

Nov. 5, 1940.

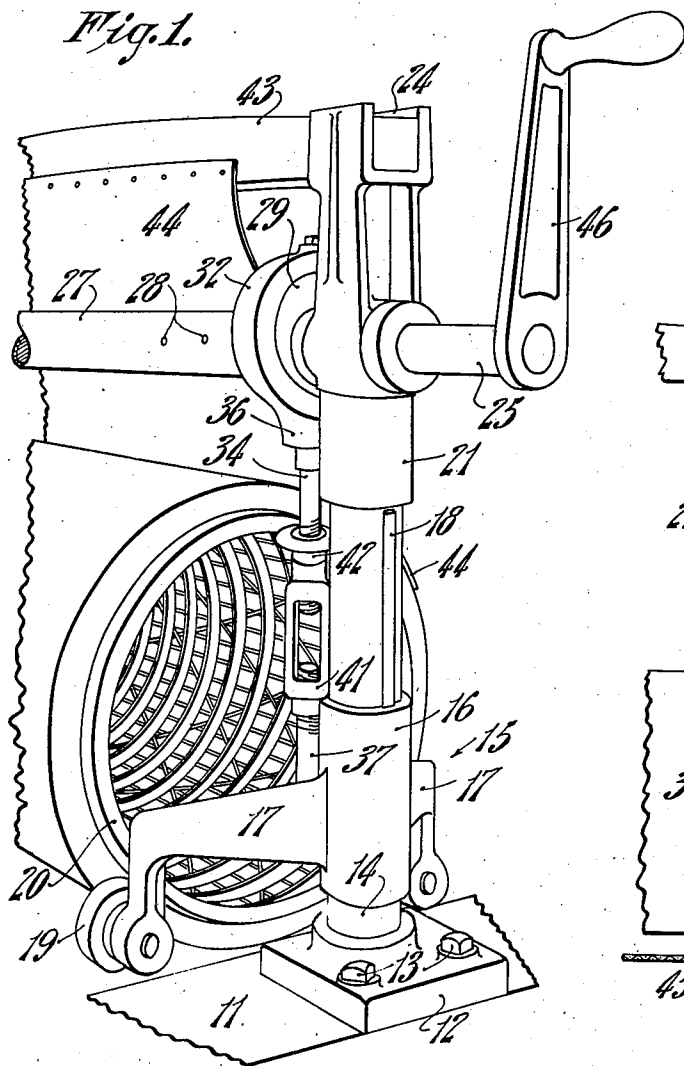
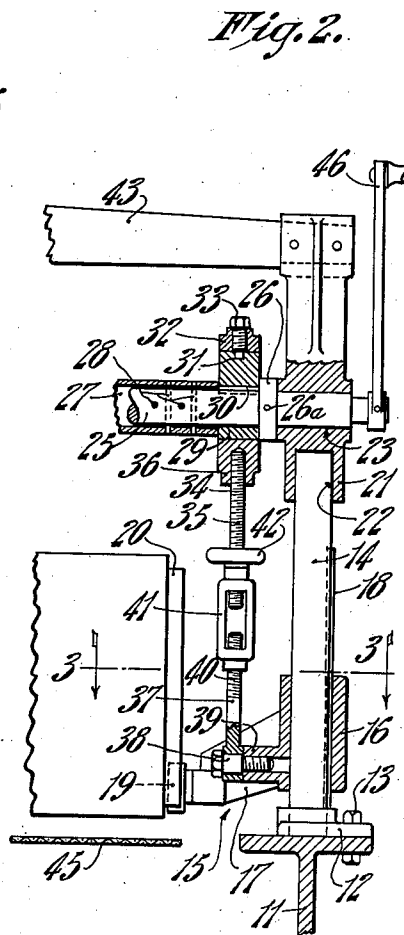
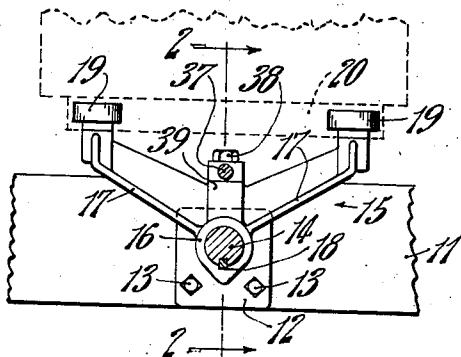
P. S. SINCLAIR

2,220,853

SUPPORTING STAND FOR DANDY ROLL

Filed May 25, 1936

2 Sheets-Sheet 1



INVENTOR,
Peter S. Sinclair,

BY

Frank E. Haskell

ATTORNEY.

