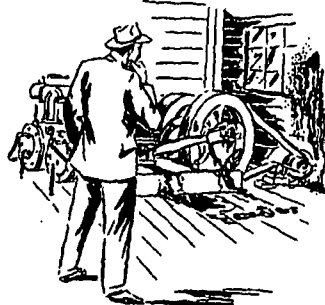




Machine was reversed, idler wedged



A character came to the door



"You mind your own business," he said



"Just follow my sketch," he ordered

Good Trouble Shooting Saves Air Compressor

When Howard L. Livingston of Los Angeles, Calif. took over as the "college boy" compressor operator, many, many years ago, he ran into a fouled machine and a tough character, besides. But common sense put compressor and the character in place

► WHILE WORKING MY way through college in 1911-1915, I operated air compressors for a construction firm during my vacations.

One vacation, the boss sent me to a nearby shop to help out. Before I went, I heard stories that this shop's air compressor was no good, that it gave trouble, ran hot, and that the machine was shut down every hour to cool off.

Our master mechanic said I might find the men hard to get on with. Later, I learned that the wives of superintendent and compressor operator were sisters. Also that the women had connections with the firm's head, which was main reason these men held their jobs.

On the job. As I approached the compressor house that first morning, the

silence told me the compressor was shut down. Compressor house was a board-and-batten shack. Next to it was a similar building, which housed the blacksmith shop and a small machine and general-repair shop.

A pile of odds and ends on the scrap pile outside the compressor house attracted my attention. I recognized them as the oiling system and the crankcase and crosshead covers of an air compressor. They were in good condition but very dirty. While I was looking them over, a man came to the door and looked me over suspiciously. He was about 60, had iron-gray hair and wore metal-rimmed glasses. He looked like a tough guy to work with.

The old boy blurted out, "Are you

the college boy they sent up to run this plant?" When I said yes, he followed with, "We don't want any of your book learning. On this job, we want men with experience—and a lot of it."

Compressor. By this time I was inside the plant. The compressor was a 2-stage cross-compound machine, belt-driven by a 200-hp squirrel cage motor. I noticed that her crankcase, crosshead covers and oiling system had been removed. Also, a homemade oiling system, requiring constant attention with an oilcan, had been installed. With covers removed, I saw the compressor-house interior was spattered with oil. Compressor was well smeared, too. The motor was far enough away to have missed most of the shower, but it was very dirty.

The driving belt was drawn very tight. Belt's underside near compressor flywheel was running over an idler pulley, supported on a homemade timber cribbing. Timber support had two wedges, evidently driven in by a sledge hammer, to increase belt tension. Motor was far enough from compressor so I couldn't understand why the idler.

Finds Cause. At this point, the old man left me and started oiling the bearings and crosshead guides. He then said they had cooled down enough, so he started the machine. I saw that the compressor was running over, instead of under. This made the top side of the belt the tight side, which explained the idler. It brought the crosshead thrust

up against the guides, instead of down on the shoe, which made guides heat. I learned that the oiling system originally was supplied from the crankcase. A scraper had taken oil off crankdisk rim and sent it through oil lines to the main journals, crankpins, crosshead pins and guides. But with the compressor turning in the wrong direction, there was no oil to scrape off. Hence, the homemade hand-oiling system. The tight belt, two tight bearings, and no flood of oil explained the hot bearings.

When I asked why the wrong direction, the old boy snapped, "Several of you young wise guys have asked me that. I've been running engines for 50 years and I never ran one turning under yet, and no engine I run is going to turn under. I know my business, so don't try to tell me nothing."

Compressor had suction-type inlet valves, which is the reason machine could run in either direction. I saw there was no use arguing, which accounted for not being fired that day.

At quitting time I met the superintendent. He wasn't friendly for the old compressor man had evidently put in a few words. But because I was the only compressor man available, the super said he'd try to put up with me for a few days. "But you better watch your step," he warned. I then learned that he and the old compressor man were leaving that evening; also, that the super would be back in a few days, but not the compressor man. Meantime, I

was to take orders from a foreman.

Makes Changes. Departure of the super and compressor man was good news. After dinner, I headed for the compressor house. I removed the homemade oiling equipment, cleaned and replaced the regular system. Next, I removed the muck from the crankcases and filled them with new oil. I cleaned and restored the crankcase and crosshead covers. Also, I slackened off the main bearings and wrist pins because I knew they would run quietly as long as they were kept flooded.

I removed the belt idler. My biggest worry was that the excessive strain on the belt might have removed its stretch. Then, with the idler removed, it would not grip the pulley and flywheel. Last, I reversed the motor's rotation.

Machine Works. Very much to my satisfaction, the belt, when started up, showed no signs of slipping. As the compressor got up to unloading pressure, I saw she'd need some adjustments. However, as shutting-down schedule had been established, I decided to use it if necessary.

The compressor ran seven days a week, so I started her up at the usual time. About two hours later, the foreman asked when I wanted to shut down. I told him the compressor was running OK, and from indications any necessary work could be done on it at noon or in the evening. Also, that during work hours it would run right through without stopping. From this time on my

main job was cleaning the motor, compressor, and inside of compressor house. Second evening I did give the inlet and discharge valves a going over.

When the super returned a few days later, he was annoyed at the changes I had made. But as the compressor ran quietly, and ran all day without giving any trouble, he let me alone.

The old compressor operator returned to town one evening some time later. But I packed up and left camp in time to avoid meeting him.

Here's a second chapter to this story.

In 1921, I worked as draftsman for a large utility. One day an engineer handed me a sketch. It was a one-cylinder compressor, to be belt-driven by a squirrel-cage motor. What surprised me was that the compressor was to run over, and installation included idler with tightening screw. As motor was far enough from compressor, idler wasn't needed. I pointed this out and gave my reasons for compressor turning in opposite direction. The engineer listened without comment, then told me to follow the sketch. That compressor also had suction inlet-valves and double-babbitted crosshead guides, so it could operate equally well in either direction. But he told me to follow his plans.

When you consider how some compressors are installed and operated, and the unskilled men who often run them, it's remarkable they stand up. My experience has been that all machines are good, if operated as designed.