

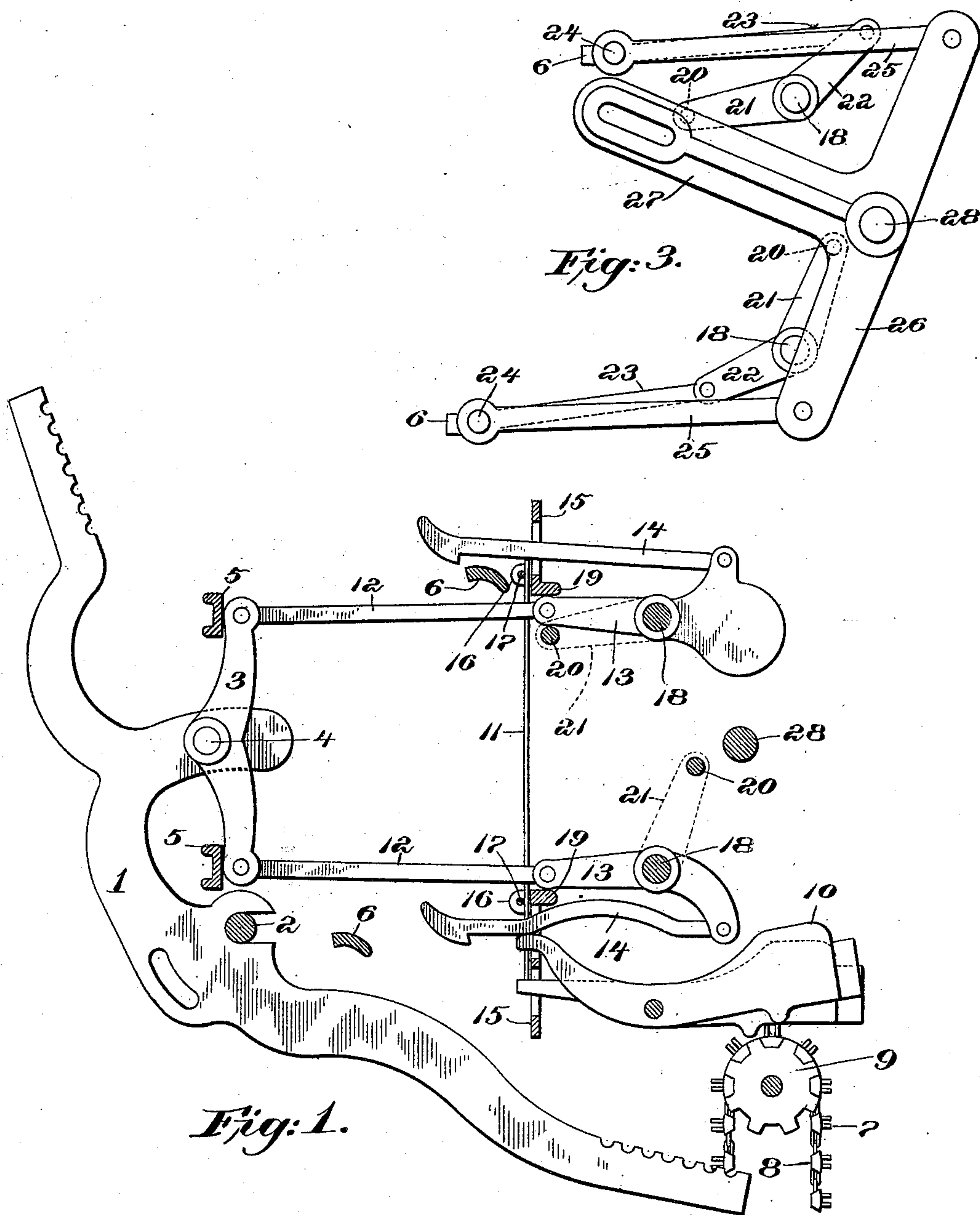
(No Model.)

2 Sheets—Sheet 1.

J. M. MARCO.  
SHEDDING MECHANISM FOR LOOMS.

No. 561,266.

