

Motorizing a Hand-Cranked Street Organ

Joseph L. Hazelton, Contributing Editor

Ron Walters became interested in hand-cranked street organs when he saw one playing in a video. He summed up his reaction with: "How cool is that."

He wasn't interested in just listening to the organ, though. He wanted to build one—and motorize it. He wanted to take the organ, a mechanical device, and make it more mechanical by adding power transmission components.

A hand-cranked street organ is, of course, a pneumatic device. But, it's also a mechanical device. Its parts include bearings, clutches, and a drive system that consists of a belt and two pulleys.

Adding more power transmission parts was natural for Walters. Although retired for 25 years, he spent his professional career as a mechanical engineer. "I've been building stuff all my life," he said.

Walters decided to build a specific type of street organ, a John Smith Senior 20. Now, playing a Senior 20 manually is straightforward. You turn the organ's handwheel, which operates two bellows. They accumulate air, compress it, and force it into a regulator. The regulator uses that air to pressurize a box.

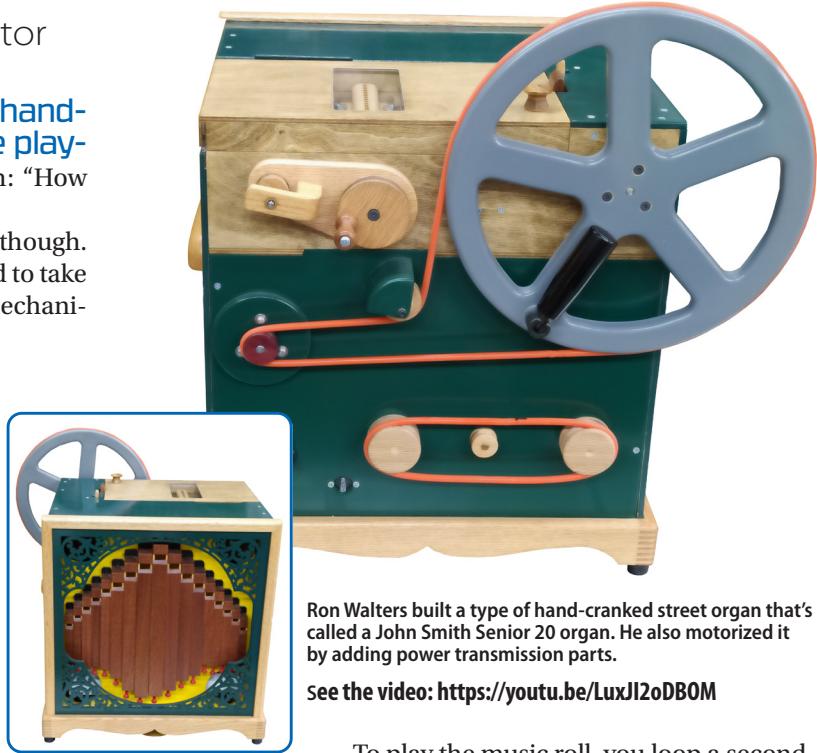
Inside the box is the organ's music roll, a strip of perforated paper wrapped around a spool. There's also a second spool for taking up the roll as it's played. When played, the roll moves from one spool to the other, passing over a tracker bar. Connected to this bar are 20 hoses, each one leading to an organ pipe. Working together, the roll and bar release pressurized air through one or more pipes at a time, playing the organ's music.

To motorize this process, Walters installed a 24-volt DC motor inside the organ's case, running the motor at just 12 volts. He also installed a motor controller.

Normally, as a manual machine, a Senior 20 has one belt drive, which is for the music roll's rewind mechanism. The rewind drive is on the organ's back panel and has two pulleys, one manually driven, for rewinding the music roll.

To motorize the organ, Walters created a second belt drive, one with three pulleys. The drive pulley is connected to the DC motor. The driven pulley is the organ's handwheel. And the third pulley is an idler, which redirects the belt so it doesn't rub against a nearby part.

However, Walters wanted the motor to play the music *and* rewind it. So, he made a 'rewind' belt that loops around the rewind mechanism's two pulleys and around the motor's pulley, and he installed his motor controller with a forward/reverse switch. Also, for up-tempo playing of the music, the controller includes a speed control.



Ron Walters built a type of hand-cranked street organ that's called a John Smith Senior 20 organ. He also motorized it by adding power transmission parts.

See the video: <https://youtu.be/LuxJl2oDB0M>

To play the music roll, you loop a second, longer belt around the motor's pulley, the handwheel, and the idler pulley. Then, you flip the forward/reverse switch to its forward setting.

To rewind the roll, you take off the 'play' belt and put on the shorter rewind belt. You disengage the mechanism's clutch by pushing down on the clutch's lever and pulling it towards you. At that point, the take-up spool can spin freely; the music roll can be rewound. Then, you flip the switch to its reverse setting. To re-engage the clutch, you push the lever away from you.

Walters powers the motor with a 12-volt battery that he keeps in a small, wooden box. He connects the motor and battery by taking the organ's power cord and plugging it into the battery box's electrical socket.

To modify his Senior 20s, Walters used his imagination and drew on his experience as a mechanical engineer. To build them, he worked from plans bought on the web. However, he described the plans as not detailed. So, to help other builders, he created a series of videos for his YouTube channel, Ronald Walters, which is at www.youtube.com/c/RonaldWalters2010. The series is 33 videos, a step-by-step process for making a Senior 20. He also created seven other videos on motorizing the organ.

Today, Walters keeps his Senior 20s in his backyard workshop, but he'll take friends out there and play the organs for them. That's when the benefit of motorizing them is clear. "It's quite easy to just turn it on and let it play for somebody," Walters said. **PTE**