

Charcoal Briquette Press

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A charcoal briquette press is a device used to compact char mixture into solid briquettes that, after being dried, can be burned as fuel. A press ensures the material in a briquette has been properly bound together and will not fall apart during packaging, transport, or burning.

The press is part of a larger charcoal making process. First, the operator heats waste biomass (such as sawdust, peanut shells, or sugar cane waste) to very high temperatures by burning part of the material and smothering it before all of the material is consumed. This process leaves a fine, black powder (called char) that is mixed with a starch binding agent. The operator compacts the char mixture into briquettes, allows them to dry, and then can use or sell the briquettes as fuel.

An efficient briquette press is essential to a cost-effective charcoal-making process. Charcoal made out of biomass other than wood must be compressed into briquettes before it is acceptable on the market. Individuals looking to turn a profit on charcoal briquettes must use a briquette press, such as this one, that achieves maximum compression and creates as uniform and as dense a briquette as possible.

Charcoal can be compacted by several methods, including simple arbor presses such as the one described in this document, other presses, and extruding machines. This press, designed to be inexpensive and easy to construct, compresses two 2 ¾" diameter, 1 ¼" thick briquettes at a time. The press consists of five distinct parts: the base, the lever arm, the hinge, the mold, and the plastic inserts.

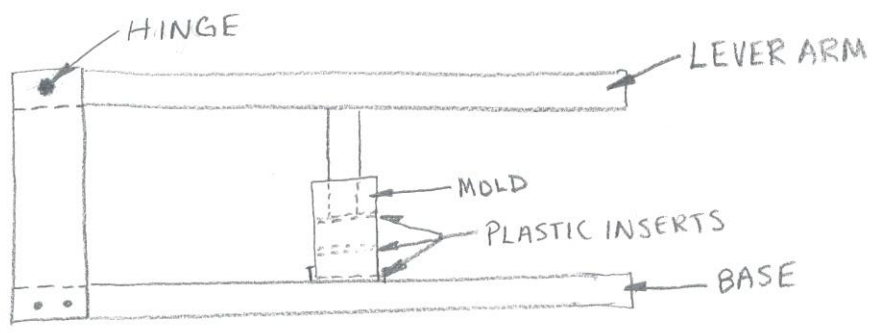


Figure 1. Charcoal briquette press

Description of Parts

Base

The base rests on the ground. The lever arm attaches to it and the mold rests on it.

The base consists of three pieces of 2"x4" lumber. The first piece, 2' long, rests on the ground, with the widest faces facing upward and downward. The second and third pieces, both 11" long, attach vertically to the end of first piece (as shown in *Figure 2*). The three pieces are attached using stainless steel nails. The second and third pieces have 5/8" holes one inch from the top to hold the hinge.

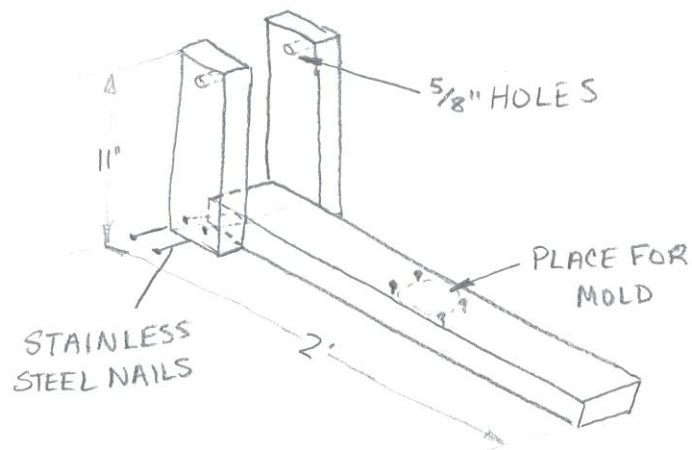


Figure 2. Base

Four nails, driven into the long bottom piece around the area where the mold rests, keep the mold from sliding off of the base during pressing, but allow the mold to be lifted off the base to remove the compressed briquettes.

