

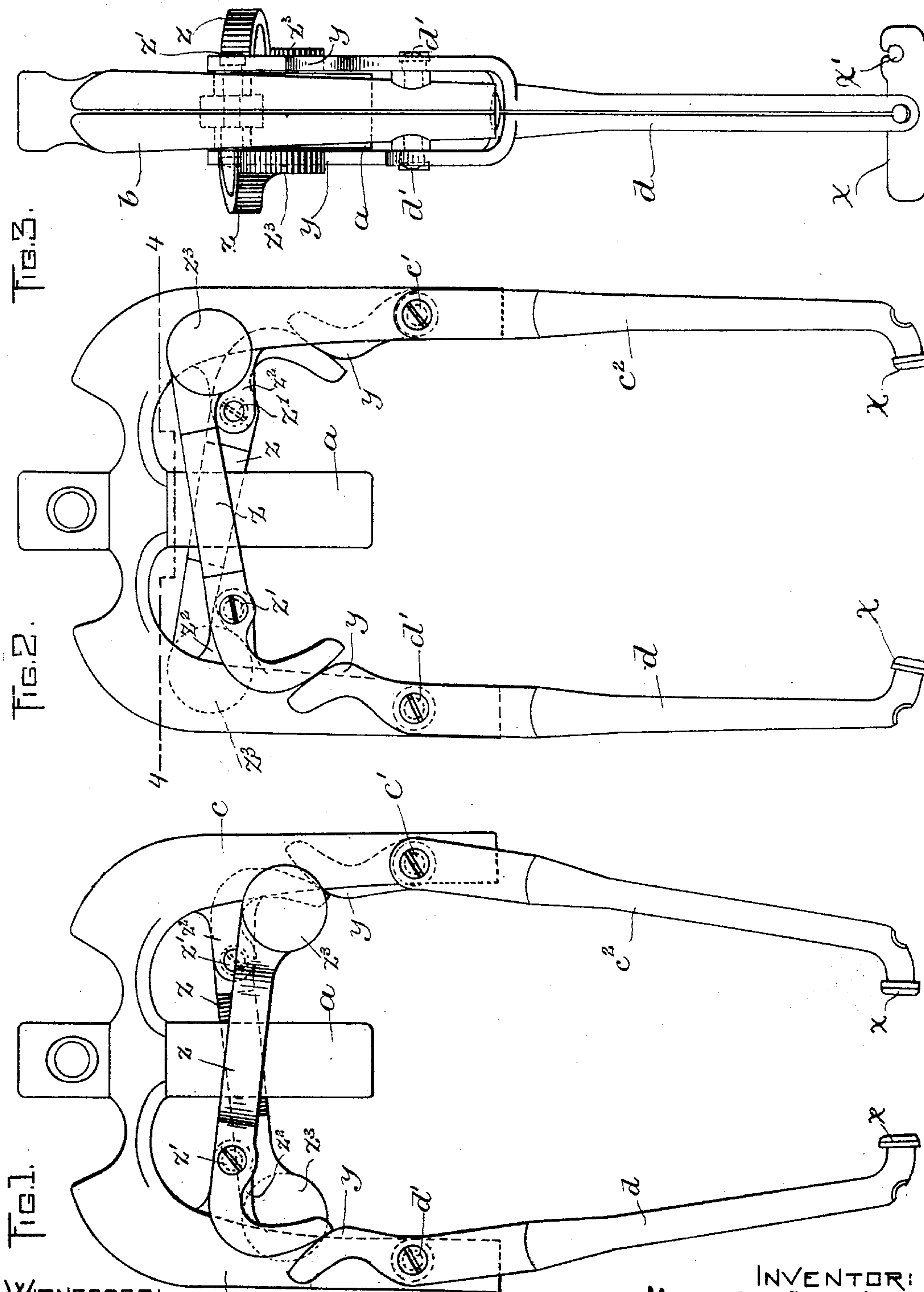
No. 803,666.

PATENTED NOV. 7, 1905.

M. CAMPBELL.
FLIER FOR ROVING MACHINES.

APPLICATION FILED JAN. 3, 1902.

