Brake for a Power Hammer

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After struggling with the adjustment of my 50lb. Little Giant Hammer, I decided to follow Fred Caylor's advice and fabricated a brake. The basic design was suggested to me by Steve Schwartzer. The basic elements are (1) a pivot bracket; (2) a spring support bracket; (3) a brake shoe; (4) a spring; (5) a control rod; and (5) block adjustment shoes (optional) (Fig.1). The brackets were cut from a 1/8" thick steel sheet, the brake shoe was 1/2 of a leaf spring (2" wide & approximately 21" long), the spring was a spare (see plans for the Treadle Hammer available from ABANA) but a car-hood spring should do, and the rest came out of miscellaneous scrap.

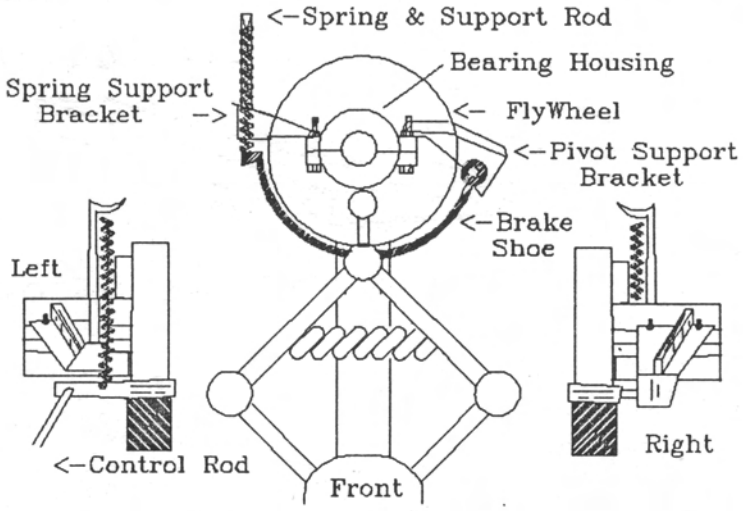

Figure 1: Overview of brake & components

Elements of the design will have to be adapted depending on the exact configuration of the hammer in question, so apply the following description with discretion. The first step consists of creating the support brackets (see Fig.2). Each bracket is hung on the hammer from a pair of bolts which close the forward bearing journal. Being cautious, I worked on one side at a time (thus allowing the other side to continue clamping the bearing). My hammer rotates clockwise (as viewed from the front), so the pivot bracket was installed on the right side. The pivot bracket must be constructed so as to place the pivot pin close enough to the flywheel so that the brake shoe just clears the flywheel. The pivot bracket was deliberately built too long. After placing it in position, it was then bent downwards until the pivot pin was in the correct position. A 1" x 1/4" bar was then forged to match the curve of the bracket (from between the nuts to the outer edge) and was welded in place. This bar acts to provide rigidity to the bracket and locks in the adjustment due to the bending of the bracket. The pivot pin can also be bent (near its exit from the bracket) to further fine-tune the alignment. After the final welds, the bracket was wire brushed, primed and installed.

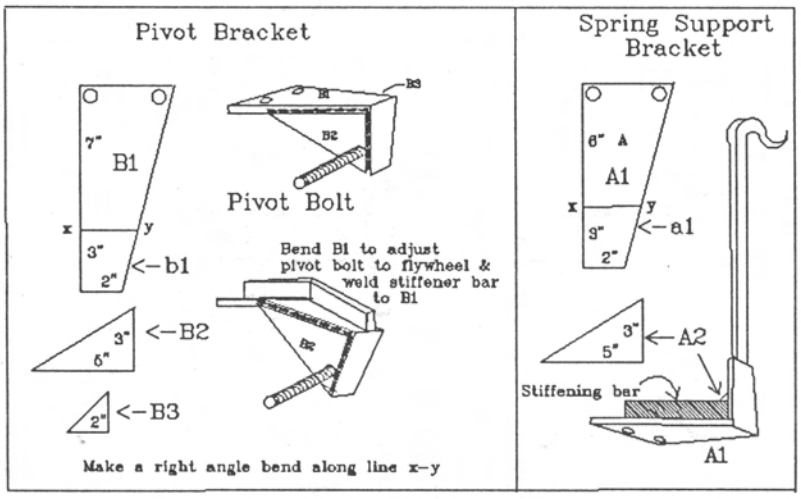

Figure 2. Details of support brackets

Be careful in retightening the bearing journal bolts - too tight and the hammer will not operate, too loose and the bearing won't be well supported.

The spring support bracket has a similar bar welded into it to provide rigidity (but the bracket need not be bent). The length of the spring support rod should be dictated by the length of the spring. The rod in my installation was approximately 14" long. The bracket is bolted in place on the opposite side of the bearing mount.

The brake shoe was constructed from half of an old leaf spring (I'm lazy - it already had an eye and was partially curved to boot). The curvature of the leaf spring was increased to match the diameter of the flywheel, a right angle bend (away from the flywheel) was made on the eyeless end, a bar was welded into the angle (see Fig.3), and the shoe was allowed to slowly cool (try to keep the eye as cold as possible if you cannot easily remove the rubber sleeve and bushing - even then, try not to breathe the fumes). A series of 1/8" holes was drilled every 4 to 6" along the length of the shoe. After priming, a strap of heavy leather (1/4" thick x 2" wide x 19" long) was contact glued and riveted (using 2-part leather rivets) to the inner surface of the shoe. The rough surface of the leather was positioned towards the flywheel. The shoe was installed by slipping a bushing and washer over the pivot pin so that the shoe was aligned with the flywheel and then clamped in place with another washer and a lock nut.

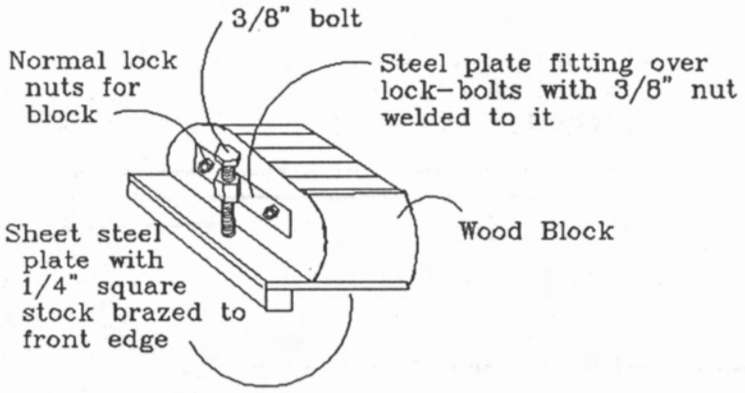

Figure 3: Block adjustment devices

The spring was stretched between the top of the support rod and a hole drilled in the control bar of the shoe (see Fig.1-Left view). A rod extended from the rear of the control bar to a turnbuckle attached to the foot lever of the hammer. Adjust the turnbuckle until the brake releases just as the clutch of the hammer engages. When adjusted, you will be able to stop the hammer instantly and also be able to incrementally position the head to any position that you wish (i.e. you can use the beast to strike single blows if you want to).

The final wrinkle arose from my frustration with shims and adjusting the wooden blocks (see Fig.3). The adjustment shoes were made of 16-gauge steel with 1/4" square stock brazed on their leading edges. After installation of the adjustment devices, block adjustments consist of backing off the lock-nuts, screwing the adjustment bolts in (or out), and retightening the lock-nuts. If I had built the brake before the adjustment shoes, I might well have been satisfied with shims. The total fabrication time was approximately 4 hours and due to a decent scrap heap, the cost was negligible.