(No Model.) 2 Sheets—Sheet 1.

J. S. RICHARDSON.

SPINNING MACHINE.

No. 353,377. Patented Nov. 30, 1886.

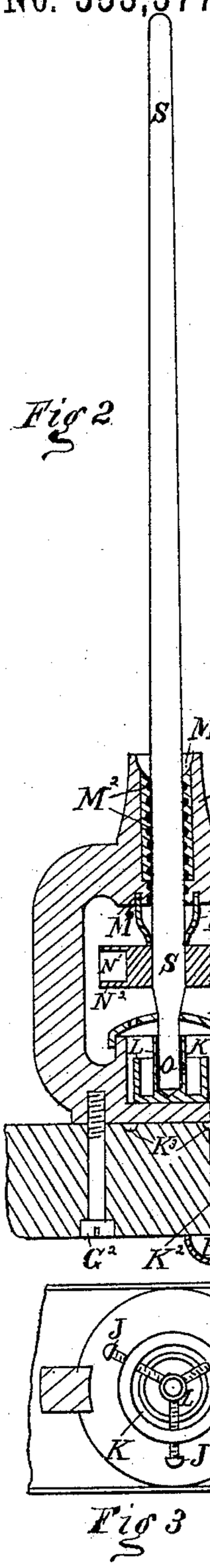

Fig 2

Fig 3

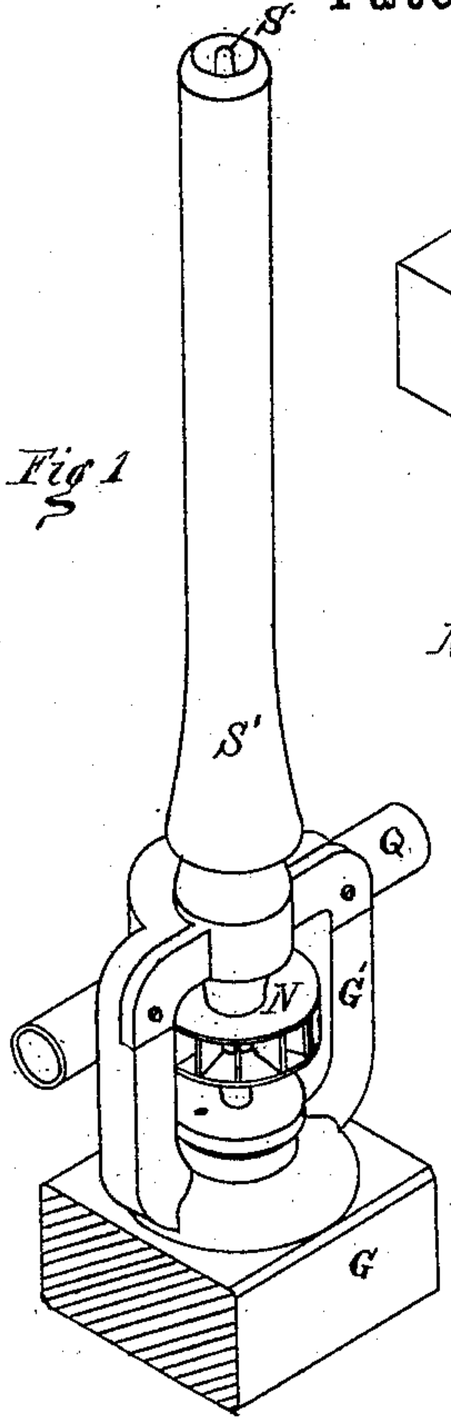

Fig 1

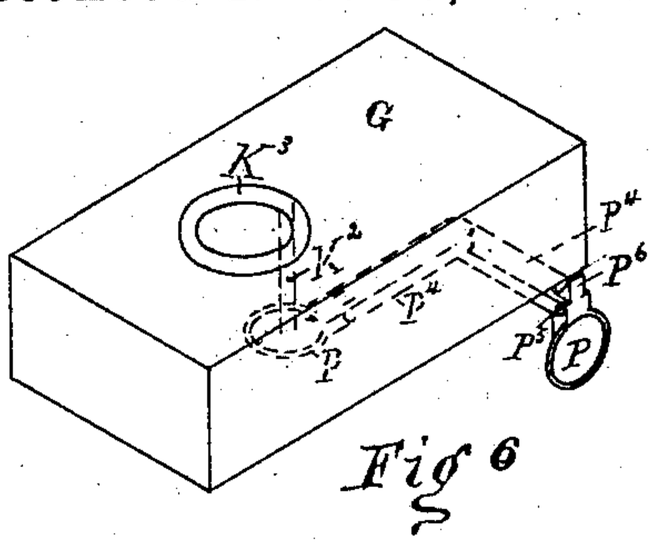

Fig 6

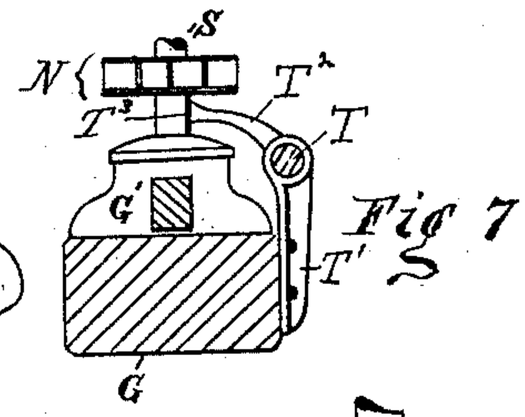

Fig 7

