

April 6, 1926.

1,579,683

B. C. WHITE

SPEED INDICATING MECHANISM FOR ROLL CHANGERS AND THE LIKE

Filed August 25, 1923

3 Sheets-Sheet 1

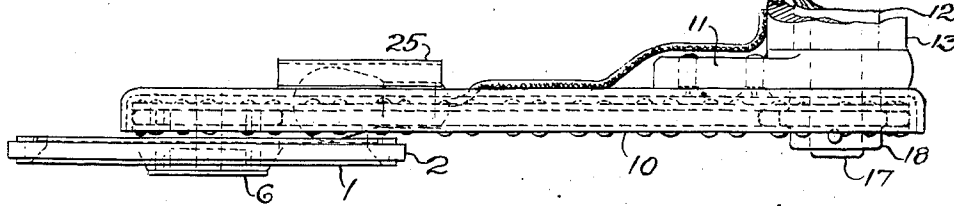


Fig. 1.

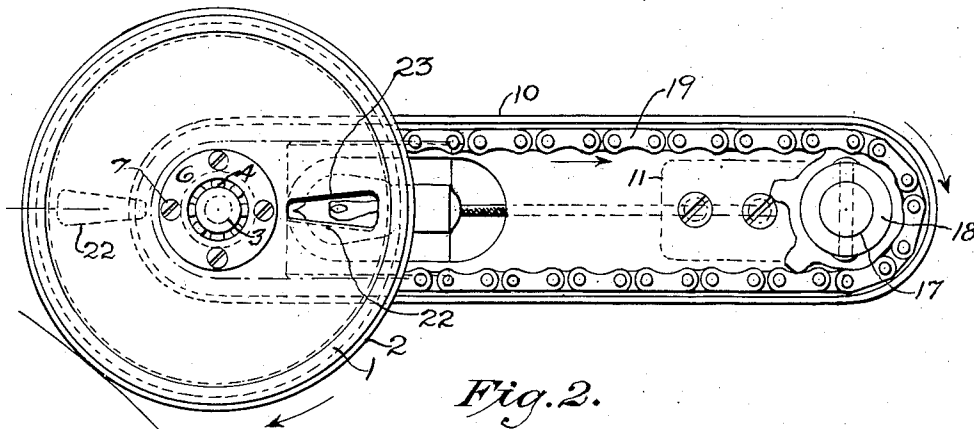


Fig. 2.

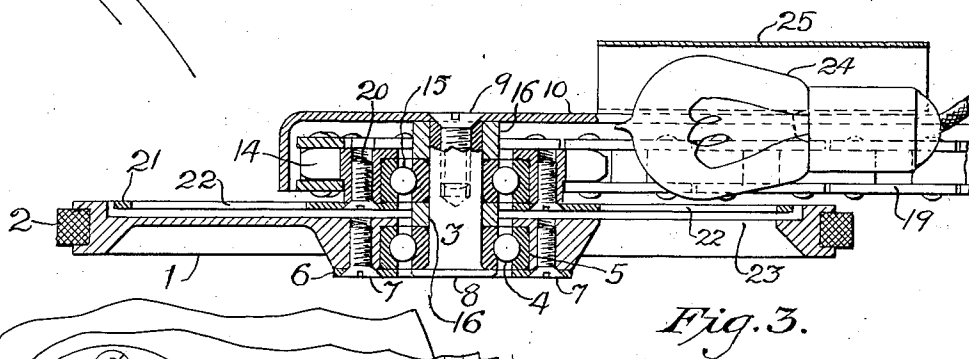


Fig. 3.

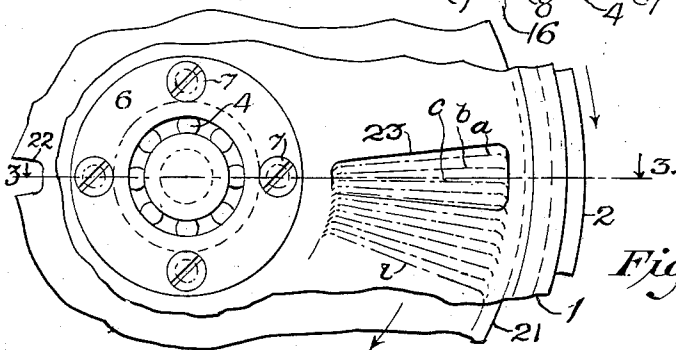


Fig. 4.

