

MASTERSUN'S CANADIAN TURBINE.

Our engraving illustrates a very ingenious invention, lately patented in the States, by Mr. W. G. C. Mastersun, of Hinchinbrook, Huntington Co., Province of Quebec. By various skillful devices, which we shall describe, he supports a water wheel and chute independently of each other, but in such a manner as to allow of their both being raised by a float, so as to do away with the use of a step. He further arranges the buckets and outside rim of the water wheel so as to form receptacles for the water in corners situated beyond the outlet slots of the rim. The water driving the wheel is thus provided with water cushions to bear against and the motion of the wheel is rendered steady and continuous. Another prominent feature of the invention is a self-acting gate for the water outlet.

Fig. 1 is a perspective view of the complete apparatus, showing the water gate alluded to, fully raised. Fig. 2 is a sectional elevation of the same, with the gate nearly closed. A is a water cylinder on which are supported, by the legs, B, the cylindrical air chamber, C, and the inner cylindrical water tube, D. E is a horizontal pipe, through which the water is supplied. F is the water wheel, which consists of a disk-like plate at the bottom, an annular plate at the top (between which plates the buckets are inclosed), and an outer rim, slotted to discharge the water, as shown in Fig. 3. By means of the bottom plate it is mounted on the shaft, G, in the manner shown at Fig. 3 which represents a detail section of the hub. The shaft, G, extends upward through the long tube, H, and carries the driving pulley, I, at its top. The upper end of the tube, H, is screwed into a nut which rests upon the bottom of a cup or chamber placed upon the top of the water tube, D. The shaft, G, passes through this cup and carries over it a collar which bears against friction rings placed within the cup. The whole of this arrangement is shown in detail in Fig. 4. The lower end of the tube, H, carries the chute, J, which is contained within the annulus of the wheel, F. There are plates in the chute which run in the same direction as the buckets in the wheel, and which guide the water into the corners formed in the buckets before alluded to. From the bottom of the water wheel is suspended an air vessel which is shown at K.

The operation is as follows. The water received from the

supply pipe passes down the water tube, D, through the chute, J, into the buckets of the wheel, F, and forces the air contained in the tube and wheel into the air chamber, C, where it reacts on the water and gives additional pressure upon it in the direction of the water outlet, which is formed by the flaring mouth of the gate, L, and the slanting top of the

run off into the gearing, or by being caught in any manner so as to damage the edge, or by stoppage of either the driving or driven pulley. A few moments of quick motion or friction will roll off the gum from the canvas in such quantities as to spoil the band, while leather belts may be torn or damaged, yet are easily repaired.

Should a rubber or gum belt begin to tear by being caught in the machinery, if the rent strikes the seam, it is most certain to follow it, even the entire length, if the machinery is not stopped. It would be impossible to tear leather in like manner.

Oil in contact with rubber belting will soften the gum and rubber, gutta percha, and canvas belts will continue to stretch as long as in use, rendering it necessary to shorten them continually.

During freezing weather, if moisture or water finds its way into the seams, or between the different layers of canvas composing these bands, and becomes frozen, the layers are torn apart, and the band is spoiled; or if a pulley becomes frosty, the parts of bands in contact with it will be torn off from the canvas and left on the pulley. Also, gum belts will not answer for cross or half cross belts, for shifting belts, cone pulleys, or for any place where belts are liable to slip as friction destroys them.