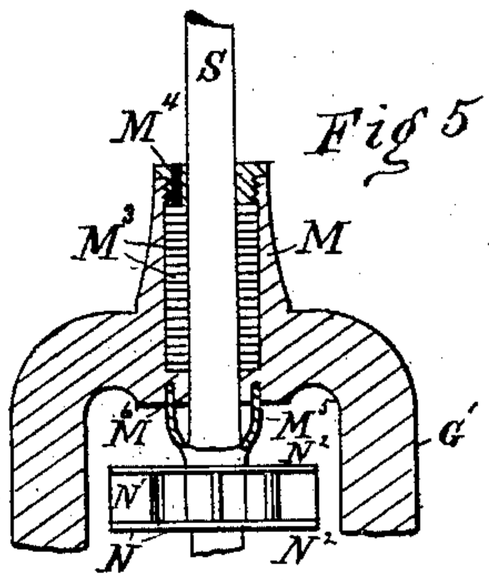

Fig 5

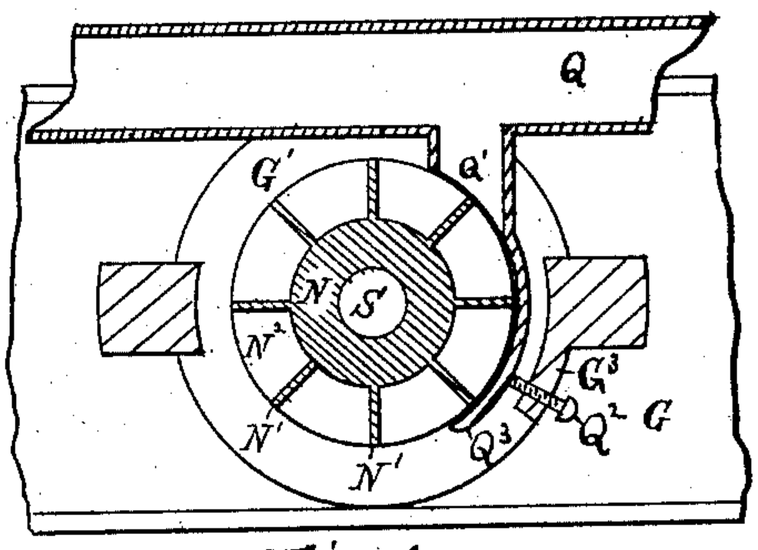

Fig 4

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By Albert M. Moore,
His Attorney.

(No Model.) 2 Sheets—Sheet 2.

J. S. RICHARDSON.

SPINNING MACHINE.

No. 353,377. Patented Nov. 30, 1886.

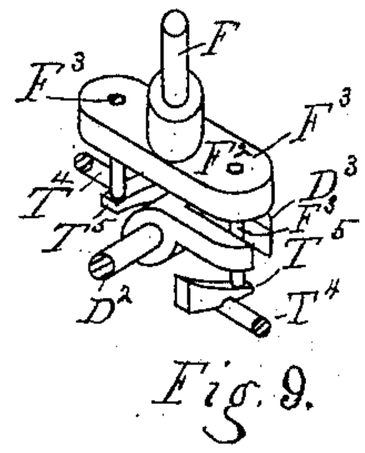

Fig. 9.