2 SHEETS—SHEET 1.



WITNESSES:
P. M. Pezzetti
W. C. Stecher

INVENTOR:
Malcolm Campbell
by *Wright Brown* Attorney
his atty

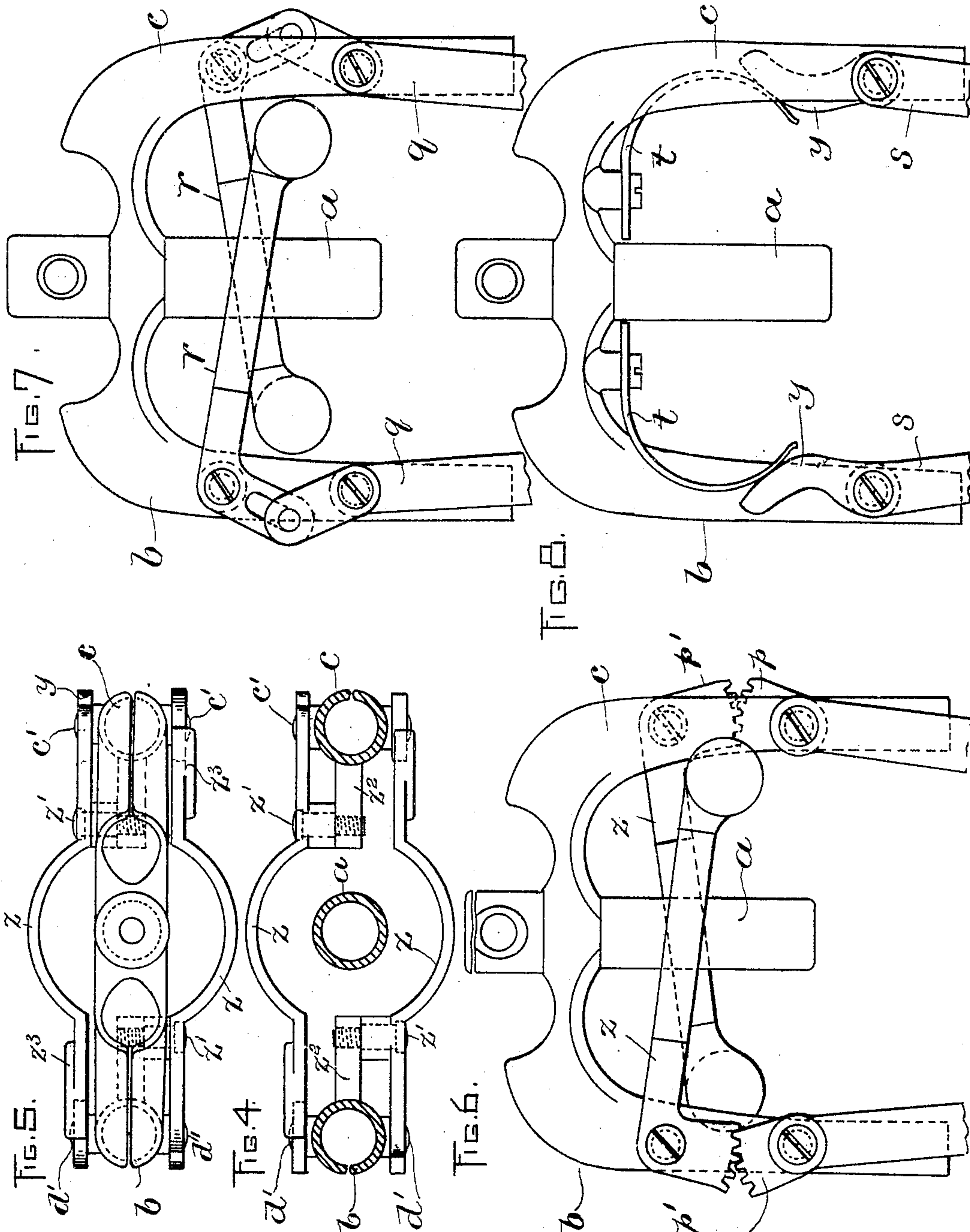
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P. M. Pezzetti.
C. C. Stecher

INVENTOR:
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by Elmer Brown Dwyer
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UNITED STATES PATENT OFFICE.

MALCOLM CAMPBELL, OF BOSTON, MASSACHUSETTS.

FLIER FOR ROVING-MACHINES.

No. 803,666.

Specification of Letters Patent.

Patented Nov. 7, 1905.

Application filed January 3, 1902. Serial No. 88,330.

To all whom it may concern.

Be it known that I, MALCOLM CAMPBELL, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Fliers for Roving-Machines, of which the following is a specification.

