No. 817,025. PATENTED APR. 3, 1906.

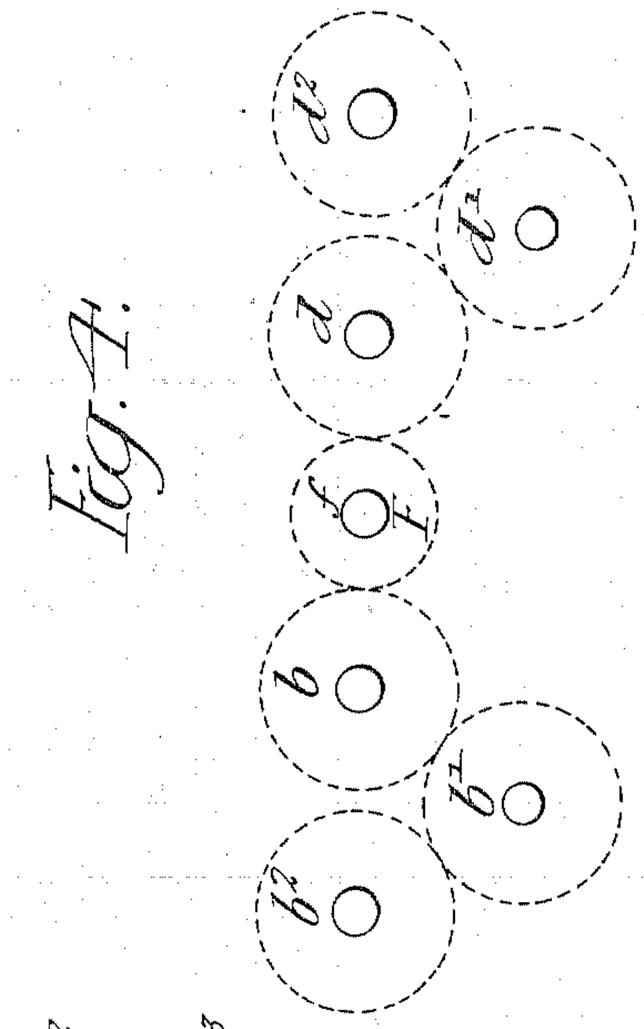
J. A. WHITE.

PAPER WINDING MACHINE.

APPLICATION FILED NOV. 21, 1904.

3 SHEETS—SHEET 1.

Fig. 4.



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3 SHEETS—SHEET 2.

Fig. 2.