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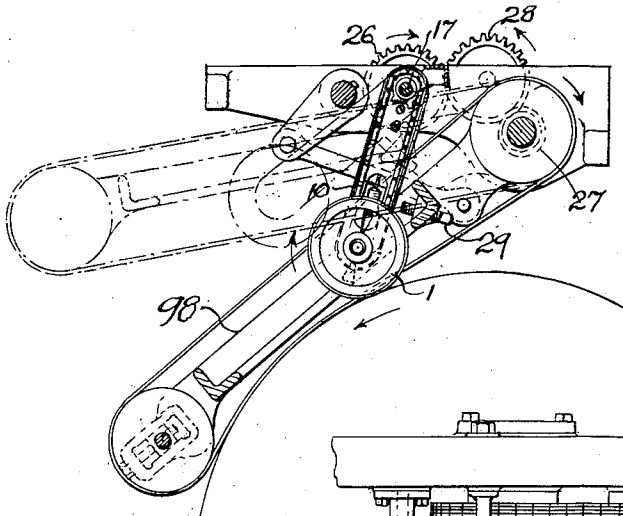


Fig. 5.

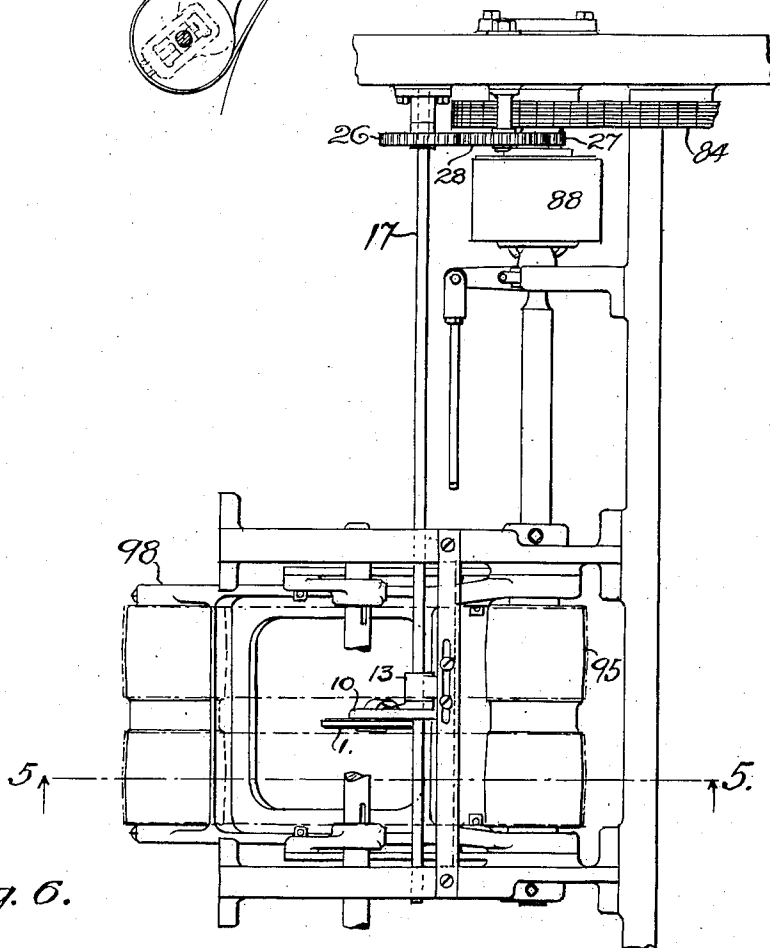


Fig. 6.