Nov. 5, 1940.

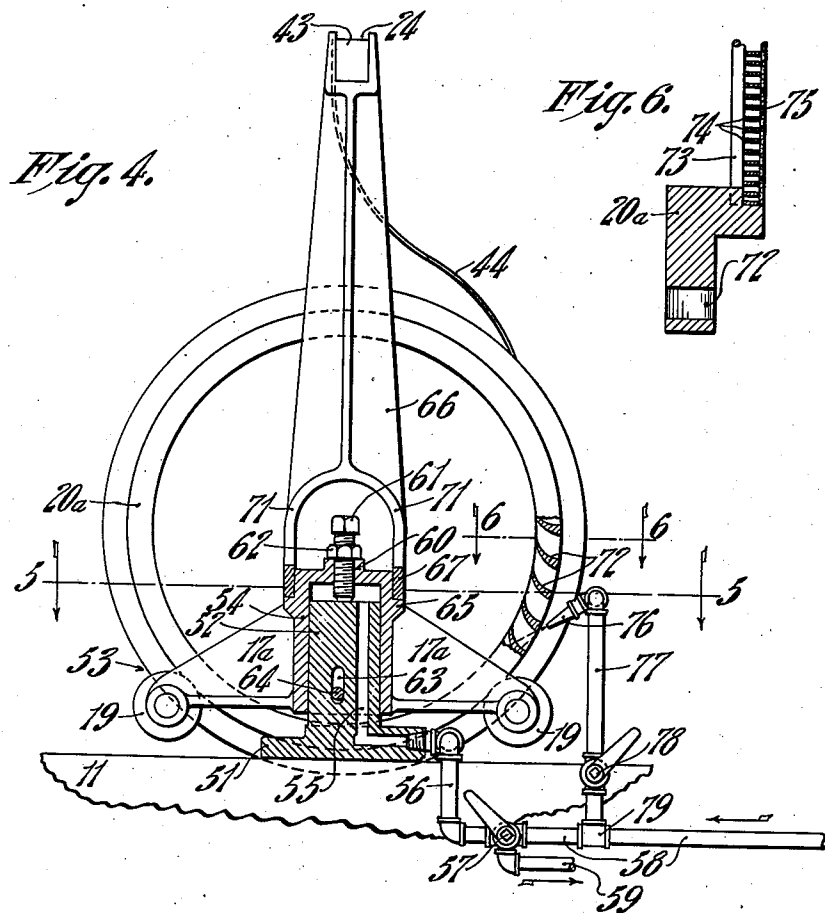
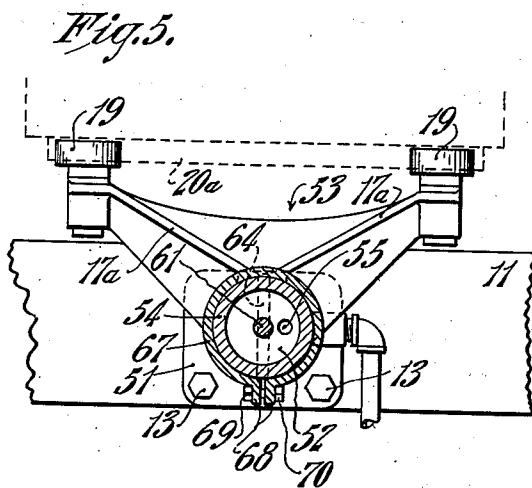
P. S. SINCLAIR

2,220,853

SUPPORTING STAND FOR DANDY ROLL

Filed May 25, 1936

2 Sheets-Sheet 2



INVENTOR,

Peter S. Sinclair,

BY

Frank E. Haskell

ATTORNEY.

