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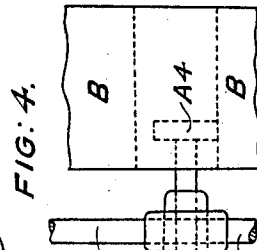
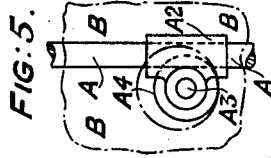
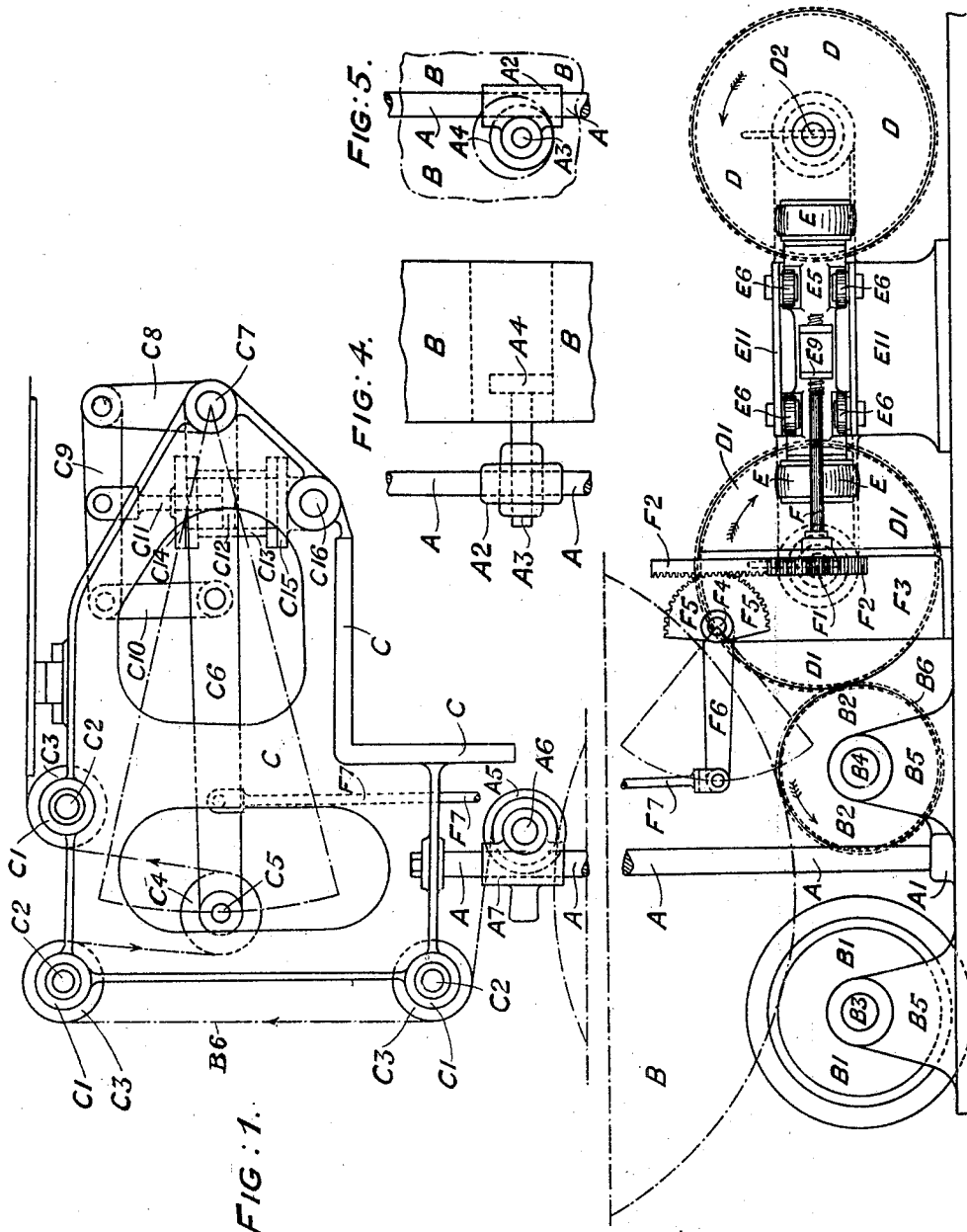
1,520,546