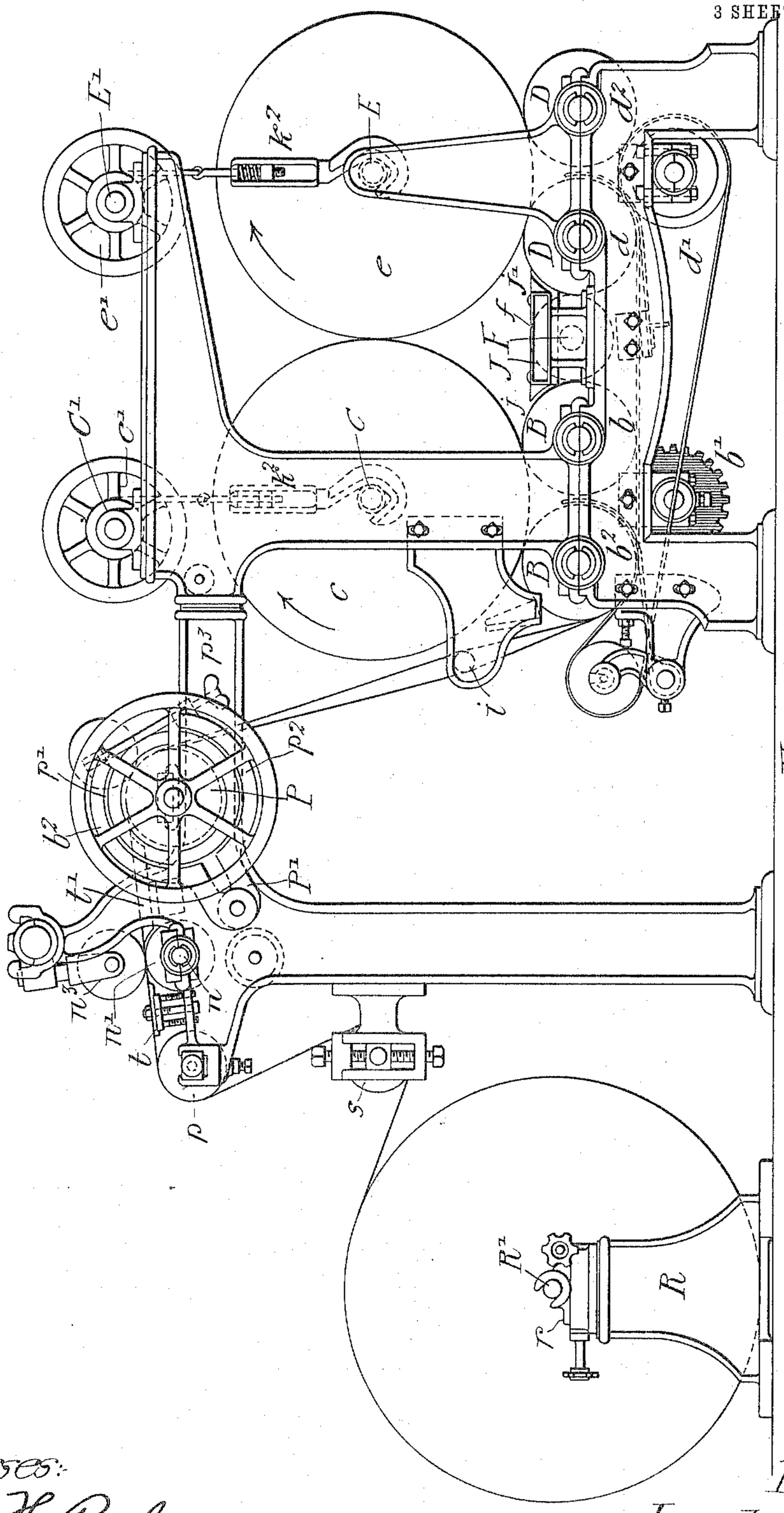
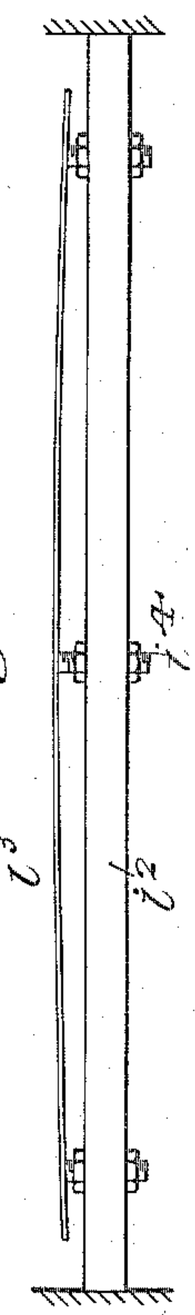


Fig. 5.