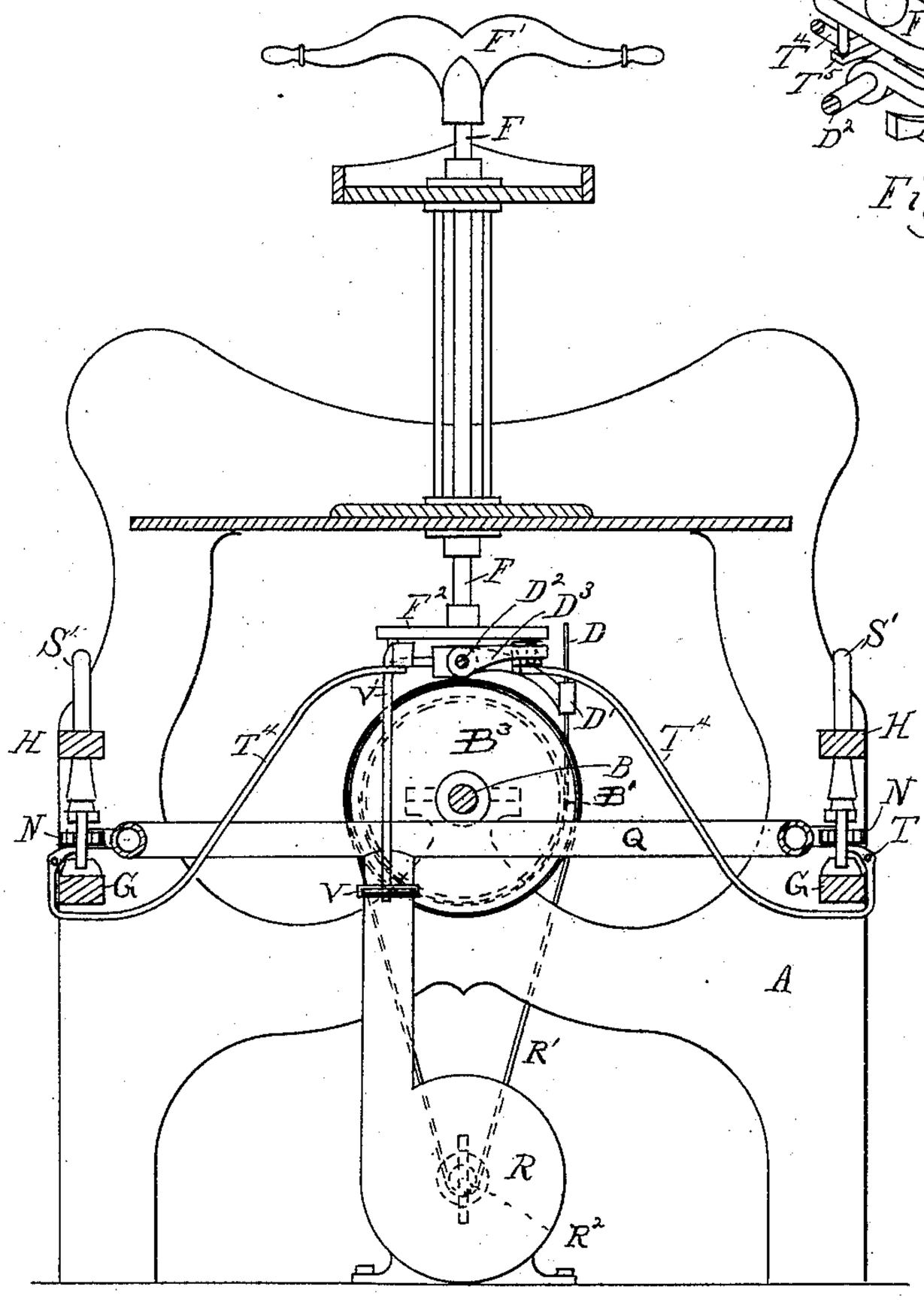

Fig. 8.

Witnesses—
Edward W. Thompson
Herbert R. White

Inventor—
John S. Richardson,
By Albert M. Moore,
His Attorney.

UNITED STATES PATENT OFFICE.

JOHN S. RICHARDSON, OF LOWELL, ASSIGNOR TO GEORGE DRAPER & SONS, OF HOPEDALE, MASSACHUSETTS.

SPINNING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 353,377, dated November 30, 1886.

Application filed July 31, 1882. Serial No. 68,100. (No model.)

To all whom it may concern:

Be it known that I, JOHN S. RICHARDSON, of Lowell, in the county of Middlesex and Commonwealth of Massachusetts, have invented certain new and useful Improvements in Spinning-Machines, of which the following is a specification.