Patented June 2, 1896.



Witnesses:

Arthur F. Randall.  
Robert Wallace.

Inventor:

John M. Marco  
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His Attorneys

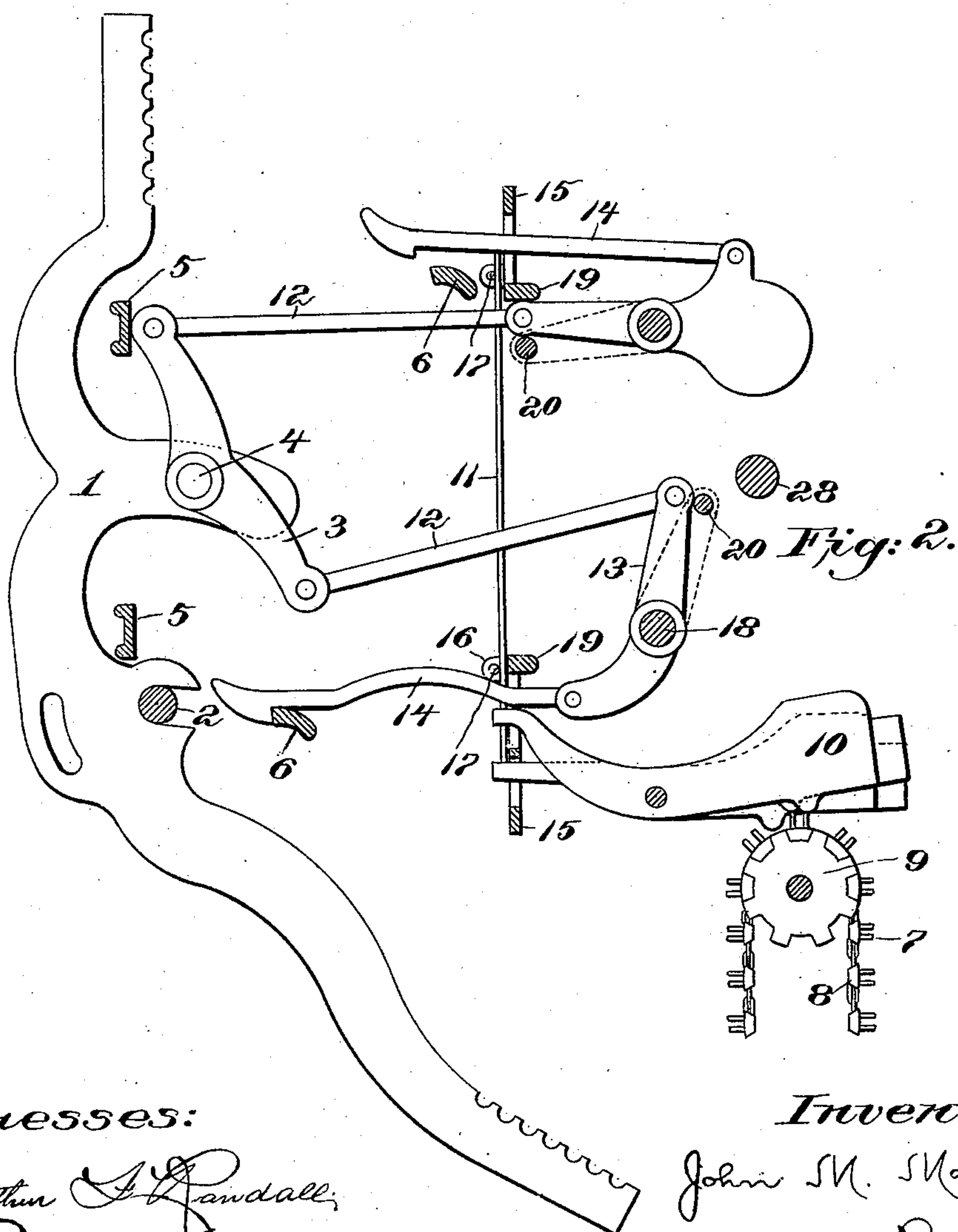
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# UNITED STATES PATENT OFFICE.