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Augustus B. Copper

Inventor
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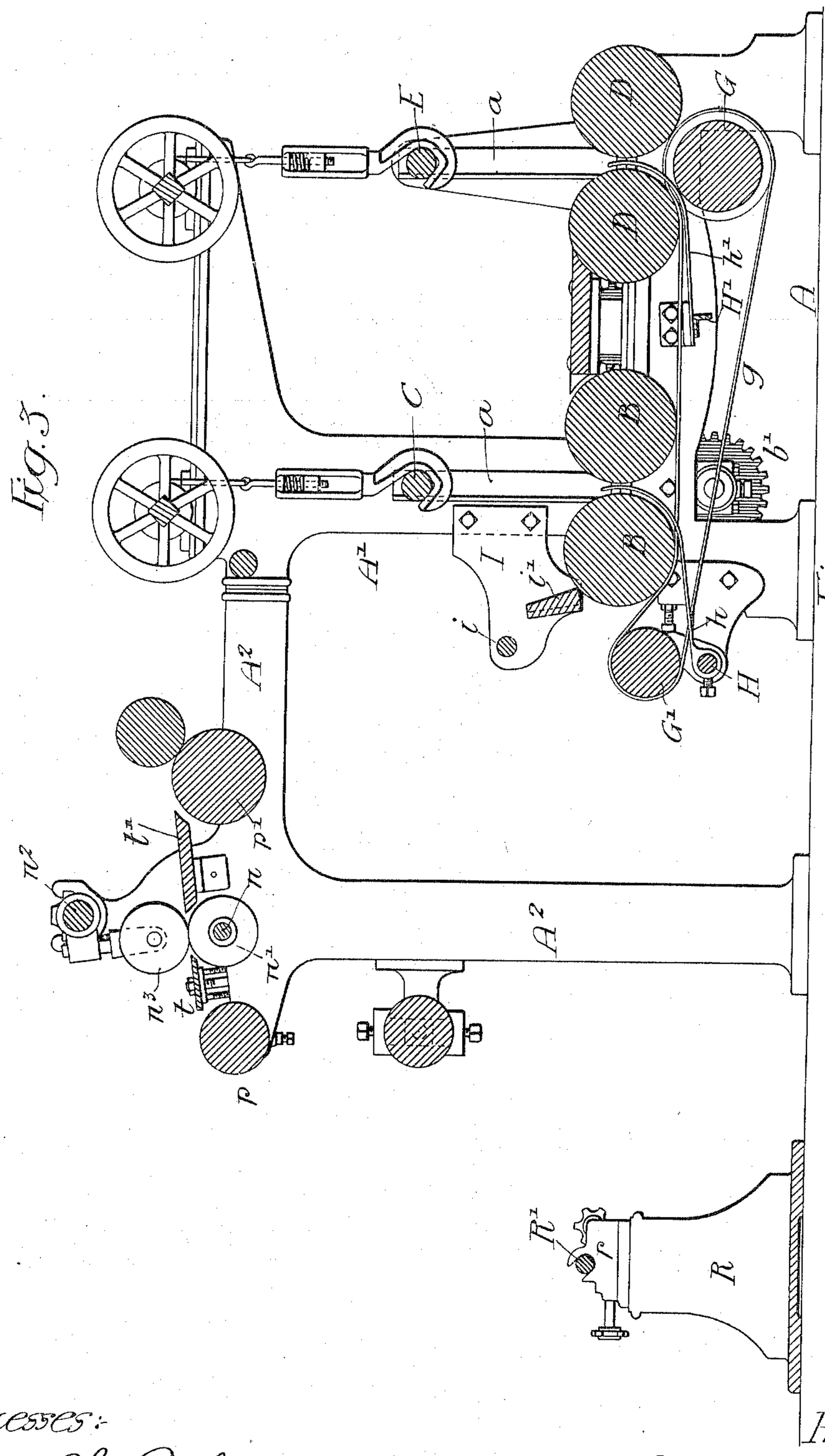

Fig. 5.

Fig. 6.

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UNITED STATES PATENT OFFICE.

JOSEPH A. WHITE, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO THE MOORE & WHITE COMPANY, OF PHILADELPHIA, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

PAPER-WINDING MACHINE.

No. 817,025. Specification of Letters Patent. Patented April 3, 1906.

Application filed November 21, 1904. Serial No. 233,681.

To all whom it may concern:

Be it known that I, JOSEPH A. WHITE, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain Improvements in Paper-Winding Machines, of which the following is a specification.