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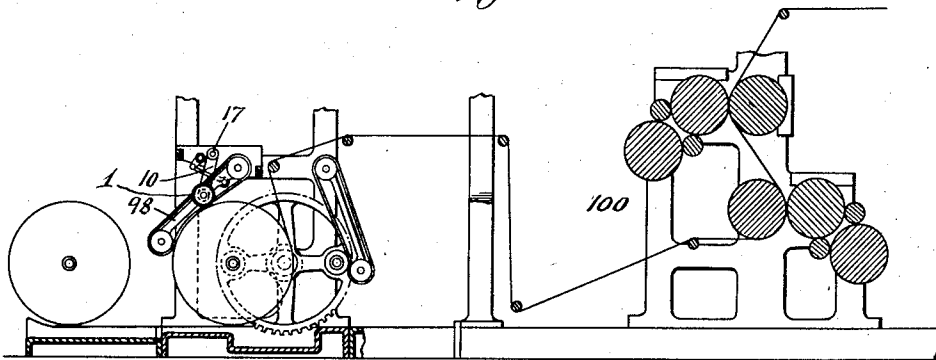
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3 Sheets-Sheet 3

Fig. 7.



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UNITED STATES PATENT OFFICE.

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R. HOE AND CO., INC., OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

SPEED-INDICATING MECHANISM FOR ROLL CHANGERS AND THE LIKE.

Application filed August 25, 1923. Serial No. 859,270.

To all whom it may concern:

Be it known that I, BRUCE C. WHITE, a citizen of the United States, residing at New York, county of New York, and State of New York, have invented certain new and useful Improvements in Speed-Indicating Mechanism for Roll Changers and the like, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

This invention relates to speed indicating mechanism adapted particularly to roll changing devices for rotary printing presses in which means are employed for speeding-up a fresh roll of paper, preparatory to pasting it to a web running from an expiring roll.

One object of my invention is to provide a means whereby the peripheral speed of the fresh roll of paper relative to the lineal speed of a web running from a roll in use, will be indicated to the operator, whereby he may know whether or not the said speeds correspond with sufficient accuracy to permit of a successful pasting of said roll to said web. Should the fresh roll of paper have a peripheral speed less than the lineal speed of the running web, the freshly pasted portions of the two webs will be pulled apart, due to the greater speed of the web from the expiring roll.

In practice I find that very slight differences in these two speeds make it impossible to effect the pasting with any certainty that it will hold together until the pasted place has safely passed the "drawing in" rollers, or has reached the printing elements. Where web tension rollers are used it may be necessary to speed up the fresh roll to run slightly faster than the web from the expiring roll, in order to ease the tension on the web. Whatever the most favorable speed may be, it will become the standard relative speeds of the two webs to insure a proper paste, when once determined.

The further object of my invention is to provide a simple, illuminated rotating disk, mounted to swing into contact with the fresh roll when the speed-up traction belts are swung into contact with said roll and to be lifted clear of an incoming fresh roll when said traction belts are so lifted. Thus the operator is relieved of the task of manipulating the indicator.

Another object of my invention is to so mount the indicator that it may be applied to full width or half width rolls, whether the latter be used at the middle or at one side or the other of the center line, for which purpose a lateral adjustment is provided.

Another object of my invention is to provide a visible speed indicator which will show at a glance which of two running elements is the faster and approximately how much faster, one which is visible night or day and may be placed in any visible position in the interior of the machine.

In the accompanying drawings, Fig. 1 is a plan view of my indicator. Fig. 2 is a side elevation. Fig. 3 is an enlarged detail section on line 3—3 of Fig. 4. Fig. 4 is an enlarged detail side elevation showing in dotted lines the advance of the flash due to the unequal speeds of the disks. Fig. 5 is a vertical section on line 5—5 of Fig. 6 showing the device mounted in a roll changer. Fig. 6 is a plan view of the same. Fig. 7 is a diagrammatic side elevation, partly broken away and partly in section, of a printing machine with the improved speed indicator in position.