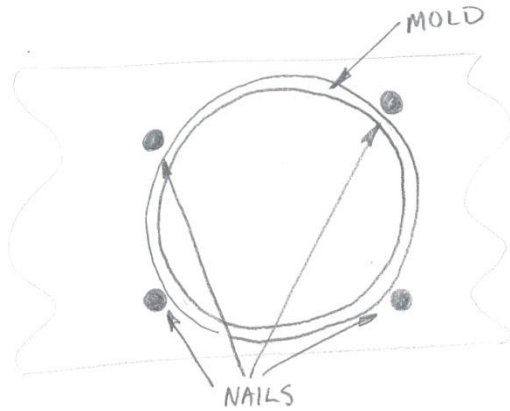


Figure 3. Nail configuration on bottom piece of base

Lever Arm

The lever arm actually compresses the briquettes. It transfers the force the user applies to the mechanism into pressing the char mixture into the mold. The lever arm consists of two attached pieces of lumber—a longer piece oriented horizontally and a second, smaller piece extending downward from the middle of the longer piece.

The longer piece of the lever arm, a 2-foot long piece of 2"x4" lumber, has a 5/8" hole drilled through one end to hold the hinge. Stainless steel nails attach the 5-inch long protrusion of 2"x2" lumber to the underside of the middle of the longer piece.

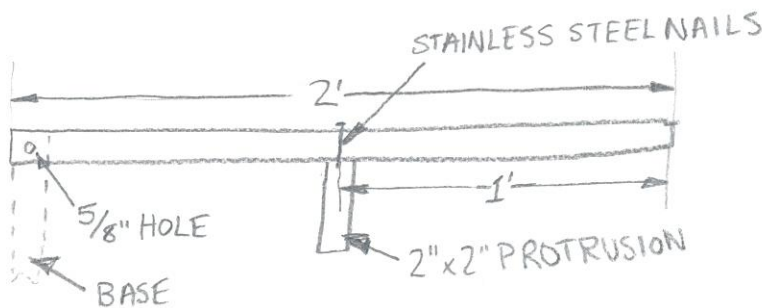


Figure 4. Lever Arm

The hinge goes through one end of the lever arm and attaches it to the base. The user presses down on the other end. The protrusion in the middle compresses the char mixture.

Hinge

The hinge connects the base and the lever arm. It consists of an 8" long $\frac{1}{2}$ " diameter bolt and nut. The bolt runs through the two 2"x4" pieces of lumber extending upward from the base, and through one end of the lever arm.

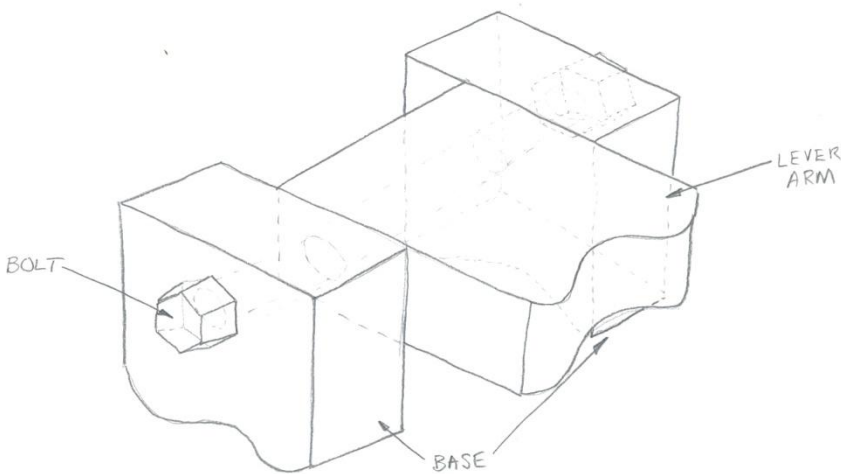


Figure 5. Hinge Assembly

Mold

The mold is made from a 4" length of 3" PVC pipe. A user loads char mixture into the mold along with plastic inserts (described below). The mold forms two briquettes $2\frac{3}{4}$ " in diameter and $1\frac{1}{4}$ " tall.

The mold rests on but is not attached to the base. During pressing, four nails driven into the base keep the mold in place. This feature allows the mold to be removed from the assembly. After the briquettes have been pressed, the user pulls the mold straight upward around the bottom protrusion of the lever arm to push the briquettes through the bottom of the mold.