UNITED STATES PATENT OFFICE

2,220,853

SUPPORTING STAND FOR DANDY ROLL

Peter S. Sinclair, Holyoke, Mass.

Application May 25, 1936, Serial No. 81,720

9 Claims. (Cl. 92-48)

This invention relates to supporting stands for dandy rolls. It has been customary to support a dandy roll rotatably at each end thereof by supporting structures which in turn rest on the machine rails of the paper-making machine. There have usually been provided at each end of the dandy roll two ball bearing rolls spaced some distance apart so that a vertical plane passing through the center of gravity of the dandy roll is about midway between the ball bearing rolls. Each of these rolls is pivotally supported on a separate stand or pedestal the distance apart of the stands varying considerably, principally with the diameter of the dandy roll, a value between 10 and 30 inches being common.

It is one of the objects of the present invention to support both of the ball bearing rolls, which are at the same end of the dandy roll, on the same supporting stand or pedestal of compact extent so that it is possible to mount the stand on paper-making machines where the available space on the machine rail is much less than the foregoing 10 to 30 inches.

In apparatus of this character, as heretofore constructed, in order to lift the dandy roll a slight distance above its normal working position, for the purpose of making adjustments, there has usually been provided interconnecting linkage whereby the lifting of each of the ball bearing rolls with respect to its own pedestal occurs simultaneously with that of the other ball bearing rolls.

It is a further object of the present invention to provide a single movable member on which are mounted both the ball bearing rolls at the same end of the dandy roll thereby simplifying the construction and rendering the support stronger and more rigid.

It is another object of the invention to provide for straight line vertical movement of the movable or supporting member and to provide means in the same vertical plane as the axis of the dandy roll for supporting and lifting said member.

It is also an object of the invention to position the wiper bracket directly above the dandy roll so that any dripping from condensation will fall on the dandy roll rather than on the paper web.

It is also an object of the invention, in one form thereof, to provide hydraulic means for raising the dandy roll away from the paper web with which it is being used and for lowering it in place again whereby the simple turning of a valve in a water pipe will do the necessary lifting without other effort on the part of the operator.

Still another object of the invention is to provide hydraulic means for rotating the dandy roll. More specifically it is an object of the invention to provide water wheel buckets on the head of the dandy roll and a nozzle for discharging a stream of water against the buckets.

In one of its specific phases it is an object of the invention to provide detachable means for supporting the wiper and wiper bracket so that they may be readily removed to provide better access to the interior of the dandy roll for cleaning and other purposes.

It is a still further object of the invention to provide a symmetrical supporting stand that is simple to construct and strong and rugged in operation.

The foregoing and other objects of the invention will readily appear to those skilled in the art to which it appertains by a consideration of the following description of one embodiment thereof taken in connection with the accompanying drawings in which

Fig. 1 is an end perspective view of a dandy roll mounted on a supporting stand embodying certain features of the invention;

Fig. 2 is a vertical elevation partly in section of the supporting stand of Fig. 1 together with the associated parts;

Fig. 3 is a horizontal section taken on the line 3-3 of Fig. 2;

Fig. 4 is an end view of another form of dandy roll and supporting stand, partly broken away to show certain parts in section;

Fig. 5 is a horizontal section taken on the line 5-5 of Fig. 4; and

Fig. 6 is a horizontal section of a portion of the dandy roll showing the water wheel bucket construction and is taken on the line 6-6 of Fig. 4.

Referring to the drawings in detail, and more particularly to the embodiment of the invention shown in Figs. 1, 2 and 3, the numeral 11 indicates one of the machine rails of a paper-making machine upon which there is positioned a base 12 which is secured in place by any suitable means such as bolts 13. A support 14 preferably cylindrical in form is either integral with the base 12 or secured thereto and extends vertically upwardly therefrom. A movable member in the form of a supporting yoke 15 is provided with a hub 16 and two outwardly extending arms 17. The hub 16 has an aperture therethrough of the same diameter as the support 14 so that it is slidable up and down thereon and is prevented from turning on the support by means of a spline

18. Each of the arms 17 carries a ball bearing roll 19, a pair of these rolls being used for rotatably supporting each end of the dandy roll by means of a flanged head or bearing 20. It will be noted that the diameter of these bearing flanges is about the same as the diameter of the dandy roll so that the interior of the dandy roll is open and readily accessible for any purpose whatever, convenience and accessibility for steam and water pipes being considered important features in dandy roll construction. The type of construction shown in the drawings is also of a different character from that of dandy rolls which have a supporting shaft extending along the axis of the roll from one end to the other whether considered from the standpoint of accessibility to the interior or from the standpoint of total structure and total weight to be removed when it becomes necessary to change rolls.