In the accompanying drawings 1 is a traction wheel, provided preferably with a rubber rim 2, and mounted upon a stud 3 with an antifriction ball bearing 4 in the recessed hub 5 of said wheel, said ball bearing 4 being retained in said hub 5 by means of a plate 6 secured thereto by screws 7. The stud 3 has a head 8 formed upon it and is secured by means of screw 9 to the hollow swinging arm 10. The latter is fastened to the lug 11 of the arm hub 12, which latter turns freely in the bearing 13, permitting the arm to swing up and down.

Mounted to rotate freely upon the stud 3 is a sprocket-wheel 14, into the recessed hub of which is inserted a ball bearing 15, whereby the said sprocket-wheel will turn freely upon the stud 3. Bushings 16 upon the stud 3 permit the inner or non-rotating members of the ball bearings to be clamped firmly upon the stud. A shaft 17 rotates freely in the arm hub 12 and drives a sprocket wheel 18. About this sprocket wheel 18 and the sprocket-wheel 14 is trained a sprocket chain 19. Secured to the sprocket-wheel 14 by screws 20 is a disk 21 provided with radial slots or openings 22.

The wheel 1 is also provided with a slot or opening 23. A small electric lamp 24 is so placed that its light will shine through the slots when the latter coincide in angular position. A guard 25 is preferably provided to protect the lamp from breakage and reflect its light. The shaft 17 extends through the rear frame of the machine and has secured to it a gear 26, driven from a pinion 27 upon the driving shaft of the roll changer through an intermediate gear 28. The said driving shaft partakes of the rotation of the printing press through chain 34, whereby the disk 21 will have a rotation corresponding exactly to that of the travel of the web from the paper roll in use. The arm 10 is so arranged that when lowered the wheel 1 will come in contact with the periphery of the speeded up fresh roll of paper. The gearing is preferably so proportioned that the wheel 1 will make two revolutions when the disk 21 makes 1 revolution. I provide the latter with two opposite slots 22. As the disk 21 is driven from the press and the wheel 1 is driven from the speeded up spare roll, when the peripheral speed of the spare roll is the same as that of the web running from the expiring roll, one of the slots 22 in the disk 21 will be in register with the slot 23 in the wheel 1, and the synchronism or motion of the parts will be indicated by regular flashes at a fixed point. Should the relative speeds differ, the flash will appear to turn slowly in one direction or the other, depending upon which element runs the faster. This movement of the flash position is due to the fact that the meeting point of the slots 22 and 23 will change in angular position, when the relative speeds of the two elements differ. The actual speed of the press affects the accurate reading of the indicator. The radial lines *a*, *b*, *c*, etc. in Fig. 4 indicate the successive crossing points in approximately a second of time for about one percent of speed difference.

I preferably hang the indicator between the pair of traction belts nearest the front of the press 100 and adjustably support the arm 10 upon a set-screw 29 in the swinging arm 98 of the roll changer, whereby the lowering of the said swinging arm will lower the arm 10 and permit its wheel 1 to contact with the paper roll.

On account of the drive for disk 21 being taken from the positively geared elements of the press, it follows that the indicator will betray any slip in the clutch-pulley 83, traction-belt pulleys 95 or in the contact of the traction belts with the fresh paper roll, when the latter is assumed to be speeded up. If such slipping occurs it may be corrected, or the speed-up may be over-speeded and the correct relative speed may be attained by manipulating the clutch-pulley

83, or the press may be slowed to permit the paper roll through its momentum to attain the reduced press speed.

While the operation of the device is believed clear from the foregoing, it may be stated briefly as follows:

After the paper roll has been put in place the arm 98 is lowered to bring the driving belts in contact with the roll surface. This movement lowers the traction wheel 1 into contact with the surface of the roll. As the press is now started and the disk 21 runs at the press speed, the traction wheel being in contact with the roll runs at the roll speed. As the press is speeded up and the roll is speeded up, the disk 21 and the traction wheel 1 run at the corresponding speed of the press and the roll. When the speed of the spare roll is the same as that of the web running through the press, one of the slots 22 in the disk 21 registers with the slot 23 in the wheel 1 and the synchronism of the parts is indicated by regular flashes.

