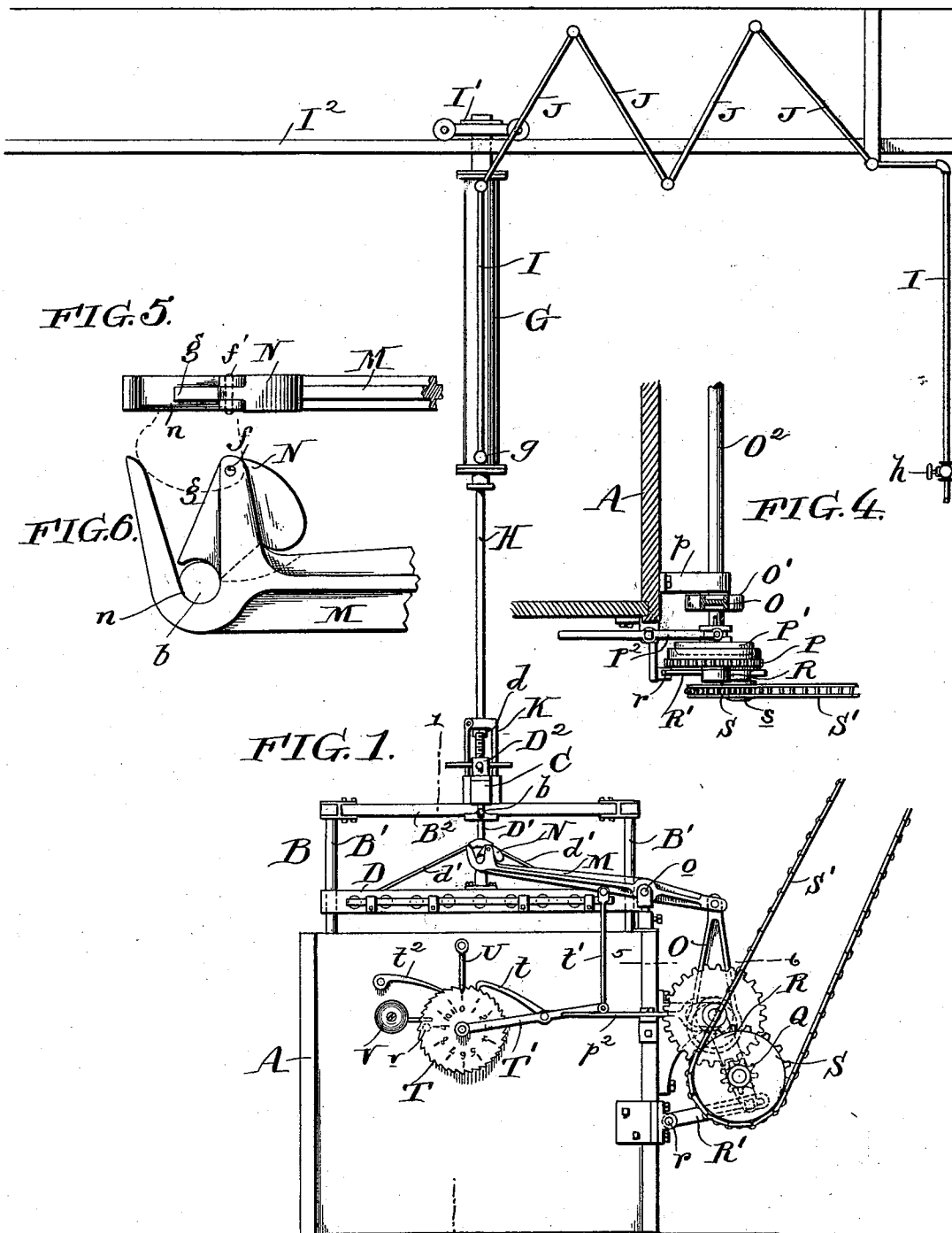


J. G. HASLAM.
APPARATUS FOR DYEING.

No. 505,984.

Patented Oct. 3, 1893.



