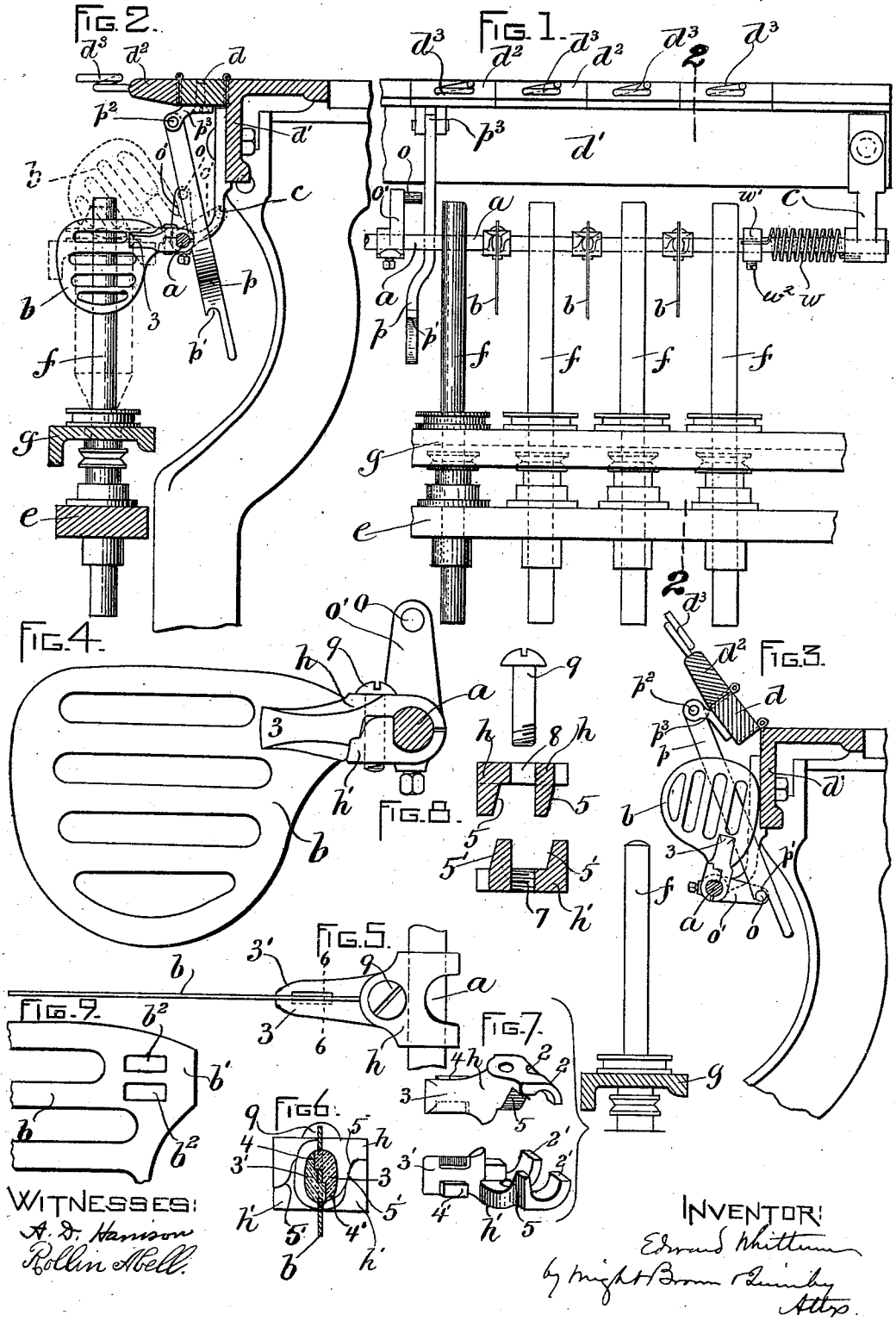
(No Model.)

