

"The plan of extending to the company's employees the opportunity of purchasing stock on a monthly instalment basis, which was inaugurated last year, was continued this year with equally satisfactory results. During the fiscal year the number of stockholders has increased from 3,752 to 4,465."

A NEW MACHINE FOR MAKING AND SHARPENING ROCK DRILL BITS.

The Sullivan machinery company is placing on the market a new drill-making and sharpening machine, designed on the lines of the Imperial Sharpener, for a number of years built by Mr. T. H. Proske, of Denver.

The Sullivan machine bears only a family resemblance to its Denver prototype. The new machine is larger, more heavily built, more powerful. All its working parts are much larger and more substantial and with more generous bearing surfaces. The new machine is about double the weight of the old.

The Sullivan sharpener consists of two members, one horizontal, the other vertical, both mounted on a substantial box-shaped frame. These members consist of Sullivan 2½-in. rock drill cylinders, with standard "lite eight" or differential air thrown valve motion. The horizontal drill or hammer is used for upsetting the steel into the shape of the bit or shank, by means of suitable steel dollies, loosely set on the end of the shank or distance piece. In this hammer, the piston is a floating one, as in a hammer drill, and delivers its blows on the upset anvil block-head of the projecting shank.

The vertical member furnishes power for shaping the wings of the bit, etc., and for drawing out and finishing the corners. This work is done by steel dies, one acting as an anvil, and the other attached to the piston rod above, as a swage or hammer. The vertical hammer is operated by a foot lever, which is ordinarily held up by a coil spring. This spring also serves to hold up a release pin, running through the lower valve bushing, and in turn holding the valve away from the lower seat, so that the piston is always held at the upper or rear end of the cylinder, by live air, when the hammer is idle. When the foot treadle is depressed, the pin drops, allowing the valve to seat, and the hammer to start.

The steel is held in position while being upset by steel gripping dies set in a heavy vise, which is operated by air power. This vise simply grips the steel, the forming being done altogether by the upsetting dolly and hammer. This vise consists of a heavy steel yoke, through each end of which runs a massive steel post or column. These posts are joined at the foot by a second yoke, into which fits the lower end of a substantial block or toggle link. The upper end of this link is pinned to a cross head block, running horizontally in guides in the frame. The cross head and link are actuated by a piston rod connected to a piston 12 in. in diameter, running in an air cylinder at the rear end of the frame. When air is admitted behind this piston, the cross-head is forced forward and the link forward and down, carrying the yoke with it, and closing the vise with tremendous force. The power provided by the air is multiplied many times just at the end of the travel, when the cross-head and link form a knuckle-like lever. With air at 100 lb. pressure, the pull thus exerted is estimated at not less than 100,000 lb. per square in.

One of the steel gripping dies is pinned into a socket in the top yoke of the vise, while the other fits a similar socket in the frame or base below.

The vise and the upsetting hammer are operated by one hand lever, the valve motion being so controlled that as the handle is depressed, the vise is closed before air is admitted to the upsetting cylinder. Further depression starts the hammer reciprocating. The vise valve rod contains a link and coil spring which holds the valve in position to keep the inlet port to the upsetting cylinder closed when the machine is idle.

In stopping the machine, the lever is raised, first shutting off air from the upsetting hammer and, when this has stopped, opening the vise.

Air enters the machine at the rear by standard pipe connections. No hose is employed, except a short length for cleaning purposes. One arm of the inlet pipe enters the valve chest of the vise or clamping cylinder, while a second supplies the vertical hammer. An outside connection leads air from the side of the clamping cylinder chest to the valve chest of the upsetting hammer.

The exhaust from this cylinder is led directly into the frame. Exhaust air is led from the clamp valve chest, by a pipe and red passages, to the vise rod guides. Whenever the vise is opened, this exhaust air escapes, effectively blowing dirt and scale out of the dies and clamp. A similar arrangement is used in the vertical member to keep the dies clean.

Bits of any form and gauge may be on this machine, on steel of any shape, solid or hollow; and shanks also may be formed to order, providing proper dollies and dies are furnished. The collared shanks on hollow steel for rotators or hand-feed hammer drills, and the lugged shanks for mounted water jet hammer drills are two forms that are made economically and rapidly.

It is an accepted fact that no improvement on or even satisfactory substitute has been found for the making and sharpening of drill bits by the hand work of a skillful blacksmith, in so far as the character of the steel is concerned. The drill sharpening machine makes bits faster and more uniformly, as to shape and gauge, than can the most expert hand-smith. But the qualities given the steel by the constant hammering of the bit on the anvil are not secured by mechanical means such as squeezing or molding, sometimes used as a substitute. Practical drillmen know that the footage drilled by a new bit is not as great as it will be after the bit has been under the blacksmith's hammer a few times. In other words, the hammering refines, toughens and aligns the structure of the steel in the direction that gives greatest resistance to wear and shock.

This is the effect secured by the Sullivan sharpener, in which all work, from first to last, is done by hammering, so that to the uniformity of gauge and perfection of shape attained in other sharpeners as well, are added the qualities of increased durability, toughness and strength.

COPPER.

Boston, June 11, 1915.

Instead of abating in any degree, the foreign demand for copper shows signs of increasing. Cabled inquiries for the metal early in the week have been followed by new demands from abroad calling for much larger tonnages than were originally sought.

The present record-breaking buying movement in copper got under way in big volume last Friday, since which time sales have crossed the 100,000,000 lb. mark according to estimates of producers booking large quantities.