The main object of my invention is to so construct a paper-winding machine that it will accurately wind paper in a compact and even roll and which can wind a number of rolls at the same time.

A further object of the invention is to combine the mechanism with a cutting-machine, so that the paper, either taken from a large roll or direct from the paper-making machine, can be split up into any number of sections and made up into any number of rolls, as fully described hereinafter.

Referring to the accompanying drawings, Figure 1 is a front view of my improved paper-winding machine. Fig. 2 is a side view. Fig. 3 is a longitudinal sectional view on the line 3 3, Fig. 1. Fig. 4 is a diagram view of the gearing. Fig. 5 is a view of a guide-bar that can be used on this machine, and Fig. 6 is a perspective view of one of the mandrels with the loose sleeve.

In the present instance I have shown a double-drum winding-machine for winding two independent rolls at the same time.

A is the frame of the winding-machine.

B B are the carrying-rolls for supporting the roll of paper *c* as it is wound upon a mandrel C, and D D are the supporting-rolls for the roll of paper *e*, rolled upon the mandrel E.

F is a driving-shaft having a gear-wheel *f*. (Shown by dotted lines in Fig. 2 and in the diagram, Fig. 4.) This wheel meshes with gear-wheels *b* and *d* on one of the pairs of rolls B and D, respectively. The gear-wheel *b* in turn meshes with an intermediate *b'*, and this intermediate meshes with a gear-wheel b^2 on the other drum B of the pair, while the gear-wheel *d* meshes with an intermediate *d'*, which in turn meshes with a gear-wheel d^2 on the other drum D of the pair, so that as the paper is rolled upon the mandrels C and E it will turn in the direction shown by the arrows, Fig. 2.

Carrying-belts *g* pass around rolls G and G', the roll G being on the shaft of the intermediate gear-wheel *d'*, so that it is a driven shaft. The upper runs of the belts *g* are the carrying-runs and travel in contact with one of the rolls B and D, as clearly shown in Fig. 3.

As indicated in Fig. 1, the belts *g* are spaced apart sufficiently to admit guiding-plates *h h'*, which alternate with the belts and are curved so as to pass up between the carrying-rolls. The guides *h* pass up between the rolls B B, and the guides *h'* pass up between the rolls D D. The guides *h* are adjustably secured to the cross-bar H, which is mounted on the frame of the machine, while the guides *h'* are secured to an angle-bar H', attached to the frame of the machine.

Carried by brackets I, secured to the standard A' of the frame A, is a separating bar or roll *i*, which separates the paper as it comes from the slitting-machine. Carried also by the brackets I is a scraper *i'*, which prevents the paper passing entirely around the roll B, and mounted between the two sets of rolls is a frame J, having scrapers *j j'*, resting against the rolls B and D, respectively, also for the purpose of preventing the paper passing around the rolls.

The mandrels C and E, upon which the paper is to be rolled, are suspended from shafts C' and E', respectively. These shafts are square in cross-section, as shown in Fig. 3, and mounted on the shafts are handled sprocket-wheels *c'* and *e'*, respectively. Attached to these wheels are chains *k k*, having hooks *k'* at their lower ends. The hooks are coupled to the chains by an adjustable and yielding coupling k^2. The sprocket-wheels and their hooks can be shifted to any position on their shafts according to the width of paper to be wound upon the spindle.

The mandrels C and E are guided by vertical angle-plates *a a*, secured to the frame of the machine. These angle-plates allow freedom of motion in one direction, but prevent the mandrel rolling past a certain point in the opposite direction. When the paper is wound upon the mandrels, the mandrels and the paper rolled thereon can be readily removed from the front of the machine.