E. WHITTUM.

SEPARATOR MECHANISM FOR SPINNING MACHINES.

No. 540,526. Patented June 4, 1895.



WITNESSES:
A. D. Harrison
Rollin Abell.

INVENTOR:
Edmund Whittum
by Wright Brown Quinby & Atty's.

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UNITED STATES PATENT OFFICE.

EDWARD WHITTUM, OF FALL RIVER, ASSIGNOR TO GEORGE DRAPER & SONS, OF HOPEDALE, MASSACHUSETTS.

SEPARATOR MECHANISM FOR SPINNING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 540,526, dated June 4, 1895.

Application filed August 1, 1894. Serial No. 519,161. (No model.)

To all whom it may concern:

Be it known that I, EDWARD WHITTUM, of Fall River, in the county of Bristol and State of Massachusetts, have invented certain new and useful Improvements in Separator Mechanism for Spinning-Machines, of which the following is a specification.

This invention relates, first, to the separator blades of a spinning machine and to means for securing the same to the rod or shaft which supports them.

The invention also relates to means for temporarily holding the blades when they are thrown back from between the spindles, so that they may be kept out of the way during the doffing operation.

The invention has for its object, first, to provide a light and durable separator blade adapted to be struck up from sheet metal by one operation; secondly, to provide a simple and inexpensive clamp adapted to secure said blade to the separator-rod, and of such construction that its parts may be prepared for use by casting and will require no machine work, and, thirdly, to enable the weight of the hinged thread-board to be utilized in holding the separator blades raised and thrown back from between the spindles during the doffing operation.

To these ends, the invention consists in the improvements which I will now proceed to describe and claim.

Of the accompanying drawings, forming a part of this specification, Figure 1 represents a front elevation of a portion of a spinning-frame provided with my improvements. Fig. 2 represents a section on line 2 2 of Fig. 1. Fig. 3 represents a view similar to Fig. 2, showing the separator-blades held in an elevated and thrown-back position by the weight of the thread-board. Fig. 4 represents a side view of a portion of one of the blades and the clamp that secures it to the separator-shaft. Fig. 5 represents a top view of the parts shown in Fig. 4. Fig. 6 represents a section on line 6 6 of Fig. 5. Fig. 7 represents a perspective view showing the parts of the clamp separated. Fig. 8 represents a sectional view showing the parts of the blade-clamp separated from each other.

In the drawings, a represents the rod or shaft which supports the separator-blades b. Said rod is mounted to turn in bearings in brackets c which are attached to the roller beam d' of the frame of the machine.

d represents the thread-board, which is hinged to said beam, as usual, and has the usual independently hinged sections d^2 to which the yarn-guiding eyes d^3 are secured.

e represents the fixed bolster-rail supporting the bolsters in which the spindles f are journaled.

g represents the ring-rail, which has the usual vertical traverse up and down the spindles.

The separator blades are adapted to oscillate in vertical planes, and are formed and arranged so that when at the lowest extreme of their movement they stand between the upper portions of the spindles, as shown in full lines in Figs. 1 and 2. The blades therefore are about midway between the ring-rail g and the guide-eyes d^3 when the ring-rail is depressed so that they are interposed between the ballooning portions of the yarn between the spindles at the points where the ballooning is greatest, and effectually separate the strands of yarn passing to each spindle from the strands passing to the other spindles.

The separator-rod or shaft a is loosely mounted in its bearings, so that as the ring-rail rises and strikes the lower edges of the blades it raises the latter, as indicated in dotted lines in Fig. 2, the blades resting on the rail and rising and falling therewith.