20 As shown in the drawings the upper portion 21 of the support is made as a separate piece although it may, if desired, be constructed as an integral part of the cylindrical support 14. The lower end of the portion 21 is provided with a cylindrical recess or socket 22 in which is positioned the upper end of the cylindrical support 14 and in which it is rigidly secured in place by shrinking or by any other suitable means. The upper portion 21 is also provided with a horizontal bearing 23 the axis of which is parallel to the axis of the dandy roll. At its upper end the portion 21 is bifurcated to provide a recess 24.

It is to be understood that the other end of the dandy roll from that shown in the drawings is provided with a similar supporting structure to that so far described. A supporting shaft 25, which may also be designated as a cam shaft, extends between the two supports, the one shown in the drawing and the one at the other end of the dandy roll and not shown in the drawings. A suitable collar 26 is secured to the shaft 25 at each end thereof just inside the support by means of a set screw 26a. A pipe or sleeve 27 is positioned on the shaft 25 between the two collars 26, a definite space separating each end of the sleeve and the adjacent collar. The sleeve is held in place on the shaft by a plurality of pins 28. In each of the spaces which separate the ends of the sleeve 27 and its adjacent collar 26 there is positioned a cam or eccentric 29 which is held from rotation with respect to the shaft by means of a key 30. The outside periphery of each cam is provided with an annular groove 31. An eccentric strap 32 is carried by each eccentric and is provided with a screw 33 which extends into the groove 31 and prevents relative axial movement between the eccentric and the eccentric strap.

The supporting yoke 15 is supported by the eccentric strap 32 by means of a rod which for convenience in making adjustments is in two parts. The upper portion 34 of the rod has a right-hand screw thread 35 throughout its entire length and screws, at its upper end, into a projecting portion 36 of the eccentric strap 32. The lower portion 37 of the supporting rod is provided with an eye or other suitable aperture at its lower end by means of which it is pivotally connected by means of a pivot bolt 38 with a boss 39 on the yoke 15. The upper end of the lower portion 37 of the supporting rod is provided with a left-hand screw thread 40. The upper and lower portions of the supporting rod are connected by means of a suitable turnbuckle 41 which may be securely held in place by means of a hand wheel operated lock nut 42. Extending from one side of the paper-making

machine to the other and resting at its two ends in the respective recesses 24 is a wiper bracket 43 to which is attached a wiper 44 usually of felt. The lower side of the bracket 43 may be notched out at each end where it rests in the recess 24 so as to prevent longitudinal shifting of the bracket.

When it is desired to raise the dandy roll from the Fourdrinier wire, shown at 45 in Fig. 2, the cam shaft 25, which is provided with a crank handle 46, is rotated 180 degrees thus swinging the eccentrics and eccentric straps to their uppermost positions and raising the dandy roll from the Fourdrinier wire. This is the relative position of the parts shown in Figs. 1 and 2. If it is desired to change the relative position of the dandy roll and Fourdrinier wire to obtain the best operating position of the dandy roll, the lock nut 42 may be loosened, the turnbuckle 41 adjusted, and the lock nut 42 again tightened in the new adjusted position of the turnbuckle.

The construction shown in Figs. 4 and 5 embodies that phase of the invention which relates to the hydraulic raising and lowering of the dandy roll with respect to the Fourdrinier wire. A base 51 somewhat similar to the base 12 has an upwardly extending cylindrical portion 52 which may be a separate piece but is preferably formed integrally with the base. A supporting yoke 53 has a hub in the form of a closed cylinder 54 which fits over the upwardly extending cylindrical portion 52. A pair of arms 17a extending outwardly from the hub 54 carry ball bearing rolls 19 which rotatably support the flanged head 20a of a dandy roll. A channel or passage 55 extends upwardly through the upwardly extending portion 52 of the base and opens into the space between the portion 52 and the head of the closed cylinder 54. At its lower end the channel 55 passes horizontally through the base 51 and is connected with a water pipe 56. The water pipe 56 is connected through a three-way valve 57 to a supply pipe 58 and a waste pipe 59.

