

Using Gears to Pour a Beer

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“Fascinating, fun, and functional.”

That’s how Clayton Boyer describes the gears in the Brew Tipper, his wooden mechanism that pours a bottle of beer into a glass. He adds: “I love creating geared mechanisms and gadgets.”

Now, as a mechanism, the Brew Tipper’s operation is straightforward. You put a bottle of beer on a small platform on the left, you put a glass on a small platform on the right. Then, you turn a wheel at the front of the tipper. The wheel is connected to a rod that runs to the back of the tipper. The rod is connected to one of the tipper’s spur gears, the smaller gear. That gear drives the larger one. The larger gear itself is connected to a cam. The two gears lift and tip the beer bottle forward, while the cam tips the glass backward.

With both glass and bottle tipped, beer doesn’t splash in the bottom of the glass. Instead, it runs down the inside of the glass, so it doesn’t get too foamy. And if it does start getting too foamy, the tipper has a ratchet and pawl that can stop and hold the tipper in mid-pour.

For the tipper to work, though, the top of the beer bottle and the top of the glass need to be level with each other. So, Clayton designed his tipper to include several inserts. Each one fits in the bottom of the tipper’s bottle holder (the platform on the left). This way, a shorter bottle can be raised until the top of it lines up with the top of the glass.

However, the tipper pours beer slowly. The reason: leftover ingredients in home-brewed beer.

Naturally, the tipper can pour bottles of commercial beer or home-brewed beer. However, to pour home-brewed, the tipper has to pour slowly.

Clayton, a home brewer himself, explains. Commercial beer is usually filtered before it’s bottled. The filtering removes ingredients that weren’t fully absorbed when the beer was being made. Home-brewed beer, though, may not be filtered. A bottle of home brew, then, would include a small amount of leftover ingredients, which would sink to the bottom. So, when poured, a home brew would need to be poured slowly so the leftover ingredients stay in the bottom of the bottle, they don’t get carried into the glass.

Besides designing it for home-brewed beer, Clayton also designed the tipper with an amount of flexibility. He designed it so a person could alter that design and build the tipper to pour beer bottles bigger than a longneck, bottles like a Belgian or a bomber. Specifically, he provided clearance so a person could build a larger version of the bottle holder.

Clayton took about four months to design and build the tipper. However, he comments that it takes just a few days to build one from its finished plans. After building the tipper, Clayton digitized his plans and uploaded them to lisaboyer.com, the website he and his wife share. To see the tipper in action, there’s a video on [quilty1987](#), the YouTube channel Clayton and his wife also share. The channel includes videos on many of Clayton’s geared mechanisms.

As for his interest in geared objects, Clayton explains it started when he was a 10-year-old kid looking at how-to magazines like *Popular Mechanics*.

One day, he noticed an article about building a wooden clock. Clayton was interested, but had no money for tools or materials. “Pretty much all I could do was dream about building a wooden clock,” he comments.

In time, his dream receded in his mind. Decades later, though, as a retiree, Clayton was looking through a woodworking magazine when he noticed a picture. In it, a wooden clock was hanging on a wall.

Clayton’s dream returned, and it sparked more than the building of one wooden clock. ⚙️



The Brew Tipper’s gears and cam work together to tilt a beer bottle forward and tilt a glass backward so beer runs down the inside of the glass, which keeps the beer from getting too foamy. (Photo courtesy of Clayton Boyer)