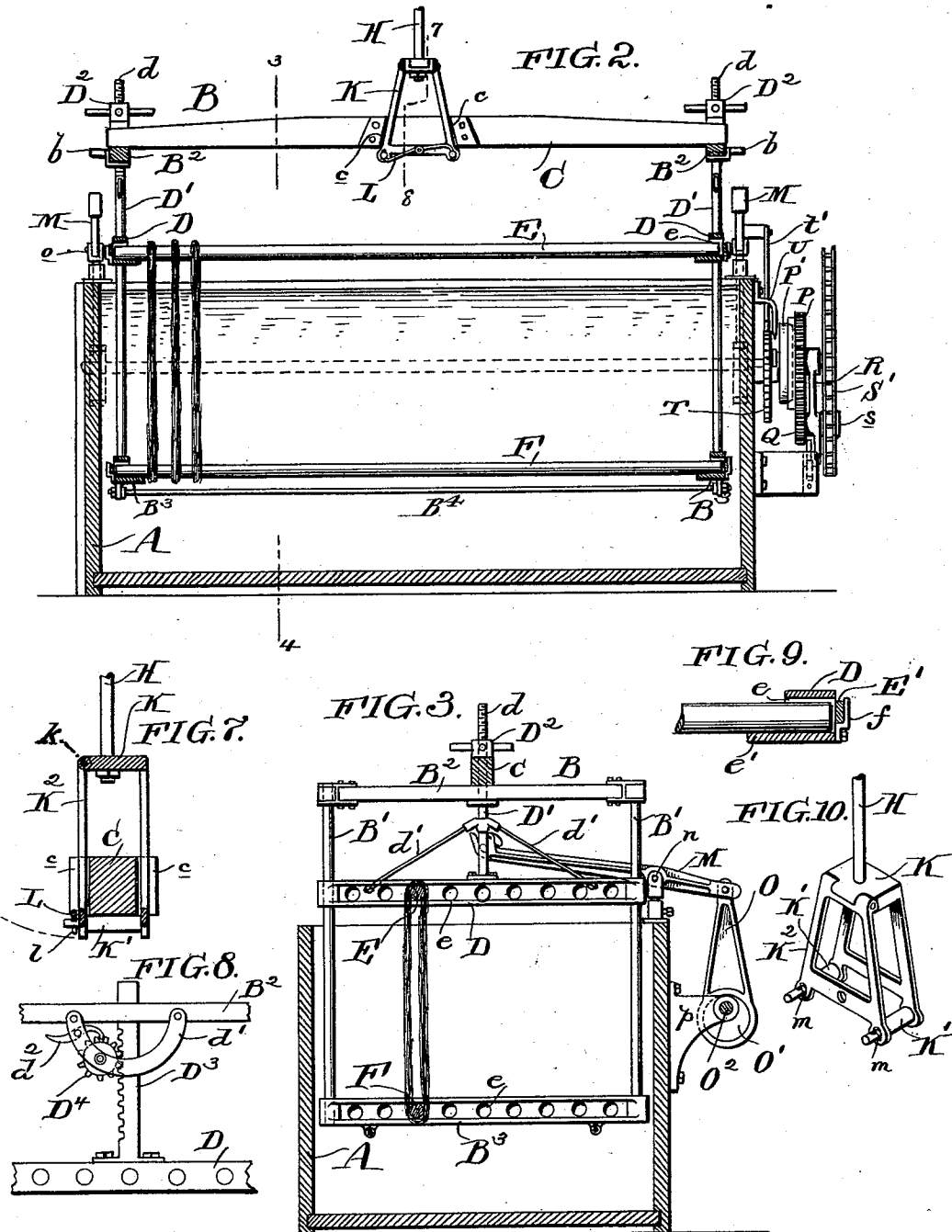
WITNESSES:
Henry Dwyer
C. M. Dittler

INVENTOR:
John G. Haslam
By his atty
[Signature]

J. G. HASLAM.
APPARATUS FOR DYEING.

No. 505,984.

Patented Oct. 3, 1893.



WITNESSES:
Henry D. Dwyer
C. M. Dietterich

INVENTOR:
John G. Haslam
By *Wm. H. Haslam*

UNITED STATES PATENT OFFICE.

JOHN G. HASLAM, OF PHILADELPHIA, PENNSYLVANIA.

APPARATUS FOR DYEING.