In order to limit the downward movement of the hub 54, or cylinder, the head thereof is provided with a threaded aperture 60 in which there is positioned an adjustable screw 61 having a lock nut 62 for securing it in place after it has been adjusted. By means of this adjustment the height of the dandy roll, in its lower or operating position, with respect to the Fourdrinier wire over which it is rotating may be adjusted with a high degree of precision. In order to limit the upward movement of the cylinder 54 there is provided in the upwardly extending portion 52 of the base a vertically elongated aperture or slot 63 in which there is positioned a horizontal rod or pin 64 which in turn passes through apertures in the walls of the cylinder 54 so as to be rigidly connected with the cylinder. The upward movement of the cylinder is therefore limited by the pin striking against the upper end of the slot 64. The pin and slot also cooperate to prevent the yoke from turning on the pedestal and to limit the movement of the yoke to a rectilinear movement.

By referring to Fig. 4 it will be seen that there is a projection 65 which extends circumferentially around the cylinder 54 and provides a seat for a wiper bracket support 66. The lower end of the wiper bracket support is in the form of a split collar 67 and has an inner diameter such that it will just fit over the upper end of the cylinder 54 and rest on the seat 65. Ears 68

which extend outwardly from the collar 67 where it is split have apertures through which is positioned a clamping bolt 69 which is provided with a clamping nut 70. A pair of connecting members 71 spaced about 180 degrees apart and each about 90 degrees from the ears 68 extend upwardly from the collar 67 to the main portion of the wiper bracket support and are preferably integrally formed with both the collar and the rest of the support. The upper end of the wiper bracket support is provided with a recess 24, similar to the construction shown in Figs. 1 and 2, in which is positioned one end of a wiper bracket 43. The other end of the wiper bracket is positioned in a similar recess in the upper end of the other wiper bracket support, not shown in the drawings.

There is also provided means for rotating the dandy roll and for bringing it up to the speed at which the Fourdrinier wire is traveling. This is done by a simple form of water wheel of the impulse type, a type sometimes called a Pelton water wheel. At one end of the dandy roll a flanged head 20a is provided which has an axial length somewhat greater than that usually employed. That portion which is nearest to the dandy roll is rotatably supported by the ball bearing rolls 19 and the outer portion is provided with a plurality of buckets 72. This construction is best seen in Figs. 4 and 6. In Fig. 6 there is also shown the usual longitudinal rods 73 of the dandy roll, the circumferentially positioned winding wire 74 and the wire fabric 75. A jet of water for operating the water wheel is supplied by means of a nozzle 76 which is connected to a water pipe 77 having a valve 78 therein and which is in turn connected to a T 73 in the water supply pipe 58.

In operation, referring especially to the form of construction shown in Figs. 4 to 6, the valve 57 is turned to admit water under pressure from the supply pipe 58 into the pipe 56, through the passage 55, and into the interior of the cylinder 54, that is, into the chamber between the cylinder and the support 52 which acts as a stationary piston. The water pressure raises the cylinder or hub 54 at each end of the dandy roll until the pins 64 strike against the upper ends of the slot 63. The arms 17a and ball bearing rolls 19 are thereby lifted the same distance and carry with them the dandy roll. When it is desired to lower the dandy roll the valve 78 is opened thereby discharging a stream of water against the buckets 72. The force of the stream against the buckets gradually starts the dandy roll to rotating and when it has reached the same speed as the Fourdrinier wire the valve 57 is moved into the position which shuts off the supply pipe 58 and connects the pipe 56 to the waste pipe 59. This permits the water in the cylinders 54 to escape, the weight of the dandy roll forcing the water out through the waste pipe. The valve 78 may then be shut off.