J. MURRAY

ROTARY PRINTING MACHINE

Filed Dec. 29, 1922

4 Sheets-Sheet 1



INVENTOR:-
JOHN MURRAY
by his Attorneys
Howson and Howson

Dec. 23, 1924

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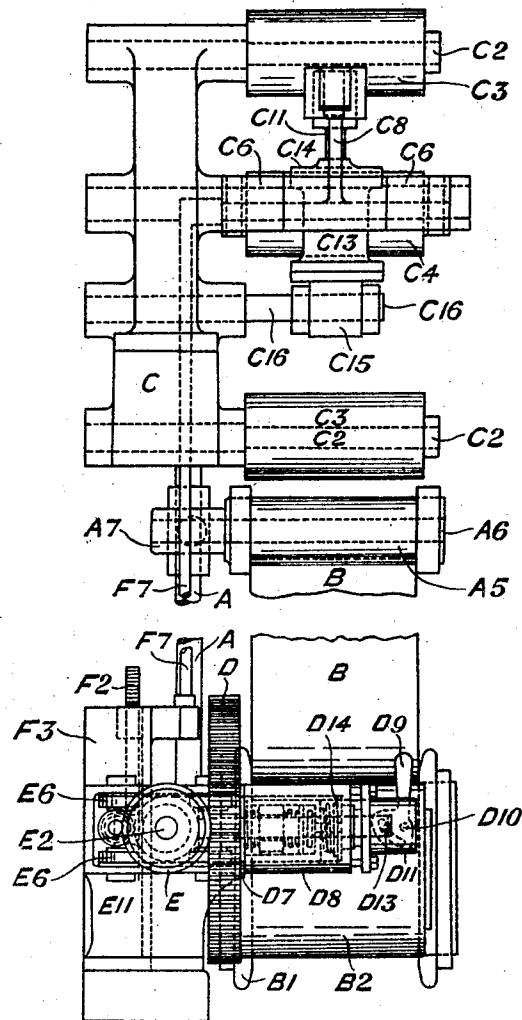
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FIG. 2.



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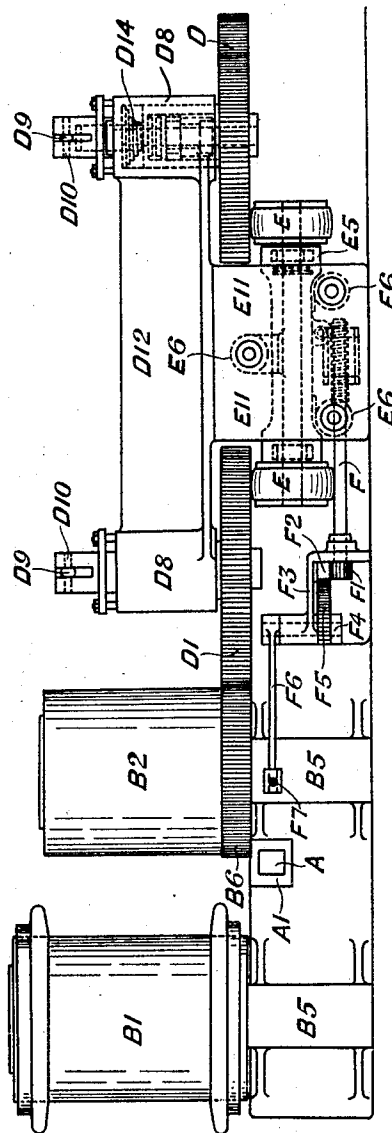
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FIG: 3.