My invention relates to means for promptly stopping the revolution of the spindles by the operation of the usual shipping devices and connecting mechanism, to means for catching the oil which overflows from the step, and to the combinations hereinafter described and claimed.

In the accompanying drawings, (on two sheets,) Figure 1 is a perspective view of a bobbin, spindle, fan-wheel, stand, and a section of the step-rail or supporting-rail. Fig. 2 is a vertical central section of the stand, step, bolster, fan-wheel, step-rail, and drip-cup, showing the spindle in elevation, the section being lengthwise of said rail. Fig. 3 is a horizontal cross-section of the frame at the top of the step. Fig. 4 is a similar section between the top and bottom of the fan-wheel. Fig. 5 is a vertical central longitudinal section of the upper part of the stand and bolster. Fig. 6 is a perspective view of the step-rail with spindle and stand removed, showing the drip-cup and the oil-passage in said rail. Fig. 7 is a vertical cross-section of the rail and stand, showing a brake attached to the rail. Fig. 8 is a vertical cross-section of a ring-spinning frame with driving and shipping mechanism, step-rail, ring-rail, brakes, blower, spindles, and bobbins and trunks, the fast pulley, the fan of the rotary blower, and a part of the driving-belt of said blower being shown in dotted lines; Fig. 9, an isometric view of a part of the shipper-rod and the arms which operate the brake-shaft.

A is the frame of a ring-spinning machine. B′ is the fast pulley on the driving-shaft B. D is a driving-belt; D′, a belt-shipping fork attached to the shipper-rod D^2. A horizontal arm, D^3, is rigidly attached to the shipper-rod, and is slotted vertically at right angles to said shipper-rod. The "shipper" F, so called, is a vertical rod provided at the top with a cross-head, F′, (by means of which said shipper is revolved by hand,) and at the lower end with an arm, F^2, having a downwardly-projecting pin, F^3, which enters the slot in the arm D^3, so that by turning the cross-head F′ quarter-way round the fork D′ throws the belt from the fast pulley B′ to the loose pulley, (not shown,) or vice versa, to stop or start the machine, as may be required. The step-rail G supports the spindles, as hereinafter described. H is the ring-rail.

All the parts above named are old, and, together with drawing-rolls, guide-wires, and the necessary gearing, are constructed, supported, and operated in the usual manner.

The bobbins S′ are supported on the spindles S in the usual manner. The spindle S, instead of being supported in a step-rail and bolster-rail, as usual, is supported in a stand, G′, which contains both a step and a bolster, and which is secured to the step-rail G by means of screws G^2, which pass up through said rail G into the bottom of the stand G′. The power is applied to the spindle between the bolster and step. The stand is preferably of the form shown, consisting of a broad circular base resting on the rail G and arms which rise vertically and unite at the top, as shown.

The step L consists of two hollow concentric cylinders, cast in one piece and closed at their lower ends, the inner cylinder being the longer.

The step L is placed within a hollow opening, K, in the top of the base of the stand G′, and is adjusted to its position by three screws, J, which turn in the raised central part of the base of the stand and thrust against the upper part of the inner cylinder of the step L, said screws J lying in the same horizontal plane, each screw being at an angle of one hundred and twenty degrees from each of the others. The object of this adjustment is to enable the spindle to be brought in a perfectly vertical position. The spindle runs in the inner cylinder of the step L, and is oiled by turning oil into the outer cylinder of said step, from which outer cylinder it runs into the inner cylinder through an oil-hole, O, placed below the top of the outer cylinder. Any surplus of oil flows over the top of the outer cylinder into

the space K, (which is larger than the step L,) and through an opening, K′, in the base of the stand G′, and through an opening, K², through the rail G into the cup P. In order that the oil may find its way from the opening K′ into the opening K², when these openings are not exactly in line with each other, there is an annular groove, K³, cut in the top of the step-rail which enters the passage K², and the stand is placed on the rails so that the passage or opening K′ will come directly over this annular groove, so that the two openings K′ K² will always be connected with each other. The cup P, which receives the drip, has a long arm, P⁴, which turns on the pivot P′, so that the cup may be swung out from under the step-rail. The cup is held up flat against the under side of the step-rail by a spring, P², of coiled wire, which surrounds the pivot P′, between the head of said pivot and the under side of said arm P⁴. The arm P⁴ is jointed at P⁵, and has a part, P⁶, which projects for some distance back of the joint toward the pivot, but not so far as to prevent the cup from being tipped to discharge its contents when the cup is swung out from under the step-rail. The projection P⁶ will keep the cup in a horizontal position when the cup is under the opening K².

