

material drops to an elevator which elevates it to mixer No. 1 standing 10 feet above the ground.

This plant is a double unit plant run by two separate engines using only one hot melted pitch tank for feeding the mixers. There are six mixers to each unit. They are all practically alike with the exception of a slight difference in pitch and shape of the blades in the different mixers. These mixers were first designed to use fuel oil for heating, allowing the products of combustion to pass through the coal; but it was found, before this plant was contracted for, that the cost of fuel oil would be about 14 cents per gallon in Alberta. Therefore a coal burning furnace was installed instead.

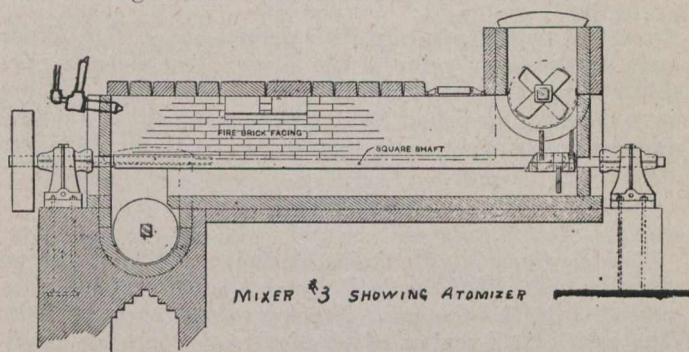


FIGURE 2.

It might be further said that these mixers are similar to concrete mixers. They are run at such a speed as to practically keep all the coal in suspension above the centre of the shaft of the mixer, and by passing the products of combustion directly in through the coal dust, the most efficient arrangements of imparting heat to coal are obtained. On account of the low specific heat of coal this step is necessary.

Mixers Nos. 1, 2 and 3, are used principally for drying and heating the dust, which must be brought up to a temperature of about 300 degrees F. At the lower end of mixer No. 3, the pitch is introduced. A section of

Mixer No. 3 is shown in Fig. 2. With some change in the style and shape of the hardened steel blades, the other mixers are similar to this.

The pitch is delivered to this mixer by means of an atomizer as shown in Fig. 3. The object is to atomize the pitch into a vapour as it were, and have this vapour pass through the suspended material as it is kicked up by the mixer shaft with its blades, thereby coating each particle of the coal evenly.

If this theory had been correct there would have been no need of any additional mixers, as the coal would certainly then be in proper condition for briquetting. Early experiment with this apparatus brought out the fact that additional mixers are required after the pitch is introduced in order to make a thorough mixture, and one after another was added, until six mixers were placed in series. It was found advisable in plants erected in the United States to put in a type of pug mill blades in mixer No. 5, so as to break and spread out the balls formed by the pitch rolling in the dust.

Mixer No. 6 is only used for cooling the mixture, as it would be too hot to put in the briquetting press and make hard briquettes. In this mixer it is advisable to introduce a little hot water as the briquettes are in better shape when the mixture is slightly damp.

In order to make a good hard briquette of any coal it is absolutely necessary that the surface of the particles of coal dust be dry so as to allow the pitch to properly adhere to it. It may appear, if pitch is introduced into wet coal dust, that there is an adhesion, but it is so small that it makes briquettes weak and liable to disintegration in handling and during combustion, owing to steam being generated in the briquette.

It has been found by experience that if there are a sufficient number of mixers and the material is brought up to the proper temperature it is immaterial whether the pitch is atomized or just pumped in straight through a distributing pipe. In fact, in a plant running at a rate of about 12 tons per hour, the stream of steam from the atomizer enters the mixer with such force and in such

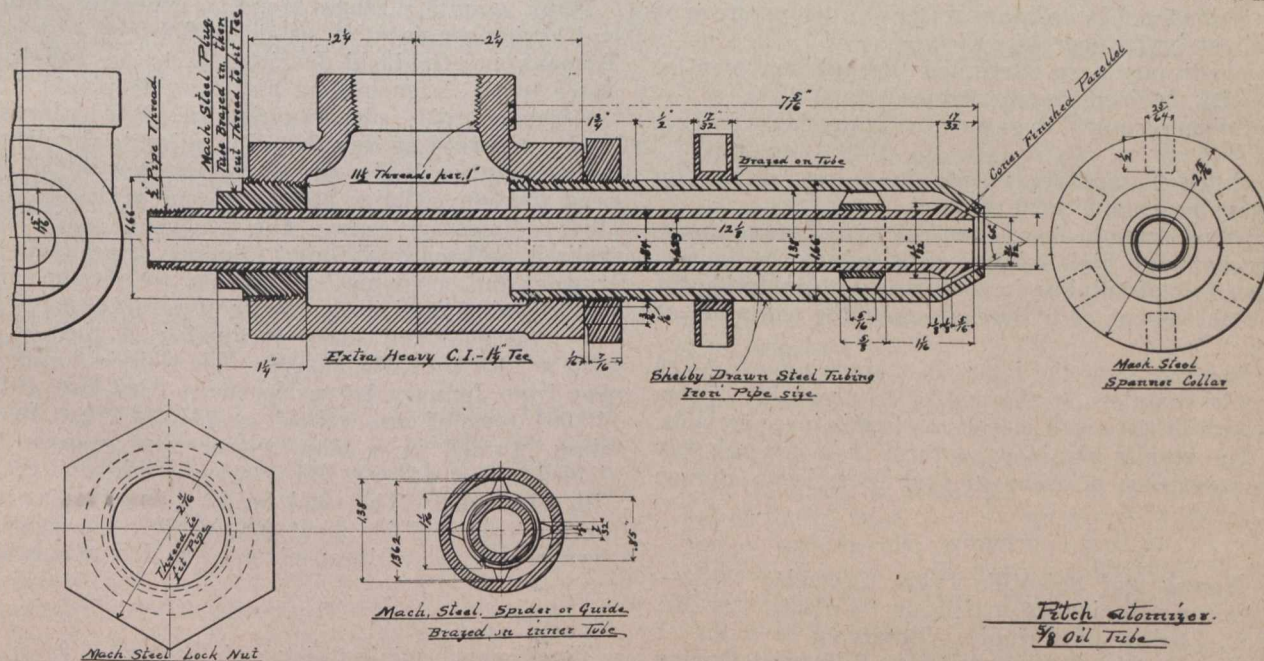


FIGURE 3.