SPECIFICATION forming part of Letters Patent No. 505,984, dated October 3, 1893.

Application filed September 26, 1892. Serial No. 446,860. (No model.)

To all whom it may concern:

Be it known that I, JOHN G. HASLAM, of the city and county of Philadelphia and State of Pennsylvania, have invented an Improvement in Dyeing-Machines, of which the following is a specification.

My invention relates to yarn dyeing machines and consists of certain improvements, which are fully set forth in the following specification, and are shown in the accompanying drawings which form a part thereof.

More particularly my invention relates to dyeing machines of the character shown in Letters Patent No. 397,481, dated the 5th day of February, 1889, and granted to Thomas Wolstenholme, in which a yarn carrying frame is suspended in a dye vat by lifting devices (by which it may be raised from the vat or inserted therein), and is combined with mechanism for reciprocating it in the dye liquor for the purpose of subjecting the yarn to the proper action of the liquor. With the apparatus shown in that patent it is necessary to disconnect the yarn frame from the lifting devices, to permit it to be reciprocated in the liquor. In my improved apparatus this disconnection is unnecessary as the yarn frame is so supported by the lifting devices, that it may be reciprocated therein without disconnection.

My invention also includes improvements in the devices for reciprocating the yarn frame to move the yarn through the liquor, and embraces automatic locking devices upon the reciprocating arms or levers by which the yarn frame may be automatically locked in the arms or levers, when it is lowered into the vat.

Another improvement relates to the construction of the yarn frame, and to supports for the yarn sticks and embraces improved devices for adjusting the supports for the yarn sticks, to bring the sets of sticks nearer together or farther apart to suit the size of the skeins. In the Wolstenholme patent referred to the adjustment of the yarn sticks is accomplished by the movement of the supports for the lower set of sticks. The adjustment can consequently be made only when the yarn carrying frame is lifted from the liquor. By my improved construction, I accomplish the adjustment through the sup-

ports for the upper set of yarn sticks, so that it may be accomplished from the top of the yarn frame, and while the frame is lowered in the vat and the yarn submerged in the liquor.

Another feature of my invention consists of the employment of indicating devices, by which the number of reciprocations that have been imparted to the yarn frame is indicated, so that the attendant or operator is notified when the yarn has been sufficiently worked in the liquor.

My invention also relates to other improvements of construction and arrangements of parts which are hereinafter fully described and particularly set forth in the claims.

I shall now refer to the drawings for the purpose of describing the construction and mode of operation of my improved dyeing machine.

Figure 1 is an end elevation of my improved dyeing machine. Fig. 2 is a longitudinal vertical sectional view of the same on the line 1—2 of Fig. 1. Fig. 3 is a transverse vertical sectional view of the same on the line 3—4 of Fig. 2. Fig. 4 is a horizontal sectional view on the line 5—6 of Fig. 1. Fig. 5 is a plan view of the end of one of the levers which support and reciprocate the yarn carrying frame. Fig. 6 is a side elevation of the same. Fig. 7 is a vertical sectional view on the line 7—8 of Fig. 2, showing the support of the yarn carrying frame on an enlarged scale. Fig. 8 is a detail view illustrating a modification of the devices for adjusting the yarn sticks. Fig. 9 is a detail view of one of the supports of the yarn sticks, and Fig. 10 is a perspective view of the support of the yarn carrying frame.

A is the vat, which may be of any convenient shape and construction.

B is the yarn carrying frame preferably of a rectangular shape. This yarn carrying frame is preferably constructed of the uprights B' connected at the top and bottom by the end cross pieces B² B² and B³ B³. The lower cross pieces B³ B³, I prefer to use as the supports for the lower set of yarn sticks.

B⁴ B⁴ are longitudinal rods connecting the lower cross pieces B³, B³.

D, D are the supports for the upper set of yarn sticks carried upon the end uprights B' B', and for purposes of adjustment, I prefer

to make these supports D movable upon the uprights B', B'. For this purpose I prefer to employ the rods D', D', carried by the end pieces B' B' and extending up through the longitudinal piece C, with adjusting nuts D² upon the ends of the rods D' D', provided with internal screw threads, engaging the threaded ends *d* of the rods D'. By this means it is apparent that the supports D, D, may be raised or lowered upon the uprights B' B', and may thus be adjusted with reference to the lower supports B², B², to suit the length of the skeins of yarn to be treated. The supports D, D, may be connected with the rods D' D' by braces *d'* *d'* for the purpose of more firmly supporting them.