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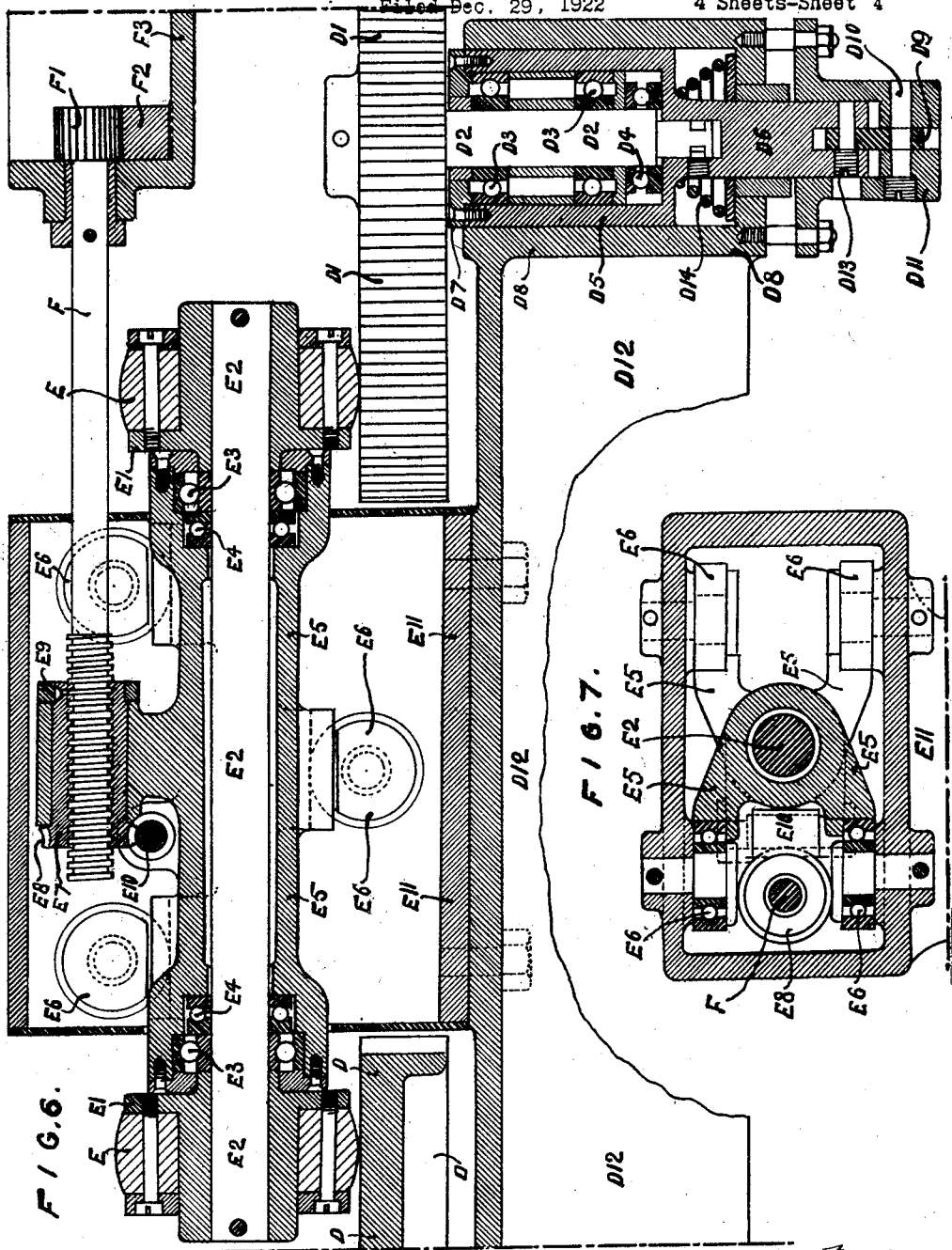
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ROTARY PRINTING MACHINE

Filed Dec. 29, 1922

4 Sheets-Sheet 4



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Patented Dec. 23, 1924.

1,520,546

UNITED STATES PATENT OFFICE.

JOHN MURRAY, OF LONDON, ENGLAND.

ROTARY PRINTING MACHINE.

Application filed December 29, 1922. Serial No. 609,659.

To all whom it may concern:

Be it known that I, JOHN MURRAY, a British subject, and a resident of London, England, engineer, have invented certain new and useful Improvements in Connection with Rotary Printing Machines, of which the following is the specification.

The invention relates to rotary machines printing from the continuous web, and has for its object to provide improved means for the support and driving of the reel of paper, such that its insertion in the machine is facilitated and the speed of the unrolling of the web is controlled directly by and in accordance with the speed demanded for its travel by the machine.