On one end of each shaft is a scroll chain-wheel L, to which is attached a chain *l*, carrying at its lower end a weight *l'*. This weight

balances the weight of the paper as it is rolled upon the mandrel, and the scroll-wheel is so secured to the shaft that as the shaft is turned the hooks will accommodate the mandrel and the weight will be moved away from the vertical center line, thus increasing the counterbalancing-weight upon the shaft as the weight of the roll increases. On the opposite end of each shaft C′ and E′ is a ratchet-wheel l^2, and hung from each shaft is a lever L′, having a weighted pawl l^3. The pawl is held normally out of engagement with the ratchet-wheel by its weight; but when shifted it engages the wheel and will turn the shaft to raise or lower the mandrel and the roll of paper thereon.

I have shown in the drawings a slitting-machine combined with the winding-machine, as in most instances the winding-machine will be built in conjunction with a slitting-machine, and therefore I have made an extension-frame A^2, which is securely bolted to the standard A′ of the frame A, and in the frame are bearings for the shaft n of the circular slitting-disks n' and for the cross-bar n^2, carrying the disks n^3, and the frame also has bearings for the guide-roll p and the friction-roll P. On the spindle of this friction-roll is a brake-wheel p', to which can be applied a friction-brake P′, consisting in the present instance of two semicircular arms p^2 and an adjusting-bolt p^3.

Mounted on the floor in front of the slitting-machine are standards R, having bearings r, which are shaped to receive the mandrel R′ of the roll of paper to be cut. The paper passes from this roll around a guide-wheel s, hung in any suitable manner, then around the guide-roll P, over an adjustable platform t, past the slitters n' n^3, over the table t', and around the friction-drum P. The slitters can be adjusted longitudinally, so as to slit the paper into any number of strips desired.

The paper passes the separator-bar i, and the strips of paper that are intended to be wound upon the first mandrel C are guided on the inner side of the separator-bar, while the paper intended to be wound on the mandrel E passes on the outer side of the bar, and I so separate the rolls that one set of strips is wound on one mandrel and the strips alternating with them are wound on the other mandrel, thus spacing the different rolls a sufficient distance apart to prevent them interfering one with the other, as it will be understood that if some provision is not made for the separation of the rolls after the paper is slitted the edges are liable to overlap, producing an uneven and torn edge.

The guides h are so adjusted on the bar H that they will direct the paper which is intended for the mandrel C around the roll b^2 and up between it and the roll b, while the other strips of paper not being deflected by the guide will be carried on the belts g to the roll d, and the guides h' will direct the paper up between the rolls D D, so that it can be wound upon the mandrel E.

The mechanism for driving the machine in the present instance is as follows: The driving-shaft F is mounted in suitable bearings q q and has a clutch-pulley Q thereon. q' is the movable portion of the clutch, which can be thrown into frictional contact with the clutch-pulley by any suitable lever mechanism. Splined to the shaft F is a clutch-head S, which is arranged to engage a clutch-head S′ on the sleeve, to which is secured a gear-wheel s'. The engaging faces of the clutch are so arranged that the clutch is positive in one direction and slips in the opposite direction. When the shaft F is at rest and the clutch-disk S is shifted by any suitable lever mechanism into engagement with the clutch-face S′, it will be driven by said clutch-face S′; but when the speed of the shaft F is increased by power applied through the clutch q' then the clutch-head S will be thrown out of gear. The clutch-head S′ is driven through the gear-wheel s', the pinion s^2 on the shaft S^2, mounted in the bearings q, and the gear-wheel s^3 on the opposite end of said shaft S^2, which meshes with a pinion s^4 on a sleeve mounted on the shaft F, which carries the friction-pulley Q. A suitable driving-belt passes around this friction-pulley Q, and through it the power is transmitted to the machine. By this means I am enabled to start the machine at a slow speed until the paper is being wound correctly on the mandrels, and then when the machine is working correctly the high speed can be thrown in, so as to more quickly wind the paper. I preferably mount independent cores or sleeves on each of the mandrels C and E for each independent roll of paper, as shown in Fig. 6. By this means each roll is free to revolve independently of the other roll, so that in the event of one roll being somewhat smaller than the other the difference in diameter will not affect the proper winding of the paper, whereas if they were all mounted on a single mandrel they would turn in unison and the circumference of all the independent rolls would have to be the same, and if not the paper of the several rolls would either buckle or split.

