(This was originally written Ruffner's the fall '01 newsletter; revisions shown italicized made 1/04 - MS)

Hello from the old new guy. While I feel like I've been working on behalf of the mountain for eons, I've been "official" since this spring. Now I've been invited to share a little of what I know about Ruffner's mining operations.

The geologist William Henry Ruffner first described the mineral resources on this peak of Red Mountain in the early 1870's. Like many of the period's geologists, he had a financial stake in exploiting those resources; thus, he was a bit like today's dot-com Internet entrepreneurs, in that he expected to make money from the then current "hot" technologies.

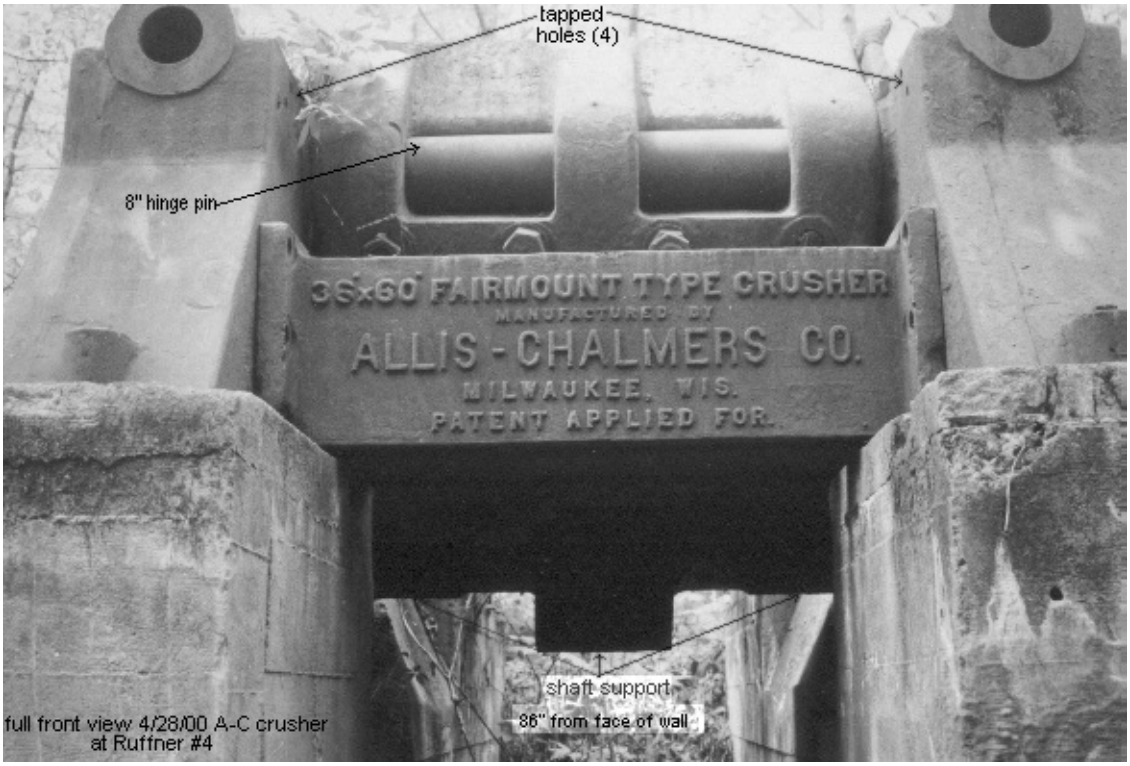
Georgia Pacific railroad saw an opportunity for freight revenues; so it provided the financing for what was later to be named Sloss Sheffield Steel & Iron Co. In the late 1880's, Sloss commenced mining operations at Ruffner. By the early 1890's, Sloss had 6 geographic/administrative areas mining the hematitic sandstone that colors much of the mountain brownish red. There were, additionally, 2 *(I now believe there were actually several)* non-Sloss iron ore mines on Ruffner. Sloss also quarried limestone, another key ingredient in the ironmaking process, from the high outcrop on the southwest end of Ruffner. The big quarry, with its panoramic overview of Birmingham, remains the most popular hiking destination at Ruffner.

Some time ago, while engaged in my favorite activity (wandering around the forest on Ruffner Mountain), I was taken aback when I came upon a massive piece of mining equipment standing in the middle of nowhere. The recent trash convinced me that it was known to some people, but obviously not many since there was some serious bushwacking required to get to it.