This invention has relation to fliers for roving-machines, and has for its object to remedy the defects found in such devices and to provide certain improvements therein by means of which the yarn will be built upon the bobbin more evenly than has heretofore been possible. It has been customary to provide the flier with a finger supported upon the thread-carrying arm and having its free end resting upon the bobbin or the yarn thereon, so as to move outward as the bobbin is filled. While this contrivance has in a measure served its purpose in laying the yarn upon the bobbin, yet it has been objectionable in that it has not been possible to build the yarn upon the bobbin with the same degree of compactness throughout by the use thereof. This has been due to the fact that as the end of the finger was moved radially outward, owing to the accumulation of yarn on the bobbin, the tendency of the finger to fly outward under centrifugal action increased more and more, and consequently the pressure of the finger upon the yarn decreased to the same extent, whereby the yarn upon the bobbin decreased in compactness as it increased in depth or thickness. It has therefore been the practice to mount the presser-finger upon one side of the flier and to weight the opposite side of the flier for the purpose of counterbalancing said finger. This expedient has not proved entirely satisfactory, since the movement of the finger outward or inward destroys the balance and causes the flier to "chatter" upon its bearings and to rotate "out of true."

For the purpose of remedying the evils to which reference has been specifically made the present invention contemplates the employment of a differential pressure device for exerting a variable leverage on the finger and counterbalancing the increased centrifugal force as the yarn increases upon the bobbin and the finger is moved outward, in consequence of which the pressure of the free end upon the bobbin and the yarn thereon remains constant at all times, whether the bobbin be relatively full or empty.

The invention further contemplates the employment of a movable counterbalance for the

finger and the differential pressure mechanism, so that the flier remains at all times perfectly balanced and is thereby enabled to rotate evenly and uniformly.

Referring to the drawings, Figure 1 represents a flier constructed in accordance with my invention as it appears when operating upon an empty bobbin. Fig. 2 represents the same with the finger in position to accommodate a full bobbin. Fig. 3 represents an edge view of the same. Fig. 4 represents a section on the line 4 4 of Fig. 2. Fig. 5 represents a plan view of the flier. Figs. 6, 7, and 8 represent other embodiments of the invention.

Referring to the drawings, a indicates the flier-spindle, having the two arms b c , which are exact counterparts of each other, each being hollow for the reception of the roving and its passage therethrough.

d represents a finger which is bifurcated or forked to straddle the arm b , being fulcrumed upon the studs d' , extending laterally from the said arm. Upon the studs c' on the arm c is similarly mounted or fulcrumed a finger e^2 , which is exactly similar to that at d . The two fingers d and e^2 are each provided on their free ends with a curved flattened tip x to rest upon the yarn which accumulates upon the body, each tip being provided with a thread-eye x' , through which the yarn may be passed from the hollow finger d or e^2 , as the case may be. Each finger is relatively long, so that as the yarn accumulates upon the bobbin it may move outward from the position shown in Fig. 1 to that shown in Fig. 2, the yarn in the meantime passing through one of the fingers and the hollow arm on which the finger is fulcrumed. Each of the fingers is provided with an upward extension y , having a cam-surface to bear against the cam edge of a lever z . Each of the said levers z is fulcrumed upon a stud z' , attached to one of the arms b or c , said levers extending in opposite directions, as shown in Figs. 4 and 5, and being curved outwardly to accommodate the bobbin and the yarn thereon. The stud z' is in each case threaded into a lug z^2 , projecting inwardly from the arm. Upon the longer end of each of the levers z there is a weight z^3 , which when the parts are at rest throws the longer end of the finger d or e^2 , as the case may be, toward the position shown in Fig. 1 or toward the center of gravity of the flier. The contacting edges or surfaces of the lever z and the extension y of the finger are such that the point of contact when the tip is moved

inward as against an empty or nearly empty bobbin is relatively near the stud d' or c' , as the case may be; but as the said finger-tip moves outward the point of contact recedes
 5 from the said studs and approaches the studs z' , so that although the weighted end of the lever z is raised in each case, yet the leverage of the finger upon the lever z decreases gradually, and greater force is therefore necessary to raise the weight z^3 as the finger d or
 10 c^2 moves outward from the center of the bobbin or away from the center of gravity of the flier. Therefore as the centrifugal force increases with the outward movement of each
 15 of the fingers it is offset or balanced by the increase in power necessary to raise the weighted end of the lever z , and therefore the tip x of each of the fingers rests upon the bobbin with a constant pressure. The yarn may
 20 be passed through either of the arms and fingers, the other arm and finger exactly counterbalancing the one first mentioned, so that as the finger d swings outward and the weight z^3 of one of the levers z is raised the finger
 25 c^2 will likewise swing outward to raise the other weight, there being thus provided a true balance, which enables the accurate and even rotation of the flier.