I have shown this device as applied to a roll-changer for a printing press. Obviously it may be used in any device in which it is important to know whether or not the relative speeds of independently driven parts of a machine or of different co-acting machines are properly synchronized. Many modifications may be made in the mechanism without departing from its principle of operation.

What I claim is:

1. In a speed indicator for indicating the relative speeds of two revolving elements, a supporting arm, a disk driven by one of the elements and supported by the arm, a disk driven by the other of the elements and supported by the arm, and means for visually detecting variations in the speeds of the two disks.

2. In a speed indicator for indicating the relative peripheral speeds of two revolving elements, a supporting arm, a disk driven by one of the elements and supported by the arm, a disk driven by the other of the elements and supported by the arm, one of said disks having a greater number of revolutions than the other, and means for detecting variations in the speeds of the disks.

3. In a speed indicator for indicating the relative peripheral speeds of a positively driven element, and a frictionally driven element, a disk rotated by each element, one of said disks being driven at a greater number of revolutions than the other, and slots through said disks, whereby it may be seen at what relative speeds the said two disks are being driven.

4. In a speed indicator for indicating the lineal speed of a web as it is unwound from a roll by a printing press as compared with the peripheral speed of a fresh roll of paper frictionally driven preparatory to attaching

the said web to said fresh roll, a revolving element positively driven from said printing press, a rotating element concentric with said revolving element and in frictional engagement with the roll, and means for indicating whether or not the speeds of said elements are synchronized.

5. In a speed indicator for indicating the speed of a web in use in a printing press, as compared with the peripheral speed of a frictionally driven roll of paper, a disk driven by the web advancing means, a disk frictionally driven from said roll of paper, said disks being concentrically mounted and provided with openings in combination with a light arranged to shine through said openings whenever they coincide in angular positions, the succession of such coincidences indicating to the observer by their angular positions whether or not the rotation of said disks is synchronized.

6. The combination of a disk frictionally driven from a roll of paper and provided with a single opening or port therethrough with a disk positively driven by a web advancing means and provided with two ports therethrough and driven at half the revolutions of the single ported disk, said disks being concentrically mounted to rotate in the same direction, whereby their ports will coincide in angular position twice in every revolution of said single ported disk, and in the same angular position while the disk speeds are synchronized.

7. In a speed indicator for indicating the peripheral speed of a frictionally driven roll of paper as compared with the lineal speed of a web in use in a printing press, an arm for lowering a traction belt upon said roll, an arm for said indicator supported by said traction belt arm whereby the lowering of the latter will lower the indicator to contact with said roll of paper and

the lifting of the said traction belt arm will lift the said indicator.

8. In a speed indicator for indicating differences between the peripheral speed of a driven roll of paper and the lineal speed of a running web, a supporting arm, a disk carried by the arm and arranged to be brought into frictional engagement with the paper roll, a second disk carried by the arm and driven at the speed of the running web, slots in the disks, and a light arranged behind the disks, the light showing in regular flashes at a fixed point when the speeds of the disks are synchronized.

9. In a speed indicator for indicating differences in the peripheral speed of a driven roll of paper and the lineal speed of a running web, a supporting arm, a disk carried by the arm and arranged to be brought into frictional engagement with the paper roll, a slot in the disk, a second disk carried by the arm, oppositely disposed slots in this second disk, means for driving the second disk at the speed of the running web, said disks being timed to have different periods of revolution, and means for detecting differences in the speeds of the disks.

10. In a speed indicator for indicating differences in the peripheral speed of a driven roll of paper and the lineal speed of a running web, a pivoted supporting arm, a rotary element carried by the arm for frictional engagement with the paper roll, a second rotary element carried by the arm and driven at the speed of the running web, openings in the rotary members, and a light placed behind the members and acting to give regular flashes at a fixed point when the speeds of the rotary members are synchronized.

In testimony whereof, I have hereunto set my hand.

BRUCE C. WHITE.