materials such as coal, moulding sand, etc. You will doubtless be interested in knowing how the spiral conveyor is supported in the trough. The ends are supported by solid end bearings which fit into the end of the wood or steel box and with each length of conveyor a bearing is supplied which fits over the box and hangs down sufficiently far to allow the conveyor to clear the lining and no more. The clearance for ordinary work is about $\frac{1}{8}$ inch. For discharging out of the end of the trough a discharge end bearing is used. This has an opening through which the material is forced. For discharging at intermediate points through the bottom of the trough ordinary slide or hinged valves are used.

Spiral conveyors generally run at 75 to 300 revolutions per minute according to the material being handled and can either be driven straight off a driving shaft or at right angles by means of a counter shaft box end which consists of a box end with a pair of mitre gears to drive at right angles to the conveyor all contained in a solid iron frame. These conveyors are made right and left hand and in this way can convey material in either direction.

I think I have touched on the conveying field rather fully. We will now consider appliances for elevating materials.

We will first consider the bucket elevator. You all are familiar no doubt with an ordinary belt to which are attached buckets at regular intervals, used principally in flour mills. Their use is now extending to almost every industry where granular materials are being handled.

There are many styles. Oftentimes the material being handled will injure a belt. In such cases some style of sprocket chain is used. Ordinary detachable sprocket chain was at one time popular, but is now gradually being replaced by more permanent styles of chain. Detachable chain has an open joint into which gritty materials work and abrasion quickly wears out the joint. A better style of chain is what is known as Hercules chain. This consists of a solid malleable link with steel side bars, is much stronger than detachable chain and the material being handled cannot work into the joint. Bucket elevators are made to handle all capacities—as small as with a 2 inch by 2 inch bucket to handle a fraction of a ton an hour up to 5 feet by 3 feet bucket to handle 400 tons of crushed rock per hour.

A bucket elevator consists of a head shaft running at thirty-five to forty revolutions per minute; a wood, cast iron or steel boot with takeups and foot pulley or sprocket over which runs the belt or sprocket chain with buckets attached either at intervals or continuously as the case may be. The material is fed into the boot through a regulating gate and the buckets elevate up to whatever height is required and