The cup P may be made of glass, so that the quantity of oil in it may be known by a glance without swinging out the cup.

Dirt and lint may be kept out of the step L by the annular cover L′, which surrounds the spindle and drops down over the chamber K, as shown in Fig. 2.

The upper bearing or bolster, M, may be provided with a brass bushing, M′, having an internal spiral groove, M², to carry the oil up on the spindle, as usual, (see Fig. 2;) but I prefer to surround the spindle within the bolster with a series of compressible washers, M³, say of rawhide, and to compress these washers by the screw-cap M⁴, which screws into the top of the bolster. These washers absorb and retain the oil in and between themselves, saving oil and requiring less frequent oiling. Below the bolster is a cup, M⁵, secured to the spindle, and having its circular rim within an annular groove, M⁶, in the bottom of the bolster, to prevent oil from dripping down onto the whirl or fan-wheel, hereinafter described, according as one or the other may be used.

A spindle such as is shown may be driven by a whirl attached to the spindle by a band from the band-cylinder in the usual manner. I prefer, however, to attach to the spindle S a fan-wheel, N, provided with radial fans N′, which are stiffened by being secured at top and bottom in any convenient manner to disks N², which wheel occupies about the place at which the whirl is commonly secured to the spindle. I drive the spindle by a current of compressed air directed against the fans N′. The air is conducted in trunks or pipes Q, which are provided with blast-pipes Q′, the latter being of smaller diameter and opening out of said trunks, and cut away to the shape of the wheel N, as shown in Fig. 4. The blast-pipes are made of somewhat flexible sheet metal, and a screw, Q², turning in a threaded projection, G³, on the stand G′, thrusts against the extension or long side Q³ of the blast-pipe to adjust the distance between said extension Q³ and the fan-wheel N, to direct the blast of air more directly against the wheel, and to prevent the air from escaping between the wheel and the blast-pipe without performing its work. The air is supplied to the trunks Q by a rotary blower, R, of any approved construction, which blower is driven by a belt, R′, passing over a pulley, B³, secured to the shaft B, and over a smaller pulley, R², secured to the spindle of the blower.

As the spindles are driven by a current of air, they are likely to be revolved by their own momentum for a short interval after the belt is shipped onto the loose pulley and the rest of the machine is stopped. Therefore I support a shaft, T, in bearings T′ on the outside of the step-rail, above said step-rail, (see Figs. 7 and 8,) and to this shaft are attached spring-arms T², one for each spindle, each of said arms having at its free end a plate or broad surface, T³, which may be covered with leather or other soft material. By rocking this shaft T forward the attached plates T³ are pressed against the spindles below the fan-wheel, stopping the spindles instantly. The arms T² are made to yield slightly, so that all the plates T³ may be pressed against the spindles, even if the spindles are not perfectly in line, or if the arms T² do not all have the same reach. The shaft T is provided with an arm, T⁴, rigidly secured thereto, which arm T⁴ has on its free end an incline, T⁵, so placed that the pin F³, sliding over said incline when the shipper F is revolved, forces down the free end of said arm T⁴, rocks the shaft T, and presses the brakes against the spindles.

As a further precaution against one part of the machine running after the rest has stopped, I use a valve, V, secured to the rod V′, the latter being secured to the shipping-rod D², so that when the belt is thrown off the fast pulley the valve is shoved into the trunk, closing the same.

I claim as my invention—

1. The combination of the shipper F, the rock-shaft T, provided with brakes, and means of connecting said shipper and rock-shaft, and operating said rock-shaft and brakes by the movement of said shipper, as and for the purposes set forth.

2. The combination of the shipper F, provided with the arm F² and pin F³, the rock-shaft T, provided with brakes, and with an arm, T⁴, having an incline, T⁵, at its free end, as and for the purpose specified.

3. The combination of the shipper-rod, the shipper, the arm V′, the valve V, and the trunk Q, as and for the purpose specified.

4. The oil-cup P, provided with the jointed arm P⁴, turning on the pivot P′, in combination

with said pivot and the spiral spring P^2, as set forth.

5. The stand G′, provided with the cavity K and the oil-passage K′, in combination with the rail G, provided with the oil-passage K^2, and the cup P, as and for the purpose specified.

6. The stand G′, provided with the cavity K and oil-passage K′, and the rail G, provided with the annular groove K^3 and oil-passage K^2, and the oil-cup P, as and for the purpose specified.

JOHN S. RICHARDSON.

Witnesses:
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H. P. YOUNG.