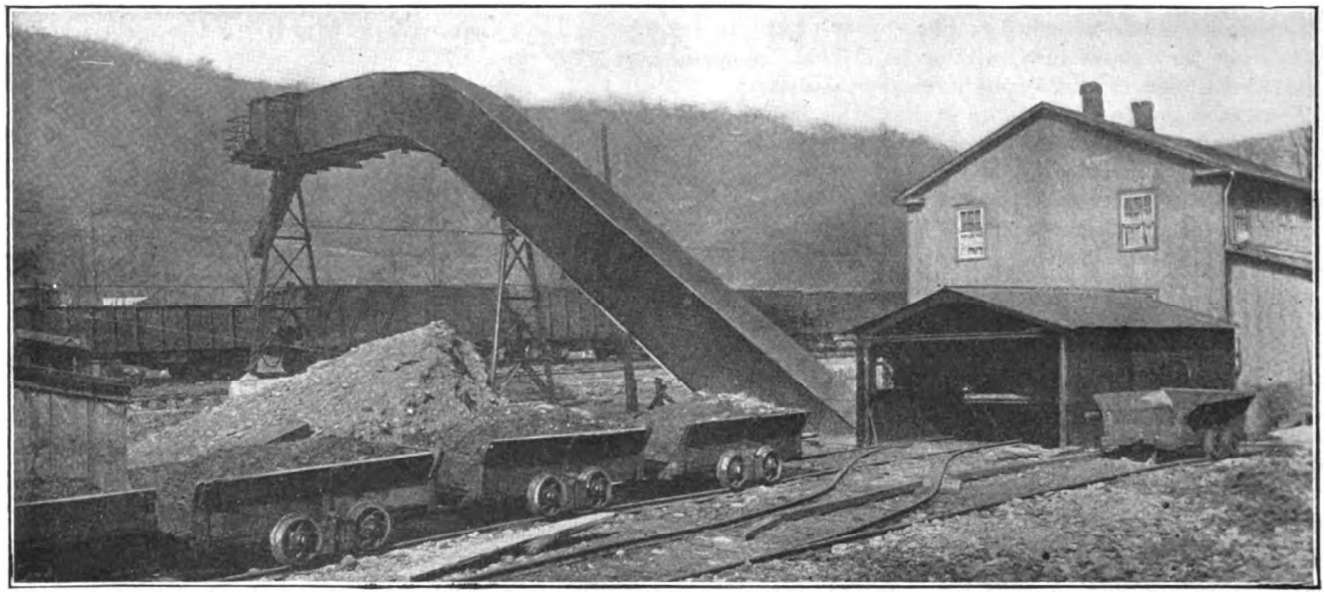


Coal Tipple for Small Operations

By H. B. MOSLEY
Philadelphia, Penn.

SYNOPSIS — *An extremely simple and inexpensive tipple for run-of-mine coal is here described. This consists essentially of a dump at ground or drift level and a scraper conveyor elevating and conveying the coal across a trolley track and highway and discharging it into railroad cars. A few slight changes would enable this tipple to make two or more sizes.*

BECAUSE of the increased demand for coal, the general shortage of labor and the Government-fixed price, it has become essential for the small operators to work on the most efficient basis possible and with the smallest amount of help.

The purpose of this article is to describe to some extent, at least, means by which the small operator (who cannot afford or who is not warranted in the expenditure of a large sum of money for a modern coal tipple) can handle his coal with the minimum amount of labor and at the least cost.

At the Paul & Dailey Coal Co., Western Port, Md., where coal is found outcropping in various beds up the hillside, a system for the mechanical handling of coal from mine cars to railroad cars has recently been installed and found quite satisfactory, not only in operation and maintenance, but in the man power saved.

At this mine mules are used to pull cars of coal to the mouth of the drift. This is driven in the lower coal bed, known as the "split six," being 6 ft. of fine grade bituminous coal split in the middle by a rock binder 1 ft. thick. From the mouth of the mine the cars are taken over a scale and weighed. First, however, the mules are unhitched and taken back into the mine.

After the cars are weighed they are sent down a slight incline and discharged by means of an automatic dump into a receiving hopper. The empty cars are switched to another track and sent down grade to the entrance of the mine again. It was the original intention to have the scale housed in the same building with the receiving hopper and automatic dump, but this meant that both loaded and empty cars would have to pass over the scale, so the other method was adopted.

The receiving hopper is 10 x 12 ft. in plan and built of $\frac{1}{4}$-in. steel plate, securely stiffened with angles. This hopper is attached to the sides of a concrete pit by bolts set in the concrete. The housing over the hopper and the automatic dumper is of light steel, "angle-iron" construction, sheathed with No. 22 gage galvanized corrugated iron.

