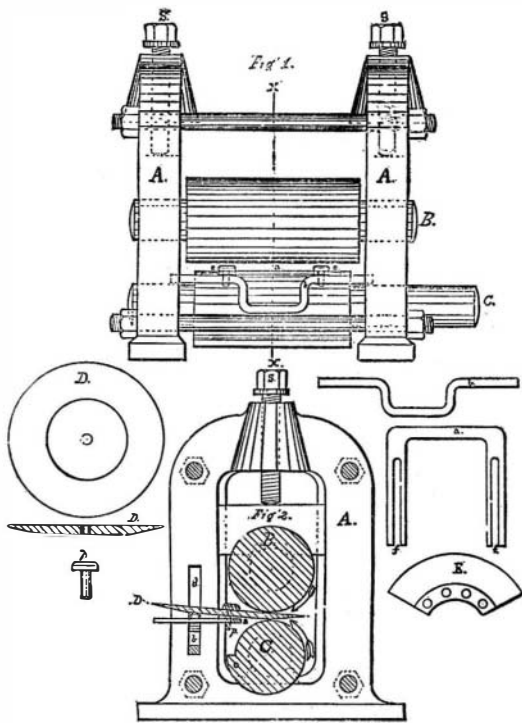


## IMPROVEMENT IN ROLLING MILLS.

By J. JEPSON, Philadelphia, Pa.

THE object of this invention is to roll circular plates with a bevel on one side, gradually decreasing the thickness from a centre circle to the edge such plates being used in the manufacture of shingle and veneering saws, which, previous to my invention, were rolled of one thickness to the edge, and the metal ground away to form the bevel, which is a waste of metal, an expense, and loss of time.



IMPROVED ROLLING MILL.

Fig. 1, front view of a pair of housings and rolls. Fig. 2, sectional side view of the same on the line *x x*.

A, housings, constructed as usual. The bearings for the top roll B are supported by springs, or they may be supported by a weighted lever, as is frequently used. The roll B is made of a true circle. The roll C is in the form of an eccentric or cam, as is shown in Fig. 2. *b* is a rest which is fixed in a slot, *a*, in the housings A. To this rest is fixed, by two screw bolts, *e e*, Fig. 1, the stop-gauge *a*, which is adjustable by means of the slots, *f f*. D represents a circular plate or disk with a bevelled edge, as is required for a shingle-saw. In the centre of the plate D is a hole, into which fits a loose pin, *p*. E represents a segment plate, such as is used to make veneering-saws. This segment has a number of holes, into which the pin *p* will fit.

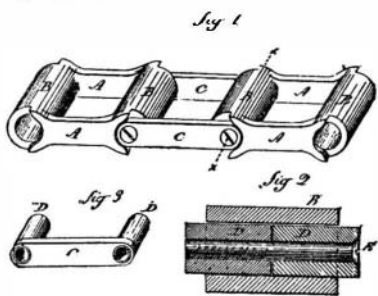
The plates and segments have previously been rolled to their proper thickness for the centre of the saw. A hole is drilled or punched in the centre for the pin *p*, and, in case of a segment, it is cut to the proper shape, and the number of holes desired are drilled or punched for the pin or pins. The plate is then heated to a red heat, the operator grasps it with a pair of tongs, and rests it on the heads of the screw-bolts *e e* and guide *a*, when the pin *p* is dropped in the centre hole, and the plate is pushed between the rolls till the pin *p* is stopped by the guide *a*. Power being applied to the roller C, it revolves in the direction of the arrow, and the edge of the plate being pressed between the two rollers it will be forced towards the operator, and the plate will be drawn down gradually to the edge, it being turned around by the operator, presenting a different part of the plate for each operation, gradually feeding the rolls closer together by means of the screws *s s*, and the plates will be rolled or drawn to the form, as is shown in the drawings.

It will be noticed that the bevel is all on one side of the plate, which bevel is formed by the bottom roll, and adjustment of the stop-guide *a*.

## IMPROVEMENT IN CHAIN-BELTS.

By H. BUSHNELL, New-Haven, Conn.

CONSISTS in constructing one link with tubular transverse bars; the next link, or sides of the link, with studs, to enter the said tubular bars.



IMPROVED CHAIN-BELTS.

A, sides of the principal links connected by tubular bars B, the sides and the bars being cast in one piece; C the sides of intermediate or connecting links, each constructed with a stud, D, at each end, as seen in Fig. 3, to enter the tubular bar, the studs being about one half of the length of the tubular bar, and the sides C preferably in line with the sides A, by making an offset on the end of the tubular bars, as seen in Fig. 1. The bars C are preferably secured together by passing a screw or bolt, E, through one to the other, as seen in Fig. 2, the side C and studs formed in one and the same piece of casting. By this construction the bars B are of convenient form for engaging with the teeth of the wheel, and the connections formed between the principal links by means of the studs D, formed on the sides C, are very much stronger than can be made by simply connecting the opposite sides C by a bolt through the bars without the studs, as in this case no strain whatever is brought upon the bolt—it simply secures them in position; and the chain is of very cheap construction, there being but little mechanical labor required in connecting the parts.