E are the upper yarn sticks carried by the supports D, D, and F are the lower yarn sticks carried by the supports B² B². It will be seen that the adjustment of the yarn sticks is accomplished from the top of the yarn frame by moving the upper supports D, D, so that the adjustment may be accomplished without lifting the frame from the vat; and through the upwardly extending rods carried by the supports D, D, the adjustment may be made even when the frame is submerged in the vat.

For the purpose of permitting the yarn sticks to be easily inserted in their respective supports, and to be readily removed therefrom, I prefer to form each support with a series of sockets *e*, open at their ends to permit a longitudinal movement of the end of the yarn stick in the socket so that they may be easily inserted and removed.

E' is a longitudinal locking bar carried by the supports D, D, and B² B², extending over and closing the open ends of the sockets *e*, and supported by supports *f*. To insert or remove the yarn sticks, the locking bar E' is withdrawn when the sticks may be moved longitudinally to free the ends from the sockets *e*, or to insert them therein. The locking bar E' when in place, locks the ends of the yarn sticks in their sockets. To prevent the skeins adjacent to the ends of the sticks becoming entangled in the sockets *e*, the sockets may be provided with a projecting guard *e'*.

For raising or lowering the yarn carrying frame to immerse it in the dye liquor and to lift it therefrom, I employ a cylinder G provided with a piston, which may be operated by gas, air, steam, or water, and is provided with a piston rod H, connected with the yarn carrying frame B. The cylinder G is connected as at *g* with the pipe I, J, through which the gas, air, or steam or water may be fed to the cylinder or discharged from it to raise and lower the piston in the well known manner. The supply and discharge of the water are controlled by the valve *h*. The cylinder G may be suspended or suitably supported from the wall or ceiling but to permit the yarn carrying frame B to be moved away from the vat A, when it has been lifted from it, I prefer to connect the cylinder G with a movable trolley or carriage I', running on a

guide or track I², and to make a portion of the pipe I, as J, flexible or jointed, so as to permit the movement of the cylinder. By this means the frame B may be easily moved away from the vat A. It is apparent that, instead of being carried by the movable carriage I', the cylinder G might be suspended from a swinging arm or crane.

The frame B may reciprocate independently of the movement of the rod H for the purpose of working the yarn in the liquor. For this purpose I employ an open supporting frame K, carried by the rod H, through which the longitudinal bar C of the frame B extends with freedom of vertical movement therein.

The bar C is supported upon the lower portion K' of the frame K. To permit the bar C to be connected with the frame K, or disconnected therefrom, one side K² of the frame K may be hinged as at *k*, so that it may be opened out. The hinged portion K² may be locked, when closed, in any convenient manner. For this purpose I have shown a locking dog L pivoted to the hinged portion K² and provided upon its two ends with pins *l*, which engage recesses *m* in the ends of the lower portion K' of the frame; the hinged portion K² being provided with eyes through which the ends of portion K' project.

The sides of the frame K constitute guides in which the bar C may move.

The bar C may be provided with guides located immediately adjacent to the sides of the frame K, to guide the bar C when it is reciprocated within the guides of the frame K.

The frame B is reciprocated by rocking levers M, having notches *n* which receive trunnions *b* on the ends of the frame B. To automatically lock the trunnions *b* in the notches *n* of the levers M, I employ a weighted dog N pivoted, as at *f'*, to the notched end of each lever M. The weight of the dog N is so disposed that it normally throws the portion *g* between the jaws which form the notch *n*, so that the part *g* locks the trunnion in the notch. When the trunnion *b* passes between the jaws of the notch, it strikes the portion *g* of the dog N and pushes it aside against the action of its weight; but when the trunnion *b*, becomes seated in the notch *n*, it has passed below the part *g* of the dog and the action of gravity causes the dog to swing back so that the part *g* extends over the trunnion and locks it in its bearing. By this means the trunnions *b* of the frame are automatically locked in the notches of the vibrating levers M. I prefer to form the bases of the portions *g* of the dogs N notched or concave as shown, so that any rising of the trunnions *b* in the notches *n* and consequent friction against the bases of the parts *g* will not tend to throw the dogs N open and thus permit the trunnions to slip out of the notches *n*, but it will rather tend to throw the portions *g* farther toward the outer one of the jaws which form the notches *n*, and