From the receiving hopper the coal is fed into a flight conveyor by a reciprocating feeder. This feeder consists of $\frac{3}{16}$-in. side plates 18 in. high, attached to the outlet of the hopper, and has a $\frac{1}{4}$-in. plate bottom to which is attached shafts and rollers on which it reciprocates. These rollers travel on angle-iron tracks which are hung from the feeder sides by cast-iron brackets. The feeder plate is driven by means of a wristplate and pin and eccentric rods which are actuated by a substantial chain drive from the tail end of the conveyor.

The conveyor is built of two strands of 9-in. pitch steel roller chain having $\frac{3}{4}$ x 2$\frac{1}{4}$-in. side bars, $\frac{7}{8}$-in. pins and 3-in. hard cast-iron rollers at each joint, between which are attached at 18-in. intervals $\frac{3}{16}$-in. steel plate flights, 10 in. high by 20 in. wide. This chain has an ultimate strength of 50,000 lb., but is rated at 2300 lb. working strength by the builders. The flights are built of a single piece of plate flanged back on both sides and securely attached to the chain. This makes a rigid and serviceable flight.

The carrying run of the conveyor operates in a steel trough having 9 in. x 13$\frac{1}{4}$-in. channel sides and $\frac{3}{16}$-in. plate steel bottom. The bottom plates are bolted in place and in case of appreciable wear new ones can readily be substituted. Angles 4 x 3 x $\frac{5}{16}$ in. are

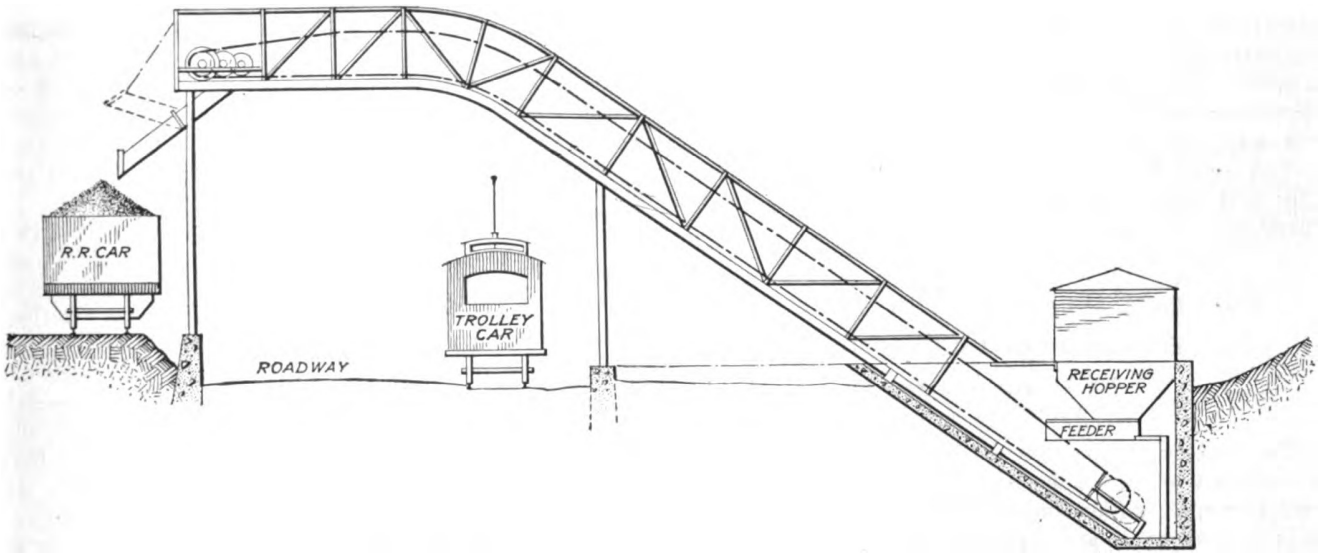
countersunk and riveted to the upper flanges of the trough channels for the chains to roll upon, also to form part of the bridge which spans the roadway. The return run of the conveyor also travels on 4 x 3 x $\frac{5}{16}$-in. angles, which serve as the upper chord of the conveyor bridge. All shafts of the conveyor were designed for both torsion and bending, allowing a combined unit stress of not over 11,000 lb. Bearings are of the rigid babbitted type, fitted with compression grease cups.

A 10-hp., 1100-r.p.m., Westinghouse, constant-speed, continuous service, open-type motor is connected to the conveyor countershaft by means of a cast-iron cut spur gear and brass-bound rawhide motor pinion. A light steel-plate motor box was used to cover the motor and automatic starter, while gear guards of the same material surround all gearing to protect the attendant.