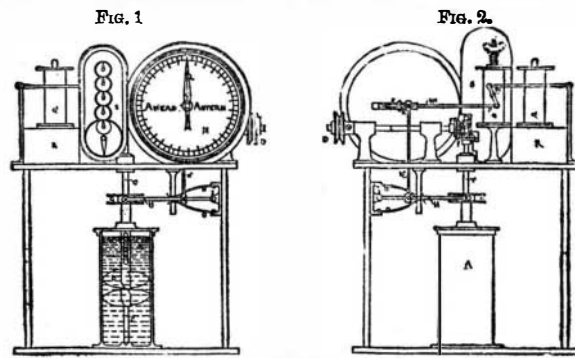
## IMPROVEMENT IN SPEED-INDICATORS.

By M. A. WIER, London, Eng.

THE invention has for its object the production of an apparatus which shall indicate, and if needful record, automatically, the speed or number of revolutions in a given time, of prime movers, machinery, and other moving objects, in such manner that the said speed or number of revolutions can be ascertained by simple inspection, and without counting or reference to a time-piece.

Fig. 1, front elevation. Fig. 2, back elevation.

A is a cylindrical vessel containing glycerine and water. B, fan or screw, capable of sliding on the axis C, but constrained to turn therewith by a feather. Motion is imparted to the screw B from the revolving object, the speed of which it is desired to ascertain, by a band passing over pulley D on the axis E, which drives the axis C through the mitre-wheels F. G is a double collar on the fan or screw; H, a lever, centred at I, and having a forked end, which takes between the flanges of collar G. A link, H', connects lever H to a lever, H'', which has fixed to it the sectoral toothed rack J, gearing with the pinion K on the axis of the pointer L, arranged to move over the graduated dial-face M. The levers H H' and fan or screw B are held, when the latter is at rest, in a normal position, by the springs N O, the pointer L then standing at zero on the scale of the dial-plate. It will now be understood that, rotary motion being imparted to the fan or screw B in one direction, the resistance of the liquid to the motion of the oblique blades thereof will cause it to rise in



IMPROVED SPEED-INDICATOR.

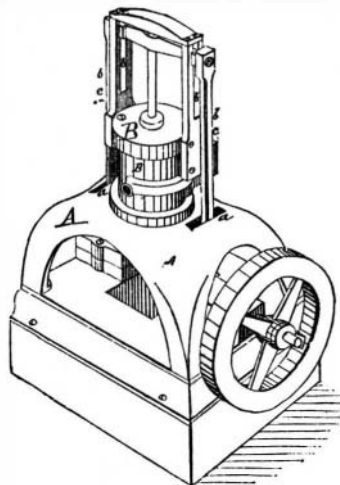
the vessel A, and, by the double collar G, to raise levers H H' and sectoral rack J, turning the pointer in one direction, and to an extent proportionate to the speed of rotation of the screw, and consequently of the object by which it is driven. If the driving object is made to revolve in the opposite direction, the screw and levers are depressed, and the pointer L also turned in the opposite direction, the scale on the dial being suitably graduated, and marked in both directions from the zero-point, the number of revolutions in a given time may be ascertained by simple inspection, as also the direction in which the object may be rotating. The springs N and O tend to return the screw towards its normal position, and consequently the pointer toward zero, whenever any diminution of the speed takes place. When it is desired to register graphically the times, speeds, and changes of direction of motion, the lever H'' is extended, as at P, and made to carry a pencil at its end, or, preferably, in the link of a parallel motion, as shown at P'. The pencil traces a line on a sheet of suitably ruled paper wound on the bobbins Q Q', a uniform motion being imparted to the paper by clock-work contained in the case R, in the well-known manner. When the screw is stationary, the pencil traces a straight centre line on the paper. When the screw is set in motion, the pencil traces a line more or less above or below the centre line, according to the speed and direction of rotation, fluctuations of speed being shown by a zigzag line, the distances of which from the centre line, being measured on a suitable scale, indicate the various speeds, while the distance along the centre-line indicates the time.

When the screw revolves in air instead of a liquid, a similar arrangement of apparatus may be employed; but the fan or screw then requires to be made larger, and to be driven at a higher speed.

## NEW STEAM-ENGINE FRAME.

By W. S. FINNEY, Harrisburg, Pa.

A REPRESENTS the engine-frame, constructed of one piece of casting, forming a quadruple arch. The juncture of the four arches at the corners provide supporting columns of great stability, with but a moderate consumption of material.



NEW STEAM-ENGINE FRAME.

The crowns of the several arches, uniting, produce a continuous shell, spheroidal in form. The apex is flattened to form a base, upon which is mounted the cylinder of the engine, B. This is of ordinary construction.

## IMPROVEMENT IN PROPELLING CANAL-BOATS.

By A. BUGBEE, South-Bend, Ind.

RELATES to that class of vessels which are propelled by streams or jets of water discharged from the stern of the vessel into the body of the water in which it is floating.