JOHN M. MARCO, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO THE  
KNOWLES LOOM WORKS, OF WORCESTER, MASSACHUSETTS.

## SHEDDING MECHANISM FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 561,266, dated June 2, 1896.

Application filed October 25, 1895. Serial No. 566,823. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN M. MARCO, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Shedding Mechanism for Looms, of which the following is a specification, reference being had therein to the accompanying drawings.

10 The invention relates to shedding mechanism of the dobby type, and more particularly to what are known as "positive dobbies"—namely, those which act to move the harness-frames positively in both directions without  
15 the aid of springs or the like.

The invention consists in certain novel features of construction and new and useful combinations of parts, as first will be described with reference to the accompanying drawings,  
20 and afterward will be pointed out more particularly and distinctly defined in the claims at the close of this specification.

Figure 1 of the drawings is a view, chiefly in side elevation, of the essential elements of  
25 a dobby embodying my present invention, certain parts being in transverse section. Fig. 2 is a similar view of the same parts, showing them, however, in different positions. Fig. 3 is a view showing certain features of the actuating mechanism.

30 The drawings show in Figs. 1 and 2 only one harness-lever and the parts which are intermediate the pattern-chain and the said harness-lever; but it will be understood that  
35 any suitable number of harness-levers may be employed in practice and that the said intermediate parts will be duplicated correspondingly.

40 Fig. 3 shows only the actuating connections pertaining to one side of the dobby; but it will be understood that such connections will be suitably duplicated at the other side thereof, as usual.

At 1 is a harness-lever, the same being pivotally mounted upon a rod 2, as usual, the  
45 said rod serving for the support of the entire series of harness-levers and being mounted in suitable manner (not necessary to be shown) on the main framework of the dobby. (Not  
50 shown.)

3 is the usual lever-like connection for the

harness-lever 1, the same being mounted at 4 upon the upper part of the said harness-lever, as customary.

5 5 are cross-bars or rests supported in customary manner by the framework of the dobby, against which the ends of the series of connections 3 bear, the said ends rocking on  
60 the surfaces of the said cross-bars in the movements of the parts, as usual, and as clearly will be understood from Fig. 2 of the drawings.

Heretofore hooked jacks or hooks have been pivotally connected with the upper and lower  
65 ends of the connections 3, the same being controlled in their engagement with the usual lifters by means of pattern devices of well-known character. In the drawings I show  
70 lifters at 6 6, and also show a familiar form of pattern devices comprising indicators 7 on a pattern-chain 8, passing around a chain-barrel 9, the said indicators acting to move  
75 finger-levers 10 10. In some prior constructions of dobbies one hooked jack rests directly upon the inner upturned end of one of the finger-levers 10, while the other rests  
80 upon the upper end of an upright wire or needle, which latter in turn is supported by the inner end of an adjacent finger-lever 10. In my improved dobby the hooked jacks or hooks  
85 which I employ are operated by similar pattern devices, but are not connected directly to the connection 3. Instead I employ the following combination and arrangements of parts.

12 12 are connecting-rods, one of which is  
90 joined pivotally with the upper end of the connection 3 and the other with the lower end of the connection 3. These connecting-rods 12 12 are also joined, respectively, to the inwardly-directed arms of bent levers 13 13. To the outer arms of the said levers 13 13 are pivoted the hooks or hooked jacks 14, the  
95 latter passing through the spaces of the grids or gratings 15 15, the lower of which grids or gratings also serves for the guidance of the inner ends of the finger-levers 10 10. The  
100 said grids or gratings are formed with lugs 16 16, which support the horizontal or cross wires 17 17, by means of which the upright wires or needles 11 are held in place. The  
lifters 6 6 cooperate with the two series of



hooks or hooked jacks 14 14 precisely as in the ordinary dobby, save that instead of operating to draw the hooks or hooked jacks outwardly, as is customary, the said lifters, 5 when they are permitted to engage with the hooks or hooked jacks 14 14, draw the latter inwardly—that is, toward the left in the drawings. The movement thus given to the hooks or hooked jacks 14 14 operates to turn the 10 bent levers 13 13 about the supporting rock-shafts 18 18 on which the two series of bent levers 13 13 are mounted.