In Fig. 6 each of the fingers is provided
 30 with an eccentric gear-segment p , intermeshing with a segment p' on the lever z . The pitch-line of each segment is an involute curve, so that as the finger swings outward the pressure necessary to raise the weighted lever in-
 35 creases.

In Fig. 7 the fingers q and the weighted levers r have a pin-and-slot connection by which the same results may be accomplished as when the fingers and levers are provided with the
 40 contacting cam-surfaces.

In Fig. 8 each finger s has the cam extension y , similar to that shown in Fig. 1, there being a leaf-spring t bearing against the edge of the said extension, the engaging surface or
 45 edge of each finger being so formed that as the finger-tip swings outwardly the point of contact of the spring with the said edge moves toward the fastened end of the spring to increase the tension of the latter.

It will be observed that in all of the cases referred to the parts are accurately balanced and that there is a variable leverage mechanism or differential pressure device for exerting a variable leverage on the finger and counterbalancing the increased centrifugal force as the free end of the finger moves outward, due to an increased accumulation of yarn on the bobbin.

Having thus explained the nature of the invention and described a way of constructing and using the same, although without attempting to set forth all of the forms in which it may be made or all of the modes of its use, I declare that what I claim is—

65 1. A flier for roving-machines having a fin-

ger whose free end is adapted to rest upon the bobbin or the yarn thereon, and variable leverage mechanism for counterbalancing the increased centrifugal force as the free end of the finger moves outward, due to an increased
 70 accumulation of yarn on the bobbin.

2. A flier for roving-machines having a finger whose free end is adapted to rest upon the bobbin or the yarn thereon, and a differential pressure device exerting a variable lev-
 75 erage on said finger whereby the pressure of the free end of said finger on the yarn on the bobbin remains constant irrespective of the depth of the yarn on the bobbin.

3. A flier for roving-machines having a piv-
 80 oted finger whose free end is adapted to rest upon the bobbin or the yarn thereon, and a differential pressure device arranged across the top of the flier and engaging said finger, the point of contact between said device and
 85 said finger varying as the free end of the finger moves outward.

4. A flier for roving-machines having a finger whose free end is adapted to rest upon the bobbin or the yarn thereon, and a weight-
 90 ed lever engaged with said finger, with provisions whereby the leverage of said finger on said weighted lever decreases as the free end of the finger moves outward from the center of the bobbin.
 95

5. A flier for roving-machines having a finger whose free end is adapted to rest upon the bobbin or the yarn thereon, and a weighted lever having a fixed pivotal relation to said
 100 finger but having a point of contact with said finger which approaches the pivot of said lever as the free end of said finger moves outward.

6. A flier having an arm, a finger pivoted on said arm, and a weighted lever pivoted on
 105 said arm and having a point of contact which approaches the lever-pivot as the free end of the finger moves outward.

7. A flier having an arm, a finger pivoted on said arm, and a lever pivoted on the arm
 110 having a weight at its free end, said finger bearing against the weighted lever.

8. A flier having a pivoted finger and a pivoted weighted lever extending across the top of the flier, said finger engaging said lever
 115 lifting the weight thereon as said finger moves outward.

9. A flier for roving-machines having a pivoted finger whose free end is adapted to rest upon the bobbin or the yarn thereon, and
 120 movable means, moving toward or from the center of gravity coincidently with the said finger to balance the same.

10. A flier for roving-machines having a finger whose free end is adapted to rest upon
 125 the bobbin or the yarn thereon and to move outward as the yarn accumulates, and means attached to the flier diametrically opposite the said finger and having provisions for moving
 130 toward or from the center of gravity coinci-

dently with the movement of the said finger for counterbalancing the same.

11. A flier for roving-machines having two opposite pivoted arms which are counterparts of each other, and a finger pivoted to each arm whereby its tip is adapted to rest upon the bobbin or the yarn thereon, said fingers being counterparts of each other and adapted to simultaneously move toward or from the center of gravity, whereby the flier is balanced.

12. A flier for roving-machines having oppositely-disposed similar arms, a finger pivoted to each arm, and means for engaging one end of each arm for counterbalancing the increased centrifugal force as the other end of

each finger moves outward, each arm and finger and each counterbalancing means being similar to the other arm, finger, and counterbalancing means respectively.

13. A flier for roving-machines having a pivoted pressure-finger with provisions for engaging one end of said finger, whereby the flier is balanced irrespective of the movement of said finger relative to the center of gravity.

In testimony whereof I have affixed my signature in presence of two witnesses.

MALCOLM CAMPBELL.

Witnesses:

M. B. MAY,

C. C. STECHER.