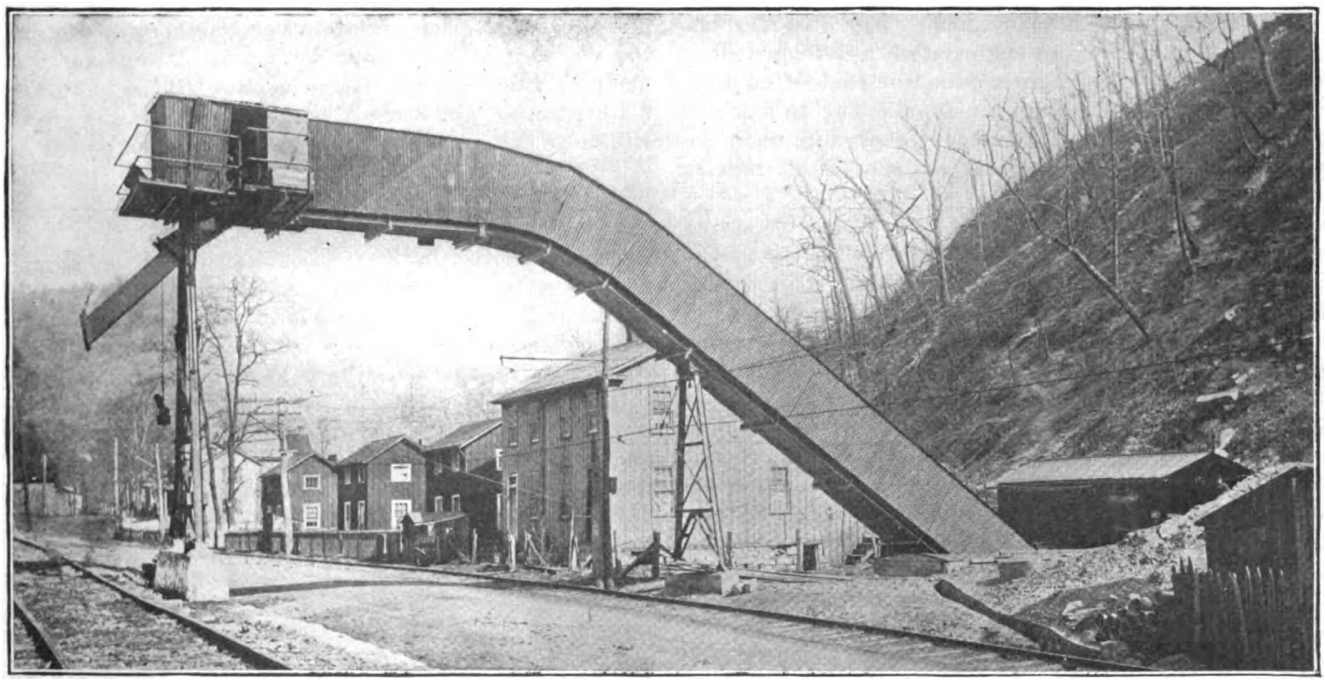
Push-button stations for controlling the conveyor are located at the conveyor receiving hopper, at the discharge chute and at the mouth of the mine. The conveyor carries the coal up an incline of 30 deg. and horizontally over a highway at a clearance height of 21 ft. from the crown of the road and discharges it into a chute which deposits the coal in railroad cars at the rate of 70 tons per hour. This fills the average size of car in about 45 minutes.

The discharge chute is 18 in. square, built of $\frac{1}{4}$-in. steel plate, and is hinged to fold up in order to give necessary railroad clearance. An ample counterweight is provided so as to make the raising and lowering of the chute simple and easy.

From the ground a footwalk 24 in. wide, built of 2-in. plank, is provided extending up the incline and along the horizontal portion of the conveyor on one side. Wood cleats are furnished on the inclined portion to assist the attendant in walking up. A platform is provided around the driving machinery to give easy access to the lubricating grease cups. A double run handrail 42 in. high, built of 1$\frac{1}{4}$-in. black pipe, incloses the footwalk and



CROSS-SECTION OF THE RECEIVING HOPPER AND CONVEYOR LINE



SIDE VIEW OF TIPPLE, SHOWING ITS GREAT SIMPLICITY

platform on the outer side. This layout shows what can be done for the small operator who is at all times hard pressed for labor to transfer coal from mine cars to railroad cars. The equipment would be even less expensive if there were no highway to carry the material across, and it was only necessary to elevate the coal to railroad cars. Again, if the cars are far away, it is an easy matter to lengthen the conveyor and supporting bridge.

