

## Raising the Meetinghouse in 1836

Anne Krantz, Historian

As a member of the Capital Campaign building committee, last summer I volunteered to inspect the crawlspace under the narthex, including the space under the tower. It was an astonishing adventure. I crawled through the tiny opening in the back corner of the WA workroom, to discover a dry sand floor with a few boards to crawl on. I hauled two flood lights on long extension cords so I could take photos to document the condition of the timbers and supports. This exploration happened the day after a big summer storm. The sand floor was as dry as a desert, as well as all the wood timbers and beams.

But what was most amazing were the two piles of flat stones that support huge hand-hewn beams. After consulting the floor plan from the 2000 restoration, I realized that they hold up the two inside posts of the tower!!! What a crude appearing system, but it obviously works since they have been there since the meetinghouse was moved in August of 1836.

Thinking about this for weeks, it finally dawned that they had to jack up the tower at the same time they jacked up the meetinghouse. The building was raised in order to dig the basement under the sanctuary that the town wanted for meetings. They raised the building about 8 feet. Obviously, since the tower is attached to the building, the tower was raised simultaneously the same height.

I sent the photos to James Garvin, a New Hampshire historical architect who spoke at our final 275th anniversary event in May 2017. He was astonished and fascinated too:

"I wish that we had more information--especially surviving examples of the hardware--on the ways by which buildings were lifted in the 1700s and 1800s. What we do know is that it was very common, especially in cities, to lift buildings and insert new stories underneath, and to move buildings some distances. Somewhere I have a list of 70-odd buildings that were moved in Portsmouth alone in the 1700s and early 1800s.

According to written accounts, buildings were lifted using large "screws," sometimes made of cast iron and sometimes, apparently, made of hardwood. These worked on the same principle as modern screw jacks, which are still used to lift buildings. When I worked at Strawberry Banke in Portsmouth, we hired an expert building mover from Tilton, who lifted entire houses, chimneys and all, with screw jacks. One man was stationed at each jack, and each simultaneously gave the screw a half turn on a signal from the boss. After the houses were lifted sufficiently, timbers were placed underneath and the buildings were rolled on railroad tracks to a new location.

Today, building movers tend to use hydraulic jacks to accomplish the same thing, but the principle is the same, and goes back centuries.

Of course lifting and sliding a building is one thing, but lifting it and turning it 90 degrees is another--especially if the building has a heavy tower at one end. In the case of most meeting houses, including yours, the tower is firmly tied to the main building by heavy timbers that extend from the upper tower into the attic, where they rest on the tie beams that extend across the building at each roof truss. Still, the tower would have to be lifted from its sills at the bottom--where you were--simultaneously with the jacking of the main building." Email, 9/2/18

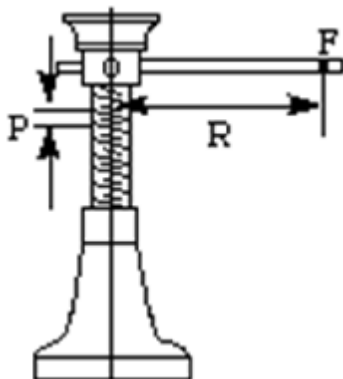
Nathan Call of Concord, NH, who was hired to execute this miraculous meetinghouse moving project, not only possessed expertise, courage and confidence, but at least eight screw jacks; four for the meetinghouse corner posts and four for the tower corner posts. He also supplied the block and tackle equipment; the ropes and pulleys, used to pull the structure to its new site. He performed this work in 11 days for \$86.25 in Aug. of 1836. See *April, 2018 Spire, Meetinghouse Moving Week, August, 1836*.

How screw jacks work:

David Macaulay in his wonderful children's book *The Way Things Work* describes a screw jack this way: A screw jack ...uses a screw mechanism to lift a car (or building). The handle may move fifty times further than the car, so the force on the car is fifty times greater than the effort on the handle.

One of the most common applications of the principle of the inclined plane is in the screw jack which is used to overcome a heavy pressure or raise a heavy weight of  $W$  by a much smaller force  $F$  applied at in the handle.  $R$  represents the length of the handle and  $P$  the pitch of the screw, or the distance advances one complete turn. <https://www.cs.cmu.edu/~rapidproto/mechanisms/chpt2.html>

The "tackle" that was mentioned in the account of Nathan Call was "block and tackle," or large pulleys and ropes. These were and still are used to pull or lift heavy



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objects, and they provide a great multiplication of the effort as workers pull on a rope that passes over the sheaves in each "block" or pulley. The same kinds of tackle were used for the rigging in a sailing ship.

I wish that we knew more and, as I said, that we had actual examples of the implements that were used to lift and move buildings before the advent of modern crew jacks and hydraulic jacks. In any case, early building riggers and movers were able to accomplish miracles through knowledge and hard labor.

I looked up Nathan Call in Bouton's History of Concord (1856), hoping to find more about him. Somewhere, I think that I have read accounts of his raising church steeples, etc., but today found little in Bouton's book. I'll keep looking.

Thanks very much for sharing your adventure and great photos with me!

Jim