thus keep the dogs in locking position. To release the trunnions *b* the dog *N* may be thrown over in the direction of the arrow in Fig. 6, into the position shown in dotted lines, when the trunnions may pass freely from the notches *n*, when the frame *B* is lifted, and so doing will strike the weighted portions of the dogs and throw the dogs back into their normal positions shown in full lines. The levers *M* are pivoted as at *o*, to the vat *A* at each end, and their outer ends are connected with the eccentric rods *O* operated by eccentrics *O'* and the shaft *O²*, which is journaled in suitable brackets *p* on the vat *A*. The shaft *O²* is driven from the gear wheel *P*, through the friction clutch *P'* feathered on the shaft *O²* and operated by the shifting lever *P²*.

Q is a pinion carried on a stud on a lever *R* sleeved on the shaft *O²*, and engaging the teeth of the gear wheel *P*. The outer end of the lever *R* may be adjustably connected as by a bolt and slot, with a lever *R'* pivoted as at *r*, to the vat *A*.

S is a sprocket wheel fastened on the stud *s* which carries the pinion *Q* and is driven by the chain *S'* from any convenient source of power. The sprocket wheel *S*, being driven by the chain *S'* rotates the stud and pinion *Q*, and by the pinion *Q* the gear wheel *P* is rotated, whence power is imparted to the shaft *O²* through the friction clutch *P'*. By this construction the sprocket wheel *S* may be adjusted to put the proper tension upon the chain *S'*; since the wheel *S* and pinion *Q* are carried by the lever *R*, which may be adjusted through the bolt and slot connection with the lever *R'*.

The levers *M*, *M*, may be vibrated in any other convenient manner. By the vibration of the levers *M*, *M*, the frame *B* is moved up and down in the liquor, to subject the yarn to the action thereof, by moving it up and down in the liquor, and by suspending the skeins more or less loosely upon the yarn sticks, as described in the patent of Wolstenholme, No. 397,481, dated February 5, 1889, the skeins will move away from contact with the sticks during the reciprocation, thus permitting the liquor to penetrate all portions of the yarn equally, and rendering unnecessary the turning of the yarn sticks, as is now generally practiced for the purpose of shifting the yarn. In the machine herein described it is a simple matter to properly support the skeins so as to permit this movement, by reason of the great ease with which the yarn sticks may be adjusted through the adjusting nuts *D²*.

A modified form of these devices for adjusting the yarn sticks is shown in Fig. 8. In this construction in place of the rods *D'*, racks *D³* are employed, operated by a pinion *D⁴* carried in a bracket *d'* of the end frame pieces *B²* and locked by a dog *d²*. By releasing the dog *d²*, the pinion *D⁴* may be turned to raise or lower the frames *D*.

To indicate the number of reciprocations

of the frame *B* in the liquor and show when the yarn has been subjected sufficiently to the action of the dye liquor, I employ a rotary, ratchet disk *T* operated by a pawl *t*, through a lever *T'*, and link *t'*, from one of the levers *M*. The pawl *t* is carried by the pivoted lever *T'* which is in turn connected with the lever *M* through the link *t'*, so that upon each vibration of the arm *M* the pawl will turn the disk *T*, the extent of one ratchet tooth. A pawl *t²* is employed to prevent backward rotation of the disk *T*. The disk *T* may be provided with a dial face and a stationary finger or index *U* may be arranged adjacent to it, so as to indicate by the figure upon the dial under the finger or index *U* the number of reciprocations that have been imparted to the yarn carrying frame. This indicating device may be further provided with an alarm *V*, operated by a pin or projection *v* upon the disk *T*, so that when the disk has been turned a given distance, corresponding with the desired number of reciprocations of the frame *B*, the pin or projection *v* will strike the alarm and operate it, indicating to the operator that the yarn has been sufficiently treated, when by shifting the friction clutch *P'*, the further vibration of the arms *M*, *M*, may be stopped, and the frame may be lifted from the vat by the lift *G*, and may be removed and replaced by another frame with fresh yarn.