Each blade b consists of a flat blade of sheet steel or other suitable metal having the same general form as to its body portion as the blade shown in Letters Patent No. 504,954, granted to me September 12, 1893. The shank-portion b' of the blade b, instead of being bent at right angles with the plane of the blade, as shown in said patent, is simply an extension of the blade, and lies in the same plane with it. Said shank has two orifices b^2 b^2 formed in it for the reception of tenons or projections on the clamping members hereinafter described.

h h' represent the said clamping members, which are formed to grasp simultaneously the separator-rod a and one of the blades b, the member h having the shaft-grasping jaws 2 2

and the blade-grasping jaw 3; while the member h' has shaft-grasping jaws 2′ 2′ and a blade-grasping jaw 3′. The jaws 2 2 and 2′ 2′ are formed to fit the shaft a^6, the latter having a flattened side, as shown in Fig. 4, so that the clamping members are prevented from turning or slipping on the shaft, the jaws above described having flat faces which bear on said flattened side. The inner sides of the jaws 3 3′ are provided respectively with the inwardly-projecting tenons 4 4′ above mentioned, which enter the orifices b^2 b^2 of the blade. The member h has two inclined seats or faces 5 5, and the member h' has two correspondingly inclined faces 5′ 5′ (see Fig. 8), said faces being so arranged that when two members are brought together, the faces will co-operate in bringing the jaws 3 3′ together, giving each jaw a lateral movement which will bring the inner sides of said jaws to a bearing upon the sides of a blade-shank interposed between them, and at the same time cause the tenons 4 and 4′ on said jaws to enter the slots b^2 in the shank. The member h' is provided with a screw-threaded orifice 7, and the member h with a corresponding orifice 8, said orifices being in line with each other and arranged to receive a screw 9 which unites the two members, the screw being formed to engage the thread of the orifice 7.

It will be seen that the screw 9 serves to secure the clamping members both to the shaft a^6 and to the blade b, the operation of turning the screw inwardly pressing the jaws 2 2 and 2′ 2′ toward each other and at the same time causing the co-operation of the inclined faces 5 and 5′ in such manner as to close the jaws 3 and 3′ upon the sides of the blade and force the tenons into the slots of the blade. The blades may be, therefore, very quickly and securely connected with the shaft a^6, the form of the shaft and of the jaws that embrace it preventing the turning of the clamp upon the shaft, while the engagement of the tenons of the clamp with the slots in the blade insures a rigid engagement of the blade by the clamp.

The parts or members of the clamp are adapted to be formed ready for use by casting, no machine work or other labor being required, excepting the cutting of a screw-thread in the orifice 7. Hence the clamp may be very economically manufactured.

If desired, the clamp may be used for connecting flat shanks or arms on other devices, such as thread-guides, to a shaft supporting said devices.

While doffing the bobbins, it is desirable that the separator blades be thrown back from their position between the spindles, as shown in Fig. 3, so that said blades will not obstruct the spindles while the bobbins are being applied and removed. It is a common practice by attendants of spinning-machines to hold the separator blades in the raised position shown in Fig. 3 by interposing a bobbin or other prop between one or more of the blades and an adjacent spindle or spindles, thus causing the weight of the raised blades to be supported by said spindle or spindles, and often bending the latter out of its proper position. To prevent this liability, I have provided the separator shaft a with an arm or projection o, which is preferably a pin rigidly secured to said shaft by means of a crank-arm o' affixed to the latter, and have also provided the thread-board with a hinged depending dog p having a notch or shoulder p' formed to engage said projection o when both the thread-board and separators are raised or displaced from their operative positions, the dog being elongated so that the shoulder p' is below the arm or projection o when the blades and thread-board are in operation. When the separator blades are thrown back, the projection o will be depressed and in such position that when the thread-board is raised the dog p will engage said projection, and thus cause the weight of the thread-board to bear upon the projection o and hold the separator-shaft and blades in the elevated position shown in Fig. 3. The dog is connected by a pivot p^2 with an ear or bracket p^3 affixed to the thread-board d. I prefer to arrange the dog p and the projection o at about the center of the machine, in order that they may co-operate to the best advantage in the manner above described.