Fig. 1 shows the bent levers, &c., in their normal position with both ends of the connection 3 in contact with the adjacent cross-bars or rests 5 5. 15

Fig. 2 shows the lower hook or hooked jack 14 engaged by the lower lifter 6 and drawn inwardly thereby, with the lower bent lever 20 13 turned about its supporting rock-shaft 18, so that the arm thereof which is joined to the connecting-rod 12 is carried into an upright position, thereby drawing outwardly the lower end of the connection 3 and rocking the said 25 connection upon the support or backing that is afforded to its upper end by the upper cross-bar or rest 5, thus drawing the harness-lever 1 into its outer position, as shown, which is the movement of the harness-lever by which 30 the connected harness-frame is raised.

The bent levers 13 serve, as will be apparent from the foregoing, to transmit movement from the hooks or hooked jacks 14 14 through the connecting-rods 12 12 and connection 3 to the harness-lever 1 and to convert the inward movement of the lifters and of the hooked jacks or hooks which at any given time are allowed to become engaged with the said lifters into an outward movement of the harness-levers. 35

19 19 are cross-bars or rests, which preferably are integral with or form parts of the grids or gratings 15 15. These cross-bars or rests 19 19 are located adjacent to the free 45 extremities of the inner or straight arms of the bent levers 13 13 when the said ends are in their normal position, as in Fig. 1; but each of them is somewhat to one side of a straight line joining the center of the adjacent rock-shaft 18 with the center of the pivot, which connects the adjacent connecting-rod 12 with the corresponding end of the connection 3. In other words, the upper rest 19 is slightly above a straight line joining the center of the 55 upper rock-shaft 18 with the center of the pivot which connects the upper connecting-rod 12 with the connection 3, while the lower rest 19 is slightly below a straight line joining the center of the lower rock-shaft 18 with the pivot at the lower end of the connection 3. The said free extremities of the straight or inner arms of the bent levers 13 are intended to rest normally against the said rests 19 19. When thus resting against the said 65 rests 19 19, the pivot which joins or connects each connecting-rod 12 with the correspond-

ing lever 13 is somewhat to one side of the straight line aforesaid, so that pressure which is transmitted outwardly through the rod 12 tends to flex the joint in a direction which 70 operates to maintain the inner arm of the lever 13 in contact with the rest 19.

For the purpose of returning the levers 13 13 positively from the position in which the lower lever 13 is represented in Fig. 2 to the normal 75 position represented in Fig. 1, and thereby providing for positively occasioning the inward movement of the harness-lever which produces the depression of the raised harness-frame, I provide cross-rods 20 20, one cooperating with the upper set of levers 13 and the other with the lower set of levers 13. These 80 cross-rods 20 20 are mounted, respectively, in arms 21 21, which are affixed to the rock-shafts 18 18, and the latter are rocked or oscillated 85 in a manner which carries each rod from the position of the upper cross-rod 20 in Figs. 1 and 2 to the position of the lower cross-rod in said figures, and vice versa.

The movements of the respective cross-rods 90 20 20 are timed so that each cross-rod 20 moves in unison with the adjacent lifter 6, but in the opposite direction, in order that the said cross-rod 20 may recede from the position shown at the top in Figs. 1 and 2 to the 95 position shown at the lower part of said figures, and thus not interfere with or prevent the movement of the bent levers 13 in consequence of the engagement of the hooked jacks or hooks 14 by the lifters 6 6. In other words, 100 as each lifter moves inwardly the adjacent cross-rod 20 moves outwardly, and vice versa. By the inward movement of the said cross-rods 20 20 such of the bent levers 13 13 as have been moved by