A-C crusher at Ruffner #4 4/27/00
front view (all dimensions in inches)

We have 2 extant crushers of the "coffee grinder" design on Ruffner. The remains of the gyratory cone crushers at mines #2 & #3 are quite similar to one which can be seen easily on Arkadelphia Road, at the corner of Wade Sand and Gravel, not far from I-59. The crusher at Ruffner #4 is entirely different, and thoroughly enticing. Note the wording on the stiffener beam. I had no idea what

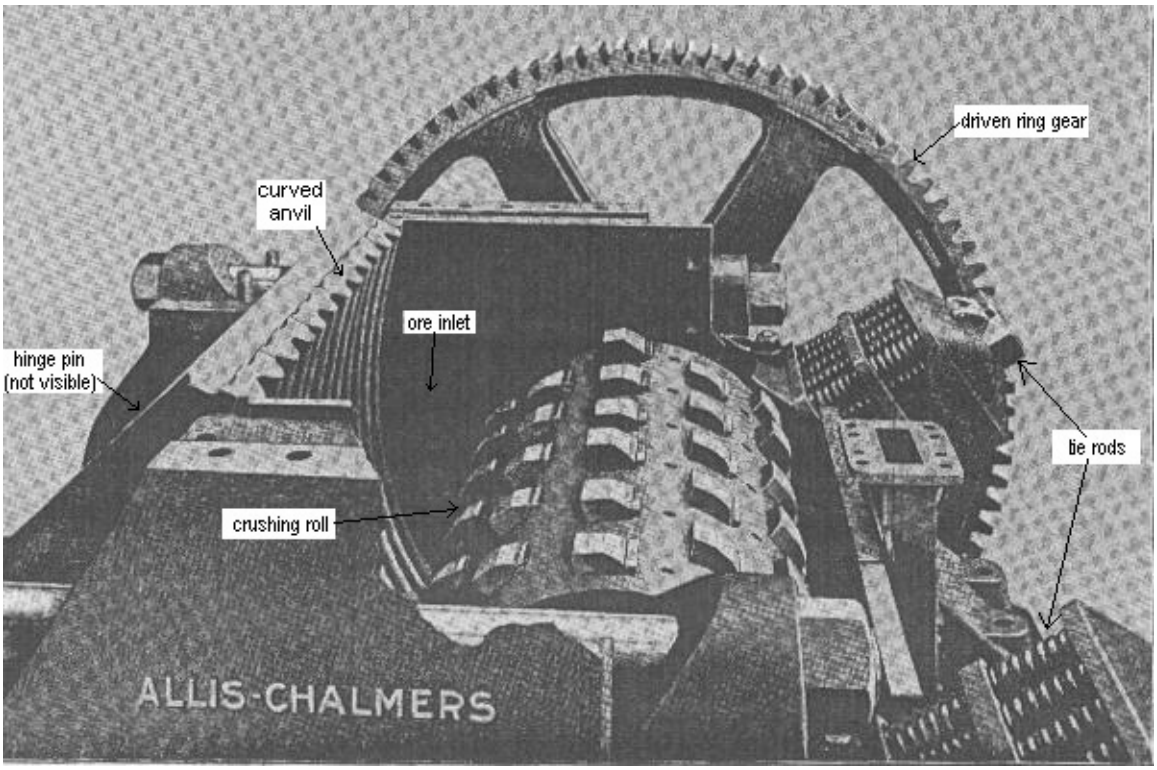
those dimensions referred to, nor even whether they were inches or feet - the mark after the numbers looked like ', not ", even though they are in fact the dimensions in inches. My best indications are that this crusher saw duty from the 'teens into the early 30's. ***(I now believe this crusher saw service beginning in the very early '40's for perhaps less than a decade.)***



After much help from people kind enough to respond to my e-mail inquiries, and especially an afternoon spent with Bob Yuill (who restores historic machinery), I now believe I have a reasonable grasp of this crusher. In fact, its story is tied to the kind of rocks and soil in the vicinity.

I've already mentioned 2 of the 3 prominent rocks found at Ruffner, sandstone & limestone. The third occurs along the eastern side of the mountain, parallel to Ruffner Road that runs between Irondale to Trussville. The chert that occurs there has been used by humans for thousands of years, as evidenced by stone tools that we've found. Recently, it had been quarried for roadbed material, etc.

The Fairmount type crusher took its name from the same named town in Ohio, where it was used successfully as a limestone crusher. There is widespread consensus that this type of single roll crusher is not the ideal choice for a primary crusher; but it is a very good choice for wet and/or sticky, even frozen materials. It is especially suitable when there are large rocks that can clean the stuck-on material from the raised teeth attached to the roll. Such material is exactly what is prominent around the site: large chunks of chert (flint) mixed with sticky clay and hematitic sandstone. So the crusher was "job-fitted" for its duties at this location on Ruffner.

