

An Improved Ore Skip.

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(Read before the April Meeting of the Mining Society of Nova Scotia.)

Among some of the crude mechanical contrivances used in the equipment of metaliferous mining plant, none is so much in evidence as the old fashioned skip with its wide flanged wheels behind and narrow ones in front, and which, in order to dispose of its load or contents, must turn upside down, and in so doing cause a large amount of wear and tear on any receptacle used in receiving the ore or waste rock, while its mechanical movements are anything but inspiring. The writer, having had an average amount of experience with this mechanical monstrosity and never having been satisfied with it as a means of handling ore, to say nothing of its ungraceful acrobatic performance, decided that in the equipment of the Golden Group mine at Montague to see if something could not be devised that would more successfully and satisfactorily fill the requirements, and, after investigating the various appliances used in hoisting ore from the mine, none were found that filled the bill, so it was decided to build one on entirely new and different lines.

The most natural way to unload a skip seems to be from the bottom instead of from the top, which necessitates the turning upside down of both load and skip. As the construction and operation of this skip is somewhat of a new departure, a detailed description of its construction and operation may be of interest.

The box or skip body is constructed of 3-16 in. steel built on 3 x 3 in. angle iron, riveted with $\frac{1}{2}$ in. rivets, the size being 30 x 36 x 60 in., having capacity for about 37 cubic feet. On the inside at both top and bottom there is a band of $\frac{1}{2}$ x 4 in. iron, which is securely riveted to the sides of the skip and the angle iron in the corners. This serves to keep the body of the skip square, and at the same time takes up the wear occasioned by receiving and discharging the load. On the bottom there are two steel doors, 15 x 36 x $\frac{1}{2}$ in. These doors are re-enforced by strips of steel $\frac{3}{8}$ x 6 in., and are securely fastened to the bottom of the skip on each side by 3 hinges on each door. As the doors have to withstand the entire shock occasioned by the dumping in of the rock, both doors and hinges are made exceedingly strong, the hinges being made of 1 x 5 in Swedish iron and run entirely across the doors, to which they are fastened with $\frac{3}{8}$ in. rivets. Across these doors running lengthwise are two axles, each 2 x 2 in. and extending 2 in. on each end over the ends of the door. These ends are turned down to 1 $\frac{1}{2}$ in. so as to receive the ends of the connecting rods. These rods, four in number, two on each door, or one at each end, are made of 2 $\frac{1}{2}$ x $\frac{1}{2}$ in. iron and are about 2 ft. long. These rods on the other end are connected with the side rods of bail which passes up on two sides of the skip and is held loosely in place by two clips on each side. These clips are made of $\frac{1}{2}$ x 4 in iron and are bolted to the body of the skip by ten $\frac{1}{2}$ in. bolts, bolts being used so that these clips may be removed at any time it is desired to remove the bail. This bail or side rod is made of $\frac{1}{2}$ x 5 in. iron and extends above the skip about 2 ft. These two strips or bail are connected across the top by $\frac{5}{8}$ x 6 in. piece which is mortised into the side rods. The top end of these side rods are connected to a ring in the centre, to which a cable or hoisting rope is attached. On the sides there are two sets of guide shoes. These are made of 3 x 3 in. angle iron, which are faced with 3-16 x 6 in. plate. Inside of these guide shoes and fastened to the side of skip are pieces of hardwood 2 in. thick, 2 ft. long and 6 $\frac{1}{2}$ in. wide. These are used as a rubbing board to take up the wear of the guides, the guides themselves being 4 x 6 in. spruce.

As I have explained, these connecting rods are attached to the axles on the door, the other ends being connected to the side rods which have a plate in the clips, the side rods themselves being connected

to the cable. It will be seen that the load and skip are raised by a direct pull on the doors and that when the skip remains suspended it is impossible for the doors to open. A skip when at the various levels in the mine ready for filling is always suspended by the cable so that the load is dumped in and on to these doors. When the skip is hoisted to the surface sufficiently high to admit of a car being run underneath, a set of clutches engage the sides of the skip, holding it securely; an electric signal is then given to the engineer, who slacks back on the cable, when the weight of the load forces down the doors, at the same time pulling down the side rods. As the width of these doors is only 15 inches, it will at once be seen that the rock in the bottom has only to fall 15 inches and whatever depth the car may be, while the remainder of the rock cushions on that already in the car, thereby very materially reducing the shock.

As the entire arrangement is nearly automatic, it is all done in a few seconds. When the material has been fully discharged the engineer hoists, the side rods now move up, the connecting rods close the door and the skip is now ready to descend for another load.

This skip was in operation about two months and during that time hoisted about 3,000 tons of ore and waste material and gave every satisfaction.

The Rare Metal, Tungsten.

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There is very little literature on the occurrence of this metal. It is found in an ore known as wolfram or wolframite and usually associated with tin, as, for instance, the tin mines of Cornwall.

A deposit of it was discovered last fall at North-east Margaree, C.B., in a ravine between and near the base of two mountains that attain an elevation of about 800 ft. The metal is in a fissure vein having red granite walls. The lead where first discovered in place was about 2 ft. thick, dipping at an angle of seventy degrees. It has been traced across the ravine for over 200 ft. into the mountains. Some development work has been done by driving tunnels into the mountains on the lead. This development shows that the lead takes the form of barrel shapes and lenses and in some places splits into two veins, one on each wall. The first block of quartz taken out of the lead at the point of discovery measured 2 x 3 $\frac{1}{2}$ ft. and contained upwards of one-half ton of ore, which gave 50 per cent. of metal, samples of which assayed 68 per cent. of tungstic acid. Since then very little metal has been found in the ore.

The winter not being a suitable time for prospecting work has been suspended until spring, when further development will be made in this and other parts of the district.

The uses of this metal are numerous. It is especially valuable as an alloy for steel and is useful in the manufacture of tool steel, armor plate, guns and projectiles on account of its hardening, toughening and self-tempering qualities. It has been found to be almost impossible to get a uniform temper in the manufacture of large guns with the ordinary alloy used with steel. In the recent war between the United States and Spain, the large guns were found to be practically useless after being fired from sixty to one hundred times. The chambers, not being of uniform hardness, became scored. A small percentage of tungsten as an alloy will give the uniform hardness and temper required to any mass of steel. Nine per cent. of tungsten alloyed with steel will give a self-tempered tool steel for lathe and other work which will stand great wear. It is also used in making dies and stamps. What is known today in commerce as "Mushet" steel, which is manufactured in Sheffield, contains 9 per cent. of tungsten. This steel sells to-day (small quantities being imported as ordered for special lathe work) for seven times as much as the highest priced ordinary tool steel. It is a self-tempering steel and