In general the specific form of construction shown in Figs. 4 to 6 is especially adapted for use with dandy rolls that are heavy. The water pressure does all the work of raising the roll without requiring the exercise of any strength on the part of the operator. Likewise the dandy roll is brought up to proper speed without any manual effort. This form of construction is not necessarily confined to use with heavy rolls but its application to such rolls is especially valuable.

There are a number of advantages obtained by the forms of construction just described. In

the first place the use of a single pedestal or base for the support makes it possible for it to be used in many places where the available space for mounting the support is very limited. Furthermore the symmetrical disposition of the different parts with the center of the pedestal in the same vertical plane as the axis of the dandy roll eliminates most of the strains due to leverage which magnify the initial forces and altogether provides a sturdy and rugged construction. In this connection it is to be noted that the supporting yoke is moved directly up and down in a vertical direction.

In the form of construction shown in Figs. 1 to 3 it is to be noted that the cam shaft 25 and the wiper bracket 43 as well as all other parts are so mounted that any condensation or dripping therefrom will not fall on the paper web. In the case of the cam shaft and wiper bracket they are so positioned that they are above the dandy roll and any dripping will fall on the dandy roll which for such purpose serves as a protection to the paper web. The unusual compactness of the structure as above described is further evidenced by the fact that the means provided for the adjustment of the position of the dandy roll with respect to the Fourdrinier wire, the lifting mechanism, the ball bearing rolls and supporting arms for carrying the dandy roll, and the wiper bracket are all a part of the same unitary structure mounted on a single pedestal or base on each side of the machine.

While the forms of construction as hereinbefore set forth are now believed to be the best manner of practicing the invention it is to be understood that they have been selected for purposes of illustration only and various changes may be made therein without departing from the spirit and scope of the invention as set forth in the subjoined claims.

I claim:

1. In combination, a paper-making machine having machine rails on opposite sides thereof, a dandy roll positioned between said machine rails, a supporting pedestal at each end of said dandy roll, each pedestal comprising a single base secured to one of said rails and an upwardly extending portion, each pedestal also having a horizontal bearing in the upper portion thereof and a recess at the upper end thereof, a supporting yoke for each pedestal slidable up and down on said upwardly extending portion and having means for rotatably supporting one end of said dandy roll, a shaft extending between said pedestals and having its ends journaled in said bearings, an eccentric mounted on said shaft above each of said yokes, an eccentric strap carried by each eccentric, adjustable connections between said eccentric straps and said yokes, a wiper bracket extending between said pedestals and having its ends in said recesses, said bases, upwardly extending portions, yokes, shaft, connections, and wiper bracket all being in substantially the same vertical plane as the axis of said dandy roll.

2. Apparatus for supporting a dandy roll comprising a pedestal base positioned at each end of said roll, a stationary piston extending upwardly from each base, a movable cylinder positioned on each piston, means carried by each cylinder for rotatably supporting one end of said dandy roll, a wiper bracket pedestal detachably connected to each cylinder, a wiper bracket positioned above said dandy roll and extending between said wiper bracket pedestals, and connections to said cylin-

der for admitting fluid under pressure to simultaneously raise both ends of said dandy roll and said wiper bracket.

3. A supporting pedestal for a dandy roll comprising a base, a stationary piston extending upwardly from said base, a movable cylinder positioned on said piston, adjustable means in the head of said cylinder for limiting the movement thereof toward said piston, said piston having a vertical slot therein, a pin extending between opposite walls of said cylinder and through said slot to limit the upward movement of said cylinder with respect to said piston and to prevent rotative movement therebetween, and connections for admitting fluid under pressure into and for discharging fluid from the chamber between the piston and the head of the cylinder.

4. In apparatus of the character described, a base piece adapted to be secured to one of the machine rails of a paper-making machine, an upwardly extending cylindrical portion integral with said base piece, a supporting yoke having a hub in the form of a hollow cylinder closed at one end positioned on said cylindrical portion, a pair of arms extending outwardly from said hub, each arm carrying a ball bearing roll for rotatably supporting said dandy roll, an annular projection around the upper end of said cylindrical hub to provide a supporting shoulder, a wiper bracket supporting pedestal having a recess for a wiper bracket at its upper end and an annular band at its lower end detachably positioned on said shoulder, and means for securing said wiper bracket supporting pedestal to said hub.