It will be observed that the inclined faces 5 and 5′ on the clamp members co-operate with the clamp-connecting device or screw 9 in engaging the jaws 3 and 3′ with the separator blade, while the jaws 2 2′ are engaged with the shaft or rod a^6 by the direct action of said connecting device. I do not limit myself to the employment of two inclines on each clamp member, as it will be obvious that the same result will be produced by one incline on each member.

The separator blades may be moved vertically by any other suitable actuating mechanism other than the ring-rail, my invention not being limited to the described loose mounting of the separator-shaft a and the operation of the separators by the ring-rail.

It will be seen that the separator-blade, being made in a flat piece, without offsets, both the blade and the shank being in the same plane, can be struck at a single operation, so that the expense of manufacturing it is reduced to the minimum.

I provide a helical spring w for the purpose of counterbalancing the series of separator-blades, so that the operation of raising the same by the ring-rail will not be attended with too much resistance. One end of the spring is attached to the bracket or bearing c, and the other end to a collar w' which is rigidly attached by a set-screw w^2 to the separator-shaft a. The arrangement of the spring is such that it normally tends to raise the separators from the full-line position shown in Fig. 2 to the dotted-line position, the spring being, however, of not quite sufficient force

to overcome the weight of the blades, so that it does not prevent them from falling by gravity when the ring-rail descends.

I do not limit myself in all cases to the particular form and construction of the parts described, and may vary the same within the limits of mechanical skill and judgment, without departing from the spirit of the invention.

It will be seen that each separator-blade when in its normal position projects considerably below the level of its supporting shaft *a*, the lower portion of each blade constituting a downwardly projecting portion or guard. Said guards project so far below the shaft *a* and the fixed bearings in which it turns that the lower portion of each blade when in its operative position extends well down between the spindles, practically midway between the upper and lower ends of the wind on the bobbin, and remains between the upper portions of the spindles when the blades are raised by the ring-rail, as shown in dotted lines in Fig. 2. The blades are therefore not only at all times between the spindles but are also enabled by the described form to drop to their operative positions when the ring-rail is depressed more quickly than would be the case if the blades were not provided with the downwardly projecting portion extending below the shaft *a*. I am aware that in my Patent No. 504,954 above mentioned, blades are shown the lower portions of which extend downwardly below the rod to which they are attached; but said rod is not a shaft journaled in fixed bearings but is mounted in bearings in oscillating arms, so that the blades do not swing on an arc of a circle having a fixed center in close proximity to the spindles, but move in a long arc the center of which is located back of the roller-beam. In the present case, I combine the blades formed as described with a shaft journaled in fixed bearings on the roller-beam in close proximity to the spindles, so that when the blades are raised by the ring-rail, they swing in a short arc and therefore remain constantly between the spindles, excepting when they are thrown entirely back, as shown in Fig. 3.

I claim—

1. The combination with a shaft or rod and an arm or blade carried thereby, of a two-part clamp having a pair of jaws formed to grasp the shaft, another pair of jaws formed to grasp the arm or blade, co-operating inclined faces for closing one pair of jaws, and a connecting device for closing the other pair of jaws, said connecting device causing the co-operation of the inclined faces, as set forth.

2. A clamp composed of two members and having two pairs of jaws one pair of which is provided with tenons, said members having co-operating inclined faces for closing the tenoned jaws, and a connecting device whereby the other pair of jaws may be closed and the inclined faces caused to co-operate, as set forth.

3. The combination of a flat stamped metal blade having a flat shank in the same plane with the blade, a rod or shaft, and a clamp having two pairs of jaws, one formed to grasp the shank and the other the rod, the acting faces of one pair of jaws being arranged at right angles with those of the other pair.

4. The hinged thread-board having a pivoted depending dog, combined with the separator-shaft having an arm or projection, said dog being of a length to engage said arm or projection only when both the thread-board and separators are raised, substantially as described.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 30th day of July, A. D. 1894.

EDWARD WHITTUM.

Witnesses:
C. F. BROWN,
A. D. HARRISON.