First, a pair of turbines is fastened to a vertical shaft some distance apart, with their curved buckets in reversed po-

sitions, and operating in a chamber in the stern of the vessel. Thus arranged, the upper turbine will take in the water above, and the lower one below, and both discharge it into the space between them, from which it issues with a force proportional to the velocity with which the turbines are rotated, the downward pressure of one wheel being compensated by the upward pressure of the other, so that the shaft or spindle supporting them will not be subjected to undue wear. Second, racks upon the sides of the vessel, through the openings in which the water is drawn in by the turbines, said openings being divided by oblique plates to aid in propelling the vessel.

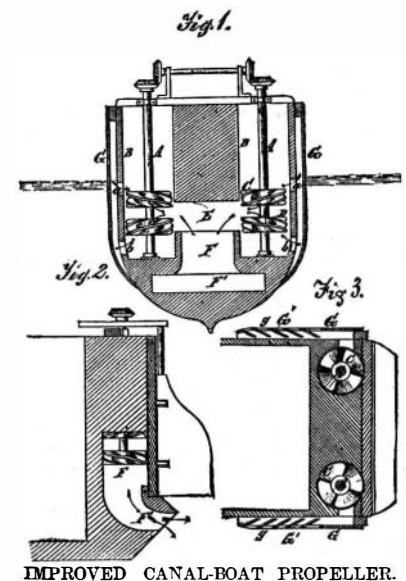
Fig. 1, transverse section through the stern of a vessel. Fig. 2, longitudinal vertical section of the same. Fig. 3, sectional plan view.

Two pairs of turbines are shown, one upon each side of the vessel. Each pair of turbines is fastened upon a vertically disposed spindle, A, which turns in a step upon the bottom of the cylindrical chamber B in the stern of the vessel, and rotated by a steam-engine.

The blades of the upper turbine C are disposed reversely to the buckets or the lower turbine D, and the shaft A must be turned so as to cause the former to take the water in above through the induction-aperture *a*, and the latter to take in the water below through the induction-aperture *b*, both turbines discharging the water into the space between them, from which it escapes through the passage E into a central chamber or cavity, F, in the stern of the boat, and issues from that through the eduction opening F' into the body of water in which the vessel floats.

Instead of taking in the water directly through the induction-apertures *a* and *b*, I prefer to cover said apertures by a rack, G, illustrated in Fig. 3, and draw the water through that. This rack is constructed with a series of vertically elongated openings, *g g*, which are divided from each other by the plates G'. The latter are arranged in oblique positions in the manner shown in Fig. 3, the effect of which will be to cause the ingoing currents of water to press upon these inclined planes, so as to assist, to some extent, in propelling the vessel.

In order to make this action of the water upon the oblique



IMPROVED CANAL-BOAT PROPELLER.

surfaces of the plates as effective as possible, the openings in the racks should correspond in area as nearly as possible with the area of the eduction-aperture. The turbines may be arranged horizontally, if preferred; and where they are to be used for propelling boats in shallow water the chamber in which they operate should be closed air-tight.

[British Trade Journal.]

## MESSRS. HADLEY BROTHERS' MITRE-CUT NAIL WORKS, BIRMINGHAM, ENG.

THE manufacture of cut nails in the great "Hardware Capital" has been carried on as a distinct branch of industry now for something like half a century. In the interim the high prices of hand-made wrought nails, and the inefficiency of cast nails as a substitute for them, has naturally stimulated the production of a variety of ingenious machines for stamping, cutting, and heading wrought-iron nails. Birmingham manufacturers were the first in England to adopt the American system of cutting nails out of cold metal by machinery. The principle and the main essentials to successful manufacture are still the same, but in certain details the machinery has undergone considerable modification and improvement. These details have reference to the simplification of parts and acceleration of speed, and in these respects the introduction of modern machinery has had an effect on the cost of production and quality of the article which are more or less advantageous to the buyers and users of cut nails. It is estimated that from 20,000 to 25,000 tons of iron are annually cut into nails in Birmingham, a total quantity equal to the aggregate production of nails of this class in all the other places in the United Kingdom. A large proportion of these nails are shipped for places abroad, especially India and the Australian colonies, and the remainder are absorbed in supplying the wants of the home trade. England bears the palm in this special manufacture. As a rule our cut nails are of very fine sample, manufacturers taking pains to select a superior quality of sheet iron, and using machinery of such precision that their nails are straight cut, well pointed and headed, and consequently English cut nails are much sought after by foreign buyers as really excellent nails for general work. The sorts of nails mostly required are—clasp, clout, and rose-headed nails, used by builders, box-makers, coopers, etc.; cut tacks, in copper, zinc, and iron (the latter are exported very largely to Russia, made up in bags containing one Russian pood, equal to 36 lbs. English avoirdupois); slate nails, in copper, zinc, and iron; joiners' floor brads, shoe nails, namely, "bills," "hobs," "tip nails," etc.

Some account of a recent visit to the cut-nail manufactory of Messrs. Hadley Brothers, the largest and most complete establishment of the kind in England, may probably be interesting to the readers of this journal. "The Mitre-Cut Nail Works," as they are called (the "Mitre" being the registered trade-mark of the firm), were built especially for the purpose, under the personal superintendence of the principals, and thus every possible requirement has been anticipated in the most systematic manner, to insure order, regularity,