According to the invention there are provided two rollers between flanges on which the reel is supported on its periphery. The rollers which are arranged with their axes parallel with the axis of the reel, are so proportioned and positioned as to adequately support the reel from beneath against rolling movement. One of the rollers is driven, and by the frictional contact of its peripheral surface with the peripheral surface of the reel, drives the latter at its surface speed. A third roller, preferably flanged, weighty or loaded and freely guided vertically, may be applied to the reel vertically above its axis in order to prevent the reel becoming displaced on the lower rollers.

As in certain known winding, unwinding and reeling machines, the speed of this driven roller is regulated, in accordance with the demand of the machine, by means of a jockey pulley arranged in a bight of the web hanging between two horizontal rollers in the machine, which jockey pulley thus rises and falls with variation between the speed at which the web is unreeled and the speed demanded by the machine. The rising and falling jockey roller is operatively connected to and controls a variable-speed device through which the reel-driving roller is driven.

The variable-speed device may be of any convenient form but preferably it is of friction-disc-and-pulley type, and according to an illustrative example of this type, there are provided two friction discs lying in the same plane, one operatively connected to and driving the reel-driving roller and the other driven at constant speed from the machine gearing. With these friction discs there contact two friction pulleys fast on

opposite ends of a spindle and carried in a carriage transversable radially to the two discs.

This carriage is operatively connected to the jockey pulley which is in the bight in the web—for example, the jockey pulley may be carried on a forked lever connected by a link to a toothed quadrant operating a rack bar which engages a pinion on a spindle held against endwise movement and screwed to engage a nut on the carriage.

Means are provided for adjusting the relative position of the carriage—for instance, the nut may be rotatably adjustable in the carriage.

Means are provided for holding the discs in contact with the friction pulleys—for instance, by axially applied springs, and means are provided for disengaging the reel-driving roller from its driving gear.

An example of the carrying out of the invention is shown on four accompanying sheets of drawings in which Figure 1, Sheet 1, Figure 2, Sheet 2, and Figure 3, Sheet 3, are a side elevation, an end elevation, and a plan respectively, while Figures 4 and 5, Sheet 1, show a detail, and Figures 6 and 7, Sheet 4, show respectively a sectional plan and a cross-section to an increased scale.

In the example shown there is provided a vertical rod A the lower end of which is supported in a socket A¹ on the base of the rotary machine and the upper end of which is fixed to a bracket C attached to the machine.

On the rod A is fitted a block A² free to slide which carries a pin A³ with a disc-like head A⁴ whose axis is at right angles to that of the rod A. Upon this pin is carried the reel of paper B.

The bracket C has three bosses C¹ which support, by means of pins C² fixed in them, horizontal rollers C³ free to rotate but prevented from moving endwise. A jockey pulley C⁴ is carried by a pin C⁵ supported at each end by a lever C⁶ pivoted on a pin C⁷ on which there is also pivoted a lever C⁸ connected by lever C⁹ and link C¹⁰ with the lever C⁶.

A rod C¹¹ is connected to the lever C⁹ and is attached to a piston C¹² moving in a cylinder or dash-pot C¹³ fitted with an upper cover C¹⁴ and a lower cover C¹⁵ provided with a boss free to rotate on a pin C¹⁶.

A flanged roller A⁵ is carried by a pin A⁶ fixed in a block A⁷ freely guided on the rod

A. This roller serves to guide the reel of paper now to be described.

A reel of paper B is supported on its periphery by two rollers, one B¹ with flanges between which the reel is held and the other B² without flanges but having at one end of it a spur pinion B³. The rollers B¹, B² are free to rotate on pins B³, B⁴, respectively carried by brackets B⁵ formed on the base of the rotary machine.

The friction discs D and D¹ lie in the same plane and are exactly similar. One D is driven at constant speed from the machine gearing, the other D¹ driving the reel-driving roller B².

The friction discs D and D¹ are fixed on shafts D² which rotate on roller bearings D³ and an end thrust roller bearing D⁴ all contained in a sleeve D⁵ having a cylindrical extension D⁶ and a cover plate D⁷. The sleeve D⁵ is free to slide in a housing D⁸ forming part of a bracket D¹² and is operated by a quadrant D⁹ fulcrumed on a pin D¹⁰ fixed in a gland D¹¹ connected to the housing D⁸. The quadrant D⁹ is provided with a slot which embraces a pin D¹³ fixed in the extension D⁶ of the sleeve D⁵ and the movement of the quadrant causes the sleeve to slide in the housing D⁸ against the action of a spring D¹⁴.