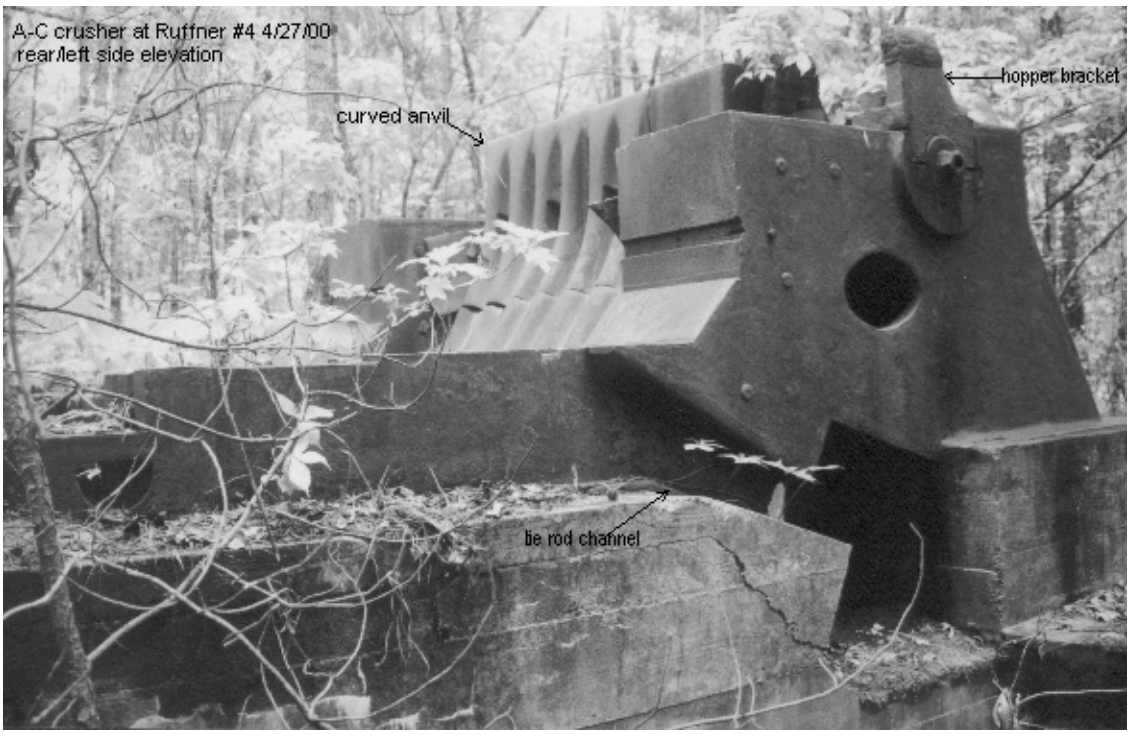


This monster piece of equipment is an engineering wonder. Such crushers continued to be promoted in the trade into at least the `50's even though their capacity was limited. The industry doesn't expect more than a 2:1 reduction (for example, 8" thick rocks would be crushed to 4") from single roll crushers. Much higher reductions can be had with the coffee grinder and hammer style crushers.

The specs on the Fairmount type crusher are quite impressive: a 200 hp electric motor, mounted on an I beam behind the crusher, was attached with a multiple V belt drive to a ring and pinion gear on the outrigger side of the roll. This machine could crush 150 to 500 tons per hour. The roll, a 3 foot diameter by 5 foot long cast steel cylinder (with raised teeth), had a flywheel (approximately 6 1/2 foot diameter) on the side opposite the driven one. In fact, some of the grease that lubricated the bearing at that end is still on the crusher's foundation. Allis Chalmers made all of this, including the motor, bearings, multiple v-belt drive (which it patented as the Texrope drive), roll, frame, etc. This massive roll, with its massive flywheel, turned 200 RPM. Once this thing got going, there was a LOT of inertia. And that's the really interesting part.

A hopper was mounted above the roll, and the iron ore dropped between the roll and the curved anvil. The only extant portion is the frame and curved anvil that cradled the crushing roll, along with the remains of the hopper brackets which were clearly and neatly burned through when the hopper was removed. The crushed ore dropped onto a conveyor belt line below the crushing roll. Then the crushed ore was transported across the ravine, where it was put on another conveyor line running at approximately a right angle to the first. Thereafter, the crushed ore's journey went slightly differently at different times: the ore was put onto the Birmingham Mineral Railroad's ore cars for transport to Sloss's 1st Ave furnaces; or it charged the rotary kiln ore concentrator, whose remains can still be seen. *(I now believe the ore was always conveyed over the rr to a wooden ore bin; then put in a brick building with hoppers in the floor, where it charged the rotary kiln).*

Back to the really interesting part, namely, what happens when the irresistible force meets the immovable object? The crusher allowed for ore that wouldn't crush, either because it was too big, or because it was too hard, or whatever. The corrugated chilled iron or manganese steel curved anvil, which is still intact, was mounted on a huge 8" diameter hinge pin. Several nests of spring loaded steel tie rods attached that plate so it could pivot, allowing the opening to get wider if push came to shove. Then the problem chunk could drop away from the crushing roll. The channels that these bolts passed through are part of the frame of the crusher, and are clearly visible. That curved anvil took a major beating in its life, so much so that the lower parts of the sides are no longer as corrugated as the center.



With no trail going to this crusher that even resembles being passable, and the poison ivy as thick as it could be, and the rusting sheet metal and broken timbers littering the area, the site is basically inaccessible. But we still have this marvelous piece of engineering/mining history to remind us of our technological heritage.