5. In apparatus of the character described, a dandy roll, a plurality of water wheel buckets circumferentially disposed around one end of said dandy roll, a jet nozzle positioned to impinge a stream of water against said buckets, and connections for supplying water under pressure to said nozzle.

6. In a paper-making machine having a Fourdrinier wire and having machine rails on the opposite sides thereof, a dandy roll having bearing flanges at each end thereof of substantially the same diameter as the roll, said roll having an open interior from one end thereof to the other, a pair of bearing rolls in contact with the external periphery of each flange and symmetrically disposed with respect to the axis of the dandy roll for rotatably supporting said dandy roll, a supporting pedestal at each end of said dandy roll having a single base attached to the top surface of the adjacent machine rail of the paper-making machine, and a single unitary supporting yoke connecting each of said pedestals with the bearing rolls, said yoke comprising a hub vertically adjustable on the supporting pedestal and a pair of arms extending between said hub and the respective bearing rolls, and means for simultaneously moving said yokes vertically at the two ends of said dandy roll, said bearing rolls and yokes being positioned above said Fourdrinier wire and outside of the interior of said roll.

7. In a paper-making machine having machine rails on opposite sides thereof, a dandy roll of the open-end type having a bearing flange of substantially the same diameter as the roll at each end thereof, a supporting pedestal secured to the top side of one of said machine rails at each end of the dandy roll and positioned in the axis

thereof, a yoke for each of said pedestals comprising a hub vertically slidable on said pedestal and a pair of arms with separate bearing means at the ends thereof for rotatably supporting the outer periphery of the adjacent flange, the supporting pedestal and the two bearing means in a plan view being disposed at the three corners of a triangle, a supporting shaft positioned above said dandy roll and extending from one supporting pedestal to the other, and lifting means at each end of the dandy roll extending from said supporting shaft to said yoke at a point within said triangle close to the line connecting said bearing means whereby the vertical force acting on said lifting means and the weight on said bearing means substantially counter-balance each other with a minimum of twisting forces acting through said yoke on said pedestal.

8. In combination, a paper-making machine having a Fourdrinier wire and having machine rails on opposite sides thereof, a dandy roll positioned between said machine rails and having a bearing flange at each end thereof substantially the same diameter as the roll, a pair of supporting pedestals positioned in substantially the same vertical plane as the axis of said roll at the respective ends thereof and resting upon and secured to the top surfaces of said rails and extending upwardly therefrom, a supporting yoke for each pedestal having a sleeve within which the pedestal is positioned and whereby the yoke is vertically slidable on its pedestal, each yoke having a pair of arms extending therefrom in a substantially horizontal direction toward the adjacent bearing flange, means carried at the end of each arm and positioned beneath the outer surface of the adjacent bearing flange for rotatably supporting said dandy roll on the outer peripheral surfaces of its bearing flanges, and means for simultaneously raising and simultaneously lowering the yokes at the two ends of the dandy roll, said pedestal, yoke, and means for rotatably supporting the dandy roll all being positioned above the level of the Fourdrinier wire and outside of the interior of the dandy roll.

9. In combination, a paper-making machine having a Fourdrinier wire and a machine rail disposed along each lateral edge thereof, a dandy roll positioned above said wire and extending from one machine rail to the other, a single supporting pedestal in substantially the same vertical plane as the axis of the dandy roll at each end thereof, said dandy roll being supported solely on said pedestals, each pedestal having a base secured to the top of the machine rail, means for simultaneously lifting both ends of said dandy roll positioned substantially within the vertically projected confines of said pedestals and comprising a piston extending upwardly from each base, a movable cylinder positioned on each piston, means for limiting the upward movement of said cylinders and for preventing rotation between said cylinders and said pistons, adjustable means for limiting the movement of said cylinders towards said pistons, and connections for admitting fluid under pressure into the cylinders above said pistons, each end of said dandy roll having means for rotatably supporting said end connected with the movable cylinder adjacent thereto.

PETER S. SINCLAIR.