While I prefer the minor details of construction that have been shown I do not limit myself to them, as it is apparent that they may be varied without departing from the invention.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a dyeing machine the combination of a dye vat, a lift, a yarn frame supported by the lift with freedom of vertical movement with reference thereto, and devices to reciprocate the yarn frame upon the point at which it is supported by the lift, and independently thereof, whereby the yarn frame may be raised from the vat or carried therein by the lift and may be reciprocated in the vat independently of the lift and without disconnection therefrom.

2. In a dyeing machine the combination of a yarn frame, a support therefor having guides in which the yarn frame may move and a movable portion or member which may be opened or removed to admit the yarn frame, and devices to reciprocate the yarn frame in the guides of the support.

3. In a dyeing machine the combination with the dye vat, and yarn carrying frame, of the supporting frame *K*, in which the yarn frame is supported with freedom of movement, having the hinged member or portion *K²*, a lock to lock the hinged member *K²* to the frame *K*, and devices to reciprocate the yarn carrying frame in the supporting frame *K*.

4. In a dyeing machine a yarn frame having a set of upper and of lower yarn sticks,

and provided with stationary supports for the set of lower yarn sticks and adjustable supports for the set of upper yarn sticks.

5 A yarn carrying frame for a dyeing machine having a set of upper and lower yarn sticks, supports for the set of lower yarn sticks, adjustable supports for the upper yarn sticks carrying upwardly extending rods or projections, and means to lower and raise said
10 extending rods or projections to adjust the supports of the upper yarn sticks with reference to the supports of the lower yarn sticks.

6. In a dyeing machine a yarn carrying frame consisting of the uprights B', the lower
15 transverse end pieces B² B³, the upper transverse end pieces B² B³, the longitudinal top piece C, and the supports for the upper set of yarn sticks guided by the uprights B', B' and adjustable thereon.

20 7. In a dyeing machine a yarn carrying frame consisting of the uprights B', the lower transverse end pieces B² B³, the upper transverse end pieces B² B³, the longitudinal top piece C, and the supports for the upper set
25 of yarn sticks guided by the uprights B' and provided with upright rods or extensions projecting through the upper transverse end pieces B² B³, and means to raise and lower
30 the upright rods or extensions of the supports for the upper set of yarn sticks for the purpose of adjusting said supports.

8. In a dyeing machine, the combination with the yarn sticks of supports for the ends thereof, having sockets to receive the ends
35 of the sticks and a projecting lip or extension e' adjacent to said sockets.

9. In a yarn dyeing machine, rocking arms or levers for reciprocating a yarn frame, hav-

ing notched ends, and a weighted lock pivoted at one side of the notched ends and normally projecting over the notches in the ends
40 of the arms or levers.

10. In a yarn dyeing machine, the rocking arms or levers M, having the notched ends n, combined with the pivoted weighted dogs N,
45 pivoted at one side of the notched ends and having the portions g normally projecting over the notches n.

11. In a yarn dyeing machine, the combination with the yarn carrying frame of arms
50 or levers supporting said frame, a shaft, connections between the shaft and arms or levers for reciprocating them, a gear wheel for rotating the shaft, a pinion engaging said gear wheel, a driving wheel, and an adjustable
55 stud carrying the pinion and driving wheel, whereby the driving wheel may be moved to regulate the tension of the driving band or chain without breaking the engagement of the pinion and gear wheel.

12. In a dyeing machine, a yarn frame having a set of upper and lower yarn sticks, and provided with supports for the lower set of yarn sticks, and independently adjustable supports for the upper set of yarn sticks,
55 whereby the upper set of sticks may be adjusted independently with reference to the lower set of yarn sticks from the top of the frame.

In testimony of which invention I have here-
70 unto set my hand.

JOHN G. HASLAM.

Witnesses:

ERNEST HOWARD HUNTER,
HELEN L. MOTHERWELL.