

vided with two threaded portions of different diameters, the smaller size on each being right-handed and the larger left-handed. The inside of the bushings is tapped to fit the left-handed thread; while the outside of the bushings is cut right-handed, of the same pitch as the smaller diameter threads at the end of the binding screws, to enable the same to be screwed into place. The operation of the device is obvious, and it will be noticed that when slackened the binder is positively forced open.

To provide for the slackening of the spindle belt when the grinder head is elevated, an automatically adjusted belt tightener is arranged on the regular five-speed countershaft which accompanies the machine. The countershaft and tightener are shown in Fig. 3, and further details of tightener are illustrated in Figs. 4, 5 and 6. A weight *Q*, by force of gravity, maintains the proper tension of the driving belt at all times. A notable feature of the belt tightener lies in the construction of the pulley *T*, which is rigidly mounted on a shaft *U*, the shaft having a bearing in a hub on the tightener arm. This pulley is so constructed that the belt pull is over the centre of the shaft bearing. The shaft is oiled at the centre, and the whole arrangement goes far to overcome the objectionable features of the ordinary loose pulleys. The drip cup *W* is hung in a groove on the tightener hub, and will maintain its contents inside the cup no matter what the angle of the arm may be. The machine is manufactured by the Norton Emery Wheel Co., Worcester, Mass.

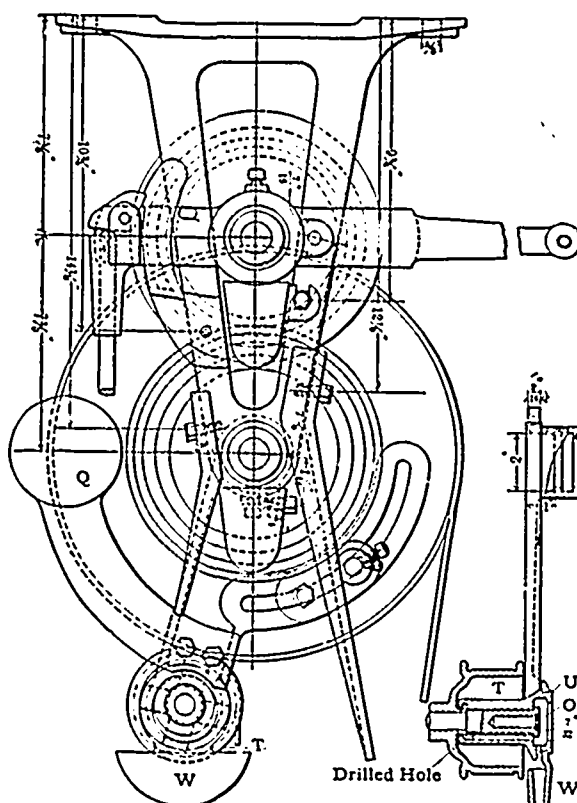


Fig. 3

COUNTERSHAFT WITH TIGHTENERS.

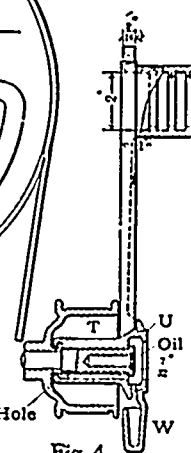


Fig. 4

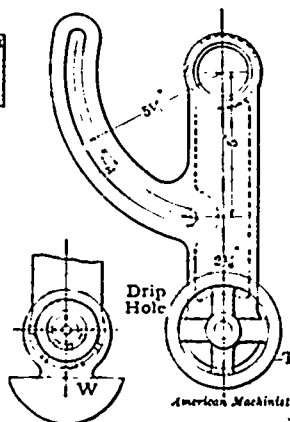


Fig. 5

American Machine

Fig. 6

BELT TIGHTENER AND DRIP CUP.

THE NEW CROCKER TURBINE.

It is manifest that the evolution of the turbine is keeping pace with advance in other lines of mechanical art.

A decade ago iron wheels were frail in construction, of small capacity, and uncertain in results. A glance at any old water wheel catalogue will reveal the progress. A thirty inch runner was tabled to develop, say, fifty h.p. under twenty foot head; the modern turbine gives nearly three times this power, and the efficiency has been raised from fifteen to twenty per cent. also.

These important results have been realized by men of natural talent, aided by practical experience gained by close observance of the results attained by the various types of wheels in use.

It is a curious feature that no turbine of purely mathematical or scientific origin has held for any considerable length of time a place on the market. The horizontal system of installing turbine plants is highly successful. Under more than moderate fall this is undoubtedly the most desirable plan. The removable step-socket now used with vertical wheels has, however, greatly lessened the difficulties experienced heretofore with that mode of setting. The turbine style furnished the most economical power and

tries of to-day. The runner, or wheel proper, is a model of design and scientific construction. It unites ample strength in a union capacity, and the highest efficiency obtainable. The gates and chutes are so formed and secured to the casing as to be easily operated, even under high heads, which admits of perfect regulation by an ordinary governor.

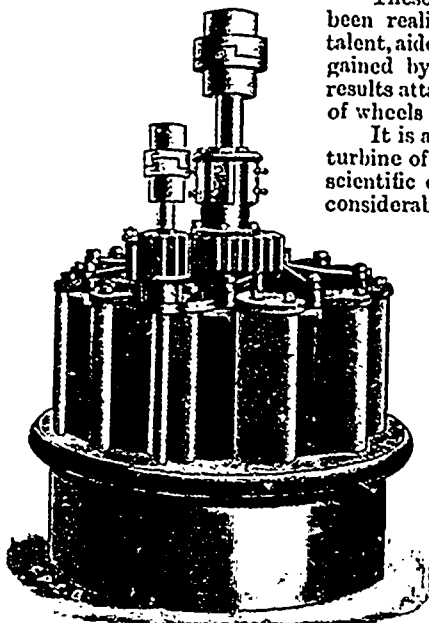
The surface formed by gates and chutes introduce the water to the wheel in solid streams the full height of bucket, thus producing high part gate results and uniform speeds under variable conditions.

Every particle of water is directed onto the buckets, there is no leakage through the crown plate to the wheel vents, which always occurs when cylinder gates are used.

The makers solicit a close examination of this turbine, feeling confident that it will bear the most critical tests.

The illustrations herewith presented give a fair idea of this machine, further particulars of which are set forth in the business card of the Jenckes Machine Co., of Sherbrooke, Que., who are the Canadian manufacturers of it, and who will give all information on application.

Some of the recent sales of the Crocker Turbine are to the Lake Megantic Pulp Co., six wheels; to the North Shore Power Co., four wheels, the Chicoutimi Pulp Co., three wheels; the town of Drummondville, Que., one fifty-five inch wheel for electric lighting purposes; the Boston Rubber Company, Montreal, one wheel; the Royal Paper Mills, Compagny, East Angus, Que., one wheel; the J. Champoux Lumber Company, D'Israeli, Que., two wheels.



the greatest percentage of the force expended. With it, electrical energy can be generated at the lowest possible cost. Thus, every water privilege having reasonable constancy, is destined to become valuable and available for the development of local or distant enterprise.

The subject of this article, "The Crocker Turbine," embodies all the desirable characteristics required in the diversified indus-