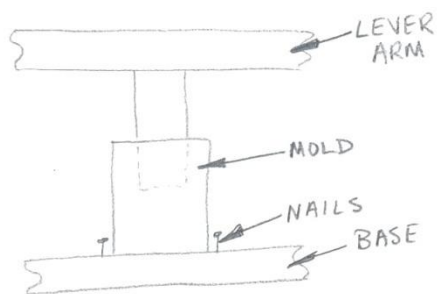


Figure 6a Mold resting on base

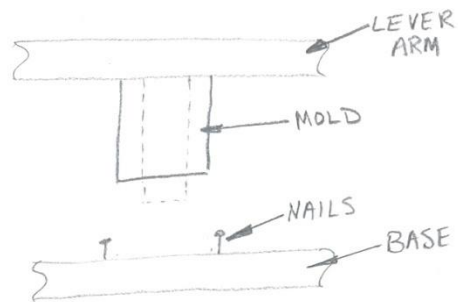


Figure 6b Mold pulled up to remove briquettes

Plastic Inserts

The plastic inserts are 2 3/4" diameter plastic discs, made out of thin, durable plastic, such as a milk jug wall. The inserts rest in the mold in three places: (1) between the char mixture and the base, to prevent the briquette from sticking to the base, (2) in between the two briquettes, and (3) between the char mixture and the lever (to distribute the pressure from the lever arm evenly over the cross-sectional area of the mold).

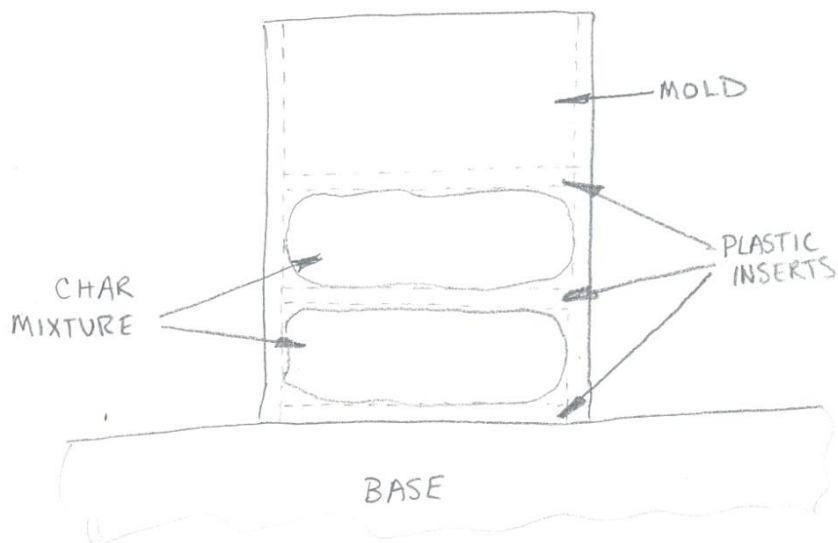


Figure 7. Plastic insert placement.

Description of Mechanism in Use

To operate the press, first move the lever arm out of the way by rotating it around the hinge to rest upside-down on the ground. Place the mold onto the center of the base in the area surrounded by nails. Load the mold in the following order with (1) one plastic insert, (2) approximately 1 ½ cups of char mixture, (3) another plastic insert (4) another 1 ½ cups of char mixture, and (5) one last plastic insert. Rotate the lever arm back around the hinge and move the arm down until the middle protrusion enters the mold. Compress the briquettes by pushing down or sitting on the lever arm.

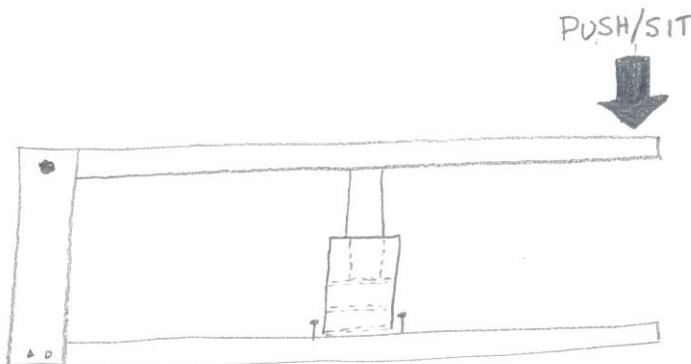


Figure 8. The user pushes or sits on the movable end of the lever arm to compress the briquettes.

Stop pushing down, but leave the lever arm in the same position. Pull the mold straight up around the middle protrusion of the lever arm, forcing the charcoal briquettes out of the mold. Remove the briquettes from the assembly, peel away the plastic inserts and set the briquettes out to dry. Once dried, they are ready to burn.

Conclusion

The charcoal briquette press is a simple and relatively inexpensive means to compact charcoal briquettes. It allows a person to apply up to twice their weight to compress a briquette with a lever arm. It is meant to be used in conjunction with a prototype charcoal making process using waste peanut shells. If successful, this mechanism, the process, and other equipment involved will be shared with people living in Haiti to help them earn extra income and provide an alternative to using wood char as cooking fuel.