If it is desired to screen the coal before loading it for shipment, the trough bottom plate may be perforated to the desired size and all material passing through the screen plate would enter a screenings hopper from which it would be drawn by a gate at the bottom. A screen of this type can also be arranged in the chute to the railroad cars, this being a favorite method of finally screening all breeze from coke before it goes to the ultimate consumer.

Many modifications of a plant of this type can be worked out and all be thoroughly practical. It is therefore believed that the small operator will soon appreciate the opportunity for mechanical handling equipment for coal after it has reached the mouth of the mine. This will relieve a large number of men for work in the mines themselves, or at some other place where they are more urgently needed.

The complete equipment described was furnished by the R. H. Beaumont Co., of Philadelphia, Penn., which specializes in coal, coke, and ash handling equipment.

Educating the Small Mine Owner to the Value of Engineering

By O. H. Hampsch
Washington, D. C.

The matter of engineering in small mines is often a neglected factor. I say small mines, for most of the larger companies have one or more engineers whose work it is to look after and solve the engineering problems that arise. But by many of the smaller companies it is deemed an unnecessary luxury to hire an engineer.

It is quite true that many small companies may not be justified in keeping an engineer when development is slow and a small tonnage is produced, but often such companies may jointly keep a man, allotting so much of his time to each mine (this amount depending upon the speed of development) or using his services at regular intervals.

The value of keeping entries and rooms on sights needs no argument, for I think anyone will agree that it is worth the time and money spent. Such a procedure results not only in maximum recovery, smaller air resistance and compactness of mine workings, but regular and even pillar supports tend to lessen squeezes and loss of territory and increase the value of a mine. One's opinion of crooked entries and diverging rooms in a mine is the same as his opinion of a town or city with crooked and winding streets and lots to correspond. Many operators consider the state survey that is required by law annually or semi-annually a sufficient amount of engineering, and many would not do even this if it was not compulsory. This reminds one of surveying a railroad after it is built.

In most cases the majority of these problems are taken care of partly by foremen in charge with the aid of a Brunton pocket compass. This is wholly inadequate for accurate work because of rails, pipes, cars, etc., which in every case will cause an erroneous reading or bearing and render it impossible to run straight entries or compute with accuracy the distance to a boundary line. Accurate transit or vernier surveys of a coal field, and tied to a complete underground survey, is the only kind that should hold in a dispute or lawsuit over boundary lines of relative location of underground workings. Many a mine owner has been agreeably or disagreeably surprised to find just where he actually is, often having mined for several years as a mole burrows through the earth, taking the line of least resistance. The cost of an encroached property or a lawsuit springing therefrom, not considering the ill feeling between land owner and operator, would often pay for the services of an engineer for a year or more.

On main entries and other passages where haulage is continuous or heavy, profiles should be run and plotted. From these the exact locations of hills or sags in the road bed and necessary cuts or fills for an ideal grade can be determined. This is quite a factor in haulage and amounts to much, whether the haulage be by mule or motor power. The user of profiles where entries are wet or water flows is of considerable value for ditching or determining the location of pumps and sumps. Often by careful grading a gravity flow can be obtained.

Entries driven off main entries or at a point where two entries diverge should be started on a curve ranging from 50 to 150 ft. in radius, depending upon the speed and kind of haulage. This eliminates considerable friction, makes an easier pull for haulage power and decreases the danger of loaded cars leaving the tracks. Care should be taken as the underground workings progress to watch the location of wells, springs, creeks, etc., especially when there is but little cover overhead, in order that these do not affect the mine through leakage; also the location of important or heavy buildings, railroad tracks and the like, leaving, if necessary, a reserve block of coal to support them.

I believe that as mineral rights become more valuable and efforts are made to improve the methods of mining, the value of starting and developing a mine on well planned, sound engineering principles will be more and more realized; and the day will come when an engineer will be as necessary to a mine as to a railroad or city.

Antiseptic Value of Peat

Peat produced by the decomposition of sphagnum moss is so antiseptic and absorbent that it is used as a dressing for wounds and is an excellent substitute for medicated cotton. This fact was recognized many years ago in Europe, where sphagnum peat is now extensively used in preparing surgical dressings. According to Professor Soper, who has made a detailed study of the peat deposits in northern United States, there are many square miles of sphagnum bog in the northern counties of Minnesota, Wisconsin and Michigan that would supply material suitable for antiseptic applications. It will not be necessary to incur the expense of deep excavation, for immense quantities of sphagnum can be taken from the upper parts of the deposits. Sphagnum peat is also abundant in Maine, and some is found in New York and Pennsylvania.