying the cheese, great care should be exercised

that it be done in such a manner, as will allow the free passage of the cider from the pomace. The primitive custom, was to lay upon the platform a quantity of straw, upon which, a quantity of pomace was placed, and the edges secured by laps of straw, thus alternating straw and pomace, until the pile was complete. The object of using the straw, was to hold the mass together while it was being submitted to a pressure, and also to serve as a means of exit for the cider. But this latter purpose it accomplished very imperfectly, so that correspondingly greater pressure was required, than would otherwise have been necessary. An improvement, was in the substitution of hair cloths. But from the want of a proper knowledge how to apply them, the difficulty of procuring them, or the enhanced cost over straw, they have not up to the present time come into general use. Notwithstanding the high price of hair cloth, and the large expense as an original investment, there can be little doubt but that for a series of years, it would be the cheapest material in the end, and much better than any thing else for the purpose named. Cider makers, know, it is not an uncommon circumstance with them, that they are unable to extract the cider from the pomace, when laid up into a cheese, under the heaviest of pressure; the press frame will snap; occasional jets of the fluid will spirt out in various directions, for great distances, indicating that the means of egress for the fluid is not sufficient for its escape, and time, therefore has to be given, (with the employees waiting,) for "the cider to run." Those more impatient, adopt the method of relaying the cheese and adding more straw, which measureably relieves the difficulty. We are among those, however, who

contend that straw, should not be used under any circumstances for cider making. In the first place it is a waste, both of straw and cider. The straw is liable to be foul and musty, thereby imparting unpleasant odors to the liquor. And in the last place, there is no necessity for its use, and it is better to dispense with it altogether. Our substitute, would be gunny cloths, hop or wool sacking. We have used gunny cloths with entire satisfaction for several years past, and find them to answer nearly as well as hair cloths, and are much superior to straw in every respect. We usually lay, in the first place, two thicknesses of cloth upon the platform, after having encompassed the inside of the curb, with one thickness of the same, we then spread over the bottom of the curb, pomace, to the depth of from three to five inches. Upon this two more thicknesses of cloth are laid, and the same quantity of pomace, alternating cloths and pomace, until the curb is filled. The cloths upon the sides are then laid over the top, with two more thicknesses, upon which, planks are placed, and the necessary blocking added, ready for the screws to be put in operation. The practical effect of using two or more thicknesses of gunny cloth is, that it allows the cider to pass through them, also to serve as conduits through the means of the meshes, for the fluid to escape. This, it will be borne in mind, cannot be done with one thickness of cloth, and hence the failure of all those who have not succeeded in the use of hair and other cloths.

To ensure success in this matter, we conceived the idea, about the time of closing up cider making, in the fall of 1868, of a plan, for the use of any kind of cloths, which would secure the expression of the apple juice, in

the most rapid manner, and it became in its practical operation, exceedingly satisfactory.

The plan adopted, may be explained substantially as follows: Make several frames, of lath or thin boards of one-eighth or three-sixteenths of an inch in thickness, and of the length of the inside of the press curb, by first cutting the pieces in strips of about one inch in width, and laying these strips upon a table or bench, side by side, leaving about three-sixteenths of an inch space between them, until the width of the curb is reached. Then place upon the top, at right angles, similar strips, side by side, leaving the same space between them until the lower strips are covered. Tack them securely together with short copper nails, and the frame is complete (see fig. 9). Or if the curb to the press be large, this frame, may be made in sections, quarter or half size, which might be more convenient for handling, with less danger of breakage.

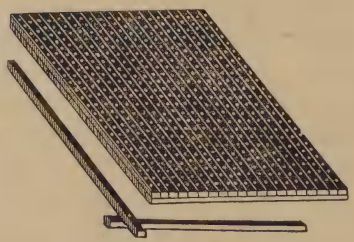

Fig. 9.

These frames, are designated and known as pomace frames, and are used in laying up a cheese as follows: First, place upon the platform of the press, one of these frames, seeing that it covers the entire inner surface of the curb. Place upon the top of this frame the cloth or cloths, at the same time covering the inside

of the rack, with one thickness of cloth, laying the lower ends over the frame, and then fill in with pomace to the uniform depth, of from three to five inches, Then lay on cloths, and upon the cloths place another frame, upon which, lay other cloths, and add three to five inches of pomace, thus building up successive layers of frames, cloths, pomace, cloths, frames, cloths, pomace, alternating in like manner, until the curb is filled, and then proceed as before described.

The frames, separate the cloths and allow the free passage of the cider, from all parts of the cheese through and between them, while the openings between the slats of the frame, act as conduits for the liquid to the outside receptacle. But a few minutes only, is required to express the juice from a large cheese, and if there be room within the curb, other layers may be added and treated in like manner, before relaying the cheese. In removing the cheese from the curb, unlock and remove one end of the curb frame, after having removed the blocks, and then take hold of the cloths and remove each layer successively. Shake the cloths, and clean the frames as they are taken off, removing the dry cheese to a platform, previously prepared to receive it. The cloths, as they become gummy should be thoroughly washed, and when not in use should be dried and kept in a dry place. By this process of extracting cider from the pomace, it will be seen that the pressure upon a cheese is in all directions, top, bottom, ends and sides, and no necessity exists for cutting down a cheese and relaying it for further pressure. Besides the mill is not littered up with straw and filth, an unnecessary nuisance in all cider mills where straw is permitted to be used.