With the friction discs D and D¹ there contact two friction pulleys E consisting of frictional material secured to a boss E¹ fixed on opposite ends of a spindle E² which rotates on ball bearings E³ and an end thrust bearing E⁴. These bearings are supported in a carriage E⁵ traversable radially to the two discs D and D¹ moving between rollers E⁶ fixed in a bracket E¹¹ rigidly attached to the base of the rotary machine and having rigidly attached to it the bracket D¹².

The carriage E⁵ is provided with a nut E⁷ formed at one end as a worm wheel E⁸ and provided with a collar E⁹ to prevent endwise movement. The nut E⁷ may be rotated by turning a worm E¹⁰ gearing with it. A spindle F having a square thread screw at one end engages with the nut E⁷ and is fitted at the other end with a pinion F¹ which engages with a rack F² arranged to slide vertically in a bracket F³ secured to the base of the machine.

The bracket F³ supports the end of the spindle F and also a spindle F⁴ carrying at one end a toothed quadrant F⁵ operating the rack F² and at the other end a lever F⁶ connected by a link F⁷ to the lever C⁶.

In operation, the reel of paper B is supported by its periphery on the rollers B¹ and B² whose axes are parallel with the axis of the reel and are so proportioned and positioned as to permit rolling movement. The reel is rotated by the roller B² which drives it at its own surface speed.

The web B of the reel is passed round the

roller A⁵ which bears continuously on the periphery of the reel and guides it between its flanges, then round two of the rollers C³ to the jockey pulley C⁴ and from it over the remaining horizontal pulley C³ to the machine.

The speed of the roller B² is regulated in accordance with the demand of the machine by means of the jockey pulley C⁴ arranged in a bight of the web B hanging between the two horizontal rollers C³.

The jockey pulley rises and falls with variation between the speed at which the web is unreeled and the speed demanded by the machine. The rising and falling jockey pulley controlled by the dash pot C¹³ through the levers C⁶ operatively connected to the quadrant F⁵ and rack F² controls the action of the screwed spindle in the nut E⁷ and thus causes the carriage E⁵ to traverse radially to the two discs D and D¹.

The friction disc D is driven at constant speed by the spindle F of the machine while the speed of the disc D¹ is variable, depending on the position of the pulley E bearing on its face. The discs D and D¹ are held in contact with the friction pulleys E by the action of the axially applied springs D¹⁴ and the reel-driving roller B² is stopped by disengaging the disc D¹ from the pulley E by means of the quadrant D⁹.

What I claim is:

1. In connection with rotary printing machines, paper reel driving mechanism comprising a reel, two rollers, one having flanges, both lying parallel with the axis of the reel and supporting it by its periphery, means for driving one of said rollers, and a jockey pulley in a bight in the web, in combination with means for varying the speed of drive from said jockey pulley, said means including a driving and a driven friction disc on parallel axes and side by side, a shaft at right angles to and cutting the axes of the discs and a pair of friction pulleys on said shaft and engaging said discs on opposite sides of their centers, means for maintaining the pulleys in driving contact with the disc and means operated from the said jockey pulley for moving said friction pulleys radially upon the disc, comprising levers carrying the jockey pulley, a pivoted quadrant, a link connecting the levers to the quadrant, a double rack engaged by the quadrant, a shaft having screw threads thereon and a pinion on said shaft engaged by said double rack, a nut engaging said screw threads, and a casing carrying the friction pulleys in which said nut is fixed movable radially to the friction discs.

2. In connection with rotary printing machines, paper reel driving mechanism comprising a reel, two rollers, one having flanges, both lying parallel with the axis of the reel and supporting it by its periphery,

in combination with a third roller guided vertically and bearing on the upper part of the periphery of the reel; means for varying the speed of drive from said jockey pulley, 5 said means including a driving and a driven friction disc on parallel axes and side by side, a shaft at right angles to and cutting the axes of the discs and a pair of friction pulleys on said shaft and engaging said discs on opposite sides of their centers, means 10 for maintaining the pulleys in driving contact with the disc and means operated from the said jockey pulley for moving the pulleys radially upon the discs.

In testimony whereof I have signed my 15 name to this specification.

JOHN MURRAY.