By hanging the mandrels on independently-adjustable supports I am enabled to adjust the mandrels to different thicknesses of paper, as in some instances the paper may be thinner at one side than at the opposite side or two independent rolls may be mounted to be slit at the same time, one of a different thickness than the other, and by making the hangers independently adjustable I can place sufficient friction upon each roll of paper that it will be properly wound into a solid compact roll.

By my machine I am enabled to slit the paper accurately and wind it in any number of

separate rolls of any width desired, and the rolls of paper will have even edges and will be solid throughout.

When it is desired to roll paper on one mandrel only, then instead of the separator-bar i I may use an adjustable spreader-bar i^2, Fig. 5, having a plate i^3 and adjusting-screws i^4, so when the slit paper passes in contact with the plate of the bar the strips will separate and there will be clearance between the rolls of paper on the mandrel.

I claim as my invention—

1. The combination in a paper-winding machine, of a pair of rolls for supporting the paper to be rolled, a series of belts for guiding the paper under one of the rolls, guides for directing the paper between the rolls, and means for supporting the mandrel upon which the paper is to be rolled, substantially as described.

2. The combination of two sets of rolls, two mandrels, one above each set of rolls, endless belts carrying the paper, and guides for directing the paper between each set of rolls, the guides being so set that one portion of the paper will be passed between one set of rolls and wound upon one mandrel and other portions of paper will be guided between the other pair of rolls mounted upon the other mandrel, substantially as described.

3. The combination in a paper-winding machine, of two sets of winding mechanism, a roll around which the strips of paper pass to both sets of winding mechanism, a separator-bar situated in advance of said roll so as to separate the paper in order that the paper intended for the first set of winding mechanism will pass on that side of the separator next to the roll, substantially as described.

4. The combination in a paper-winding machine, of two sets of rolls, an endless belt arranged to feed the paper to the rolls, a guide for directing the paper to the first pair of rolls, and a separator-bar for separating the paper as it is fed to the machine, the said guides being adjustable, substantially as described.

5. The combination in a paper-winding machine, of two sets of rolls, means for driving the rolls, a series of endless belts passing under the rolls, adjustable guides for the first pair of rolls, guides for the second pair of rolls, means for supporting the mandrels upon which the paper is to be wound, guides for the mandrel, and a separator-bar for separating the paper so that the paper intended for the first pair of rolls will be on one side of the bar and the paper intended for the second pair of rolls will be on the other side of the bar, substantially as described.

6. The combination in a paper-winding machine, of a pair of rolls upon which the paper is fed, a mandrel upon which the paper is wound, a shaft, means for supporting the mandrel from the shaft, a scroll-wheel on one end of the shaft, and a weight suspended from the wheel, substantially as described.

7. The combination in a paper-winding machine, of means for slitting the paper, two winding mechanisms, one situated in advance of the other and each consisting of two sets of rolls, the paper passing around the roll of the first set of winding mechanism, a separator-bar situated between the said roll and the slitting mechanism so as to separate the slit paper, the portions intended for the first roll passing on that side of the separator next to the said roll, substantially as described.

8. The combination in a winding-machine, of a pair of supporting-rolls, two or more cores independently mounted upon said rolls and arranged to turn independently, means for maintaining said cores in position against longitudinal movement, the paper being independently wound upon the cores by friction from the supporting-rolls, substantially as described.

9. The combination in a winding-machine, of a pair of supporting-rolls, two or more cores independently mounted upon said rolls, a mandrel passing through said cores, said cores arranged to turn independently, means for guiding said mandrel and for maintaining said cores in position against longitudinal movement, the paper being independently wound upon the cores by friction from the supporting-rolls, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOSEPH A. WHITE.

Witnesses:
WILL. A. BARR,
JOS. H. KLEIN.