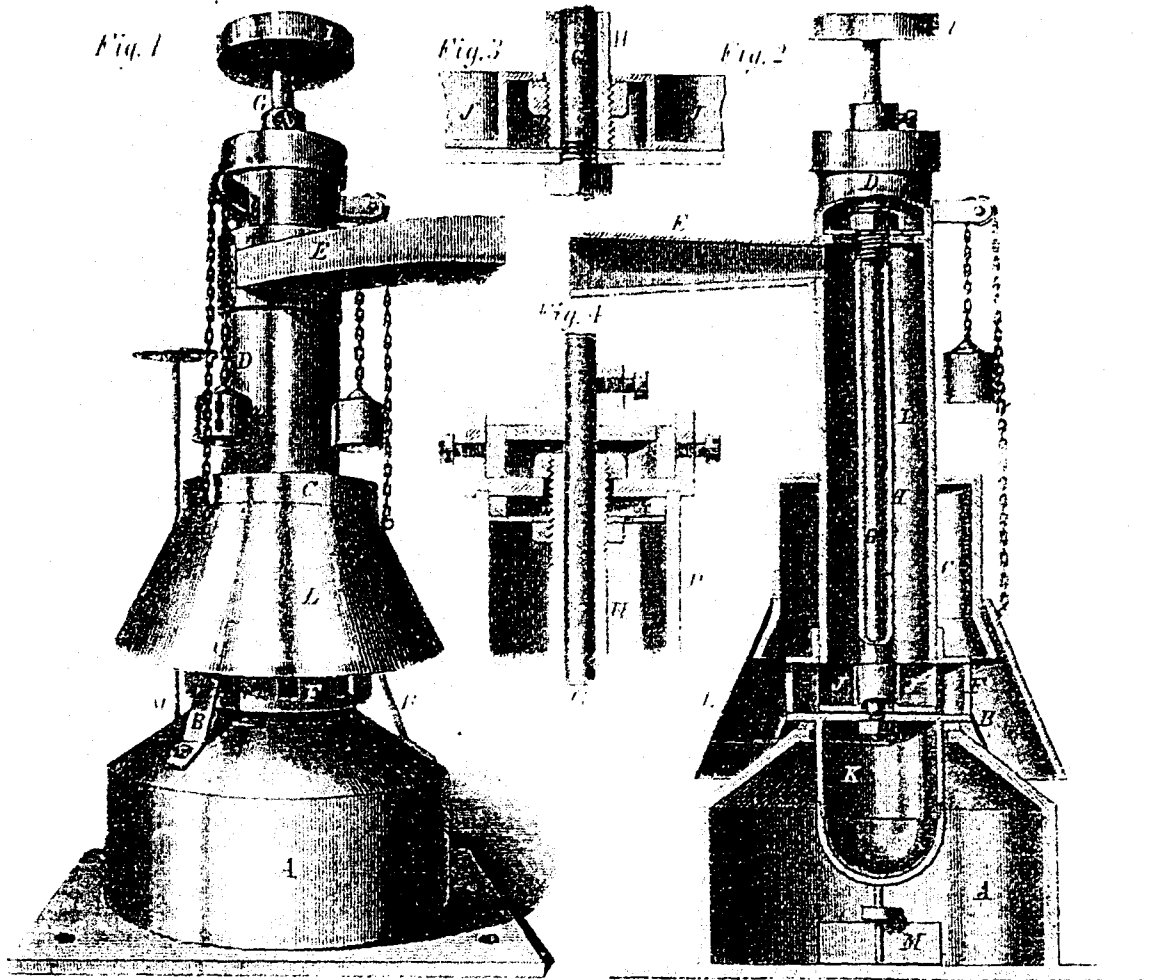
A well made leather band, if properly looked after—the width and pulley surface proportional to the amount of work to be done—will last twelve, fifteen, or twenty years, and yet be of value to work over into narrow belts.

—Scientific American

OXYHYDROGEN STREET LAMPS.

—Within the past few weeks the New York Oxygen Gas Company has extended pipes from their works in Eleventh avenue, corner of 41st street, to and through 23rd street to the plaza formed by the intersection of Broadway, Fifth avenue, 23rd and 24th streets, where they have erected large and beautiful chandeliers for the display of their new and splendid oxyhydrogen lights. The exhibition is a most gratifying success. The whole square is magnificently illuminated at night. The plaza is an excellent locality for showing the invention, as it is one of the most prominent places in the city, crowded at nearly all times with pedestrians and vehicles. The light is presented in the form of intense white tufts of flame, which burn very steadily and yield most brilliant illumination, imparting a cheerful radiance to every object in the neighbourhood, bringing out the natural colours almost like sun light. The company is now in readiness, we understand, to contract for the lighting of all the streets by this method. We need hardly say that its general introduction for this purpose would be a great public improvement. Our streets, thus lighted, would be rendered attractive and safe. Men who love darkness because their deeds are evil would have to emigrate to places where oxygen lights were unknown. A single jet of the new light is alleged to be equal in illuminating power to sixteen of the ordinary street gas jets. When the two lights are placed side by side, the common gas flame looks exceedingly poor and dingy.

—Scientific American



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water cylinder, A.

The top of the water cylinder, A, is open. It is provided at the bottom with a pivot gate shown at M. Before escaping through the gate, L, the water rises in the cylinder, A, and by floating the air vessel, K, supports the chute, water wheel, and shaft. On making its escape, the water raises the gate, L, which is balanced by weight as shown in Fig. 1, to a height proportionate to the power exerted by it. By varying the area of the water outlet, by means of this gate, the power of the wheel is regulated.

The use of the water support in lieu of a step, and the provision made for water cushions in the buckets of the wheel must result in very easy motion and place the wheel under complete control. For convenience, should repairs become necessary, the chute is constructed so that it may be raised in the water tube above the inlet; thus allowing room for a workman to descend the tube and do what may be required.

—Scientific American.

REVERSIBLE WATER FILTER.

A filter that cannot be reversed, and thus made self-cleaning, is not worth much. A filter that does not allow the filtered water to rise, instead of falling, into the pure water chamber, is imperfect.

The accompanying engraving represents a filter adapted to all the purposes for which filters are used, which is essentially a self-cleaning filter, in which the water leaves all its sediment behind as it bubbles up into the pure water chamber in the centre of the filter. The filter is supported on central trunnions in a wooden frame, and is turned, end for end, by simply detaching the supply pipe. The valves act by their own gravity as the filter is reversed. The perforated heads, which confine the filtering material and secure the central cylinder, are loose disks held in place by the outside heads.

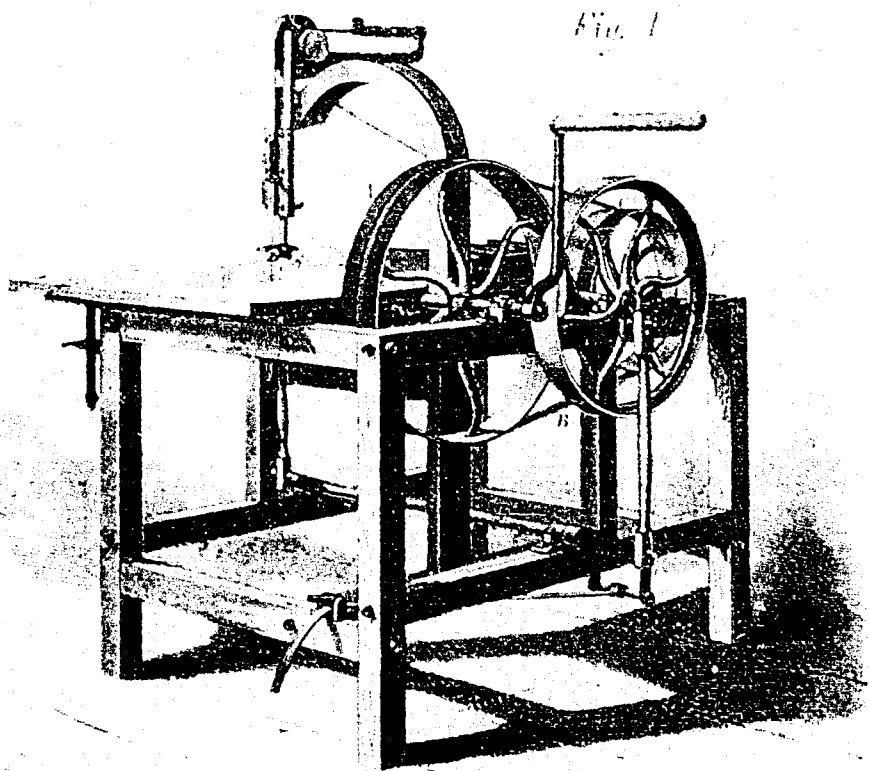
—Scientific Am.

RELATIVE MERITS OF RUBBER AND LEATHER FOR BELTS.

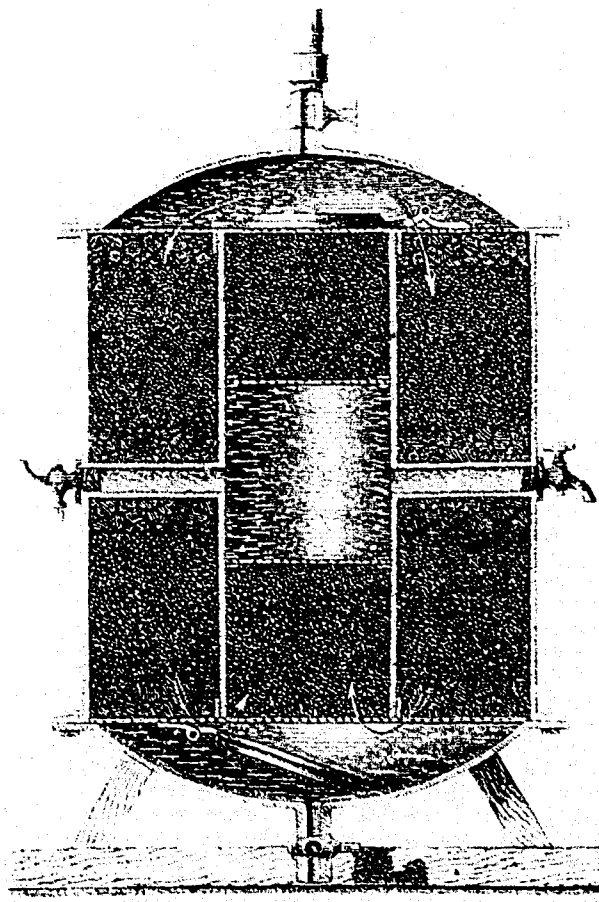
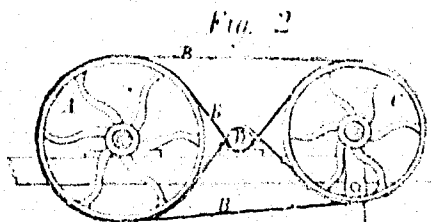
Rubber will not last one fourth as long as leather. When once it begins to give out, it is next to impossible to repair it while wide bands cannot be used for or cut up into narrow ones, as leather ones can be.

Leather belts may be used over and over again, and, when of no further value for belts, can be sold for other purposes.

A rubber band, costing hundreds of dollars, may be spoiled in a few moments by the lacing giving out, and the band being



WEAVER'S SAWING, BORING AND PLANING MACHINE.—SEE PAGE 90.



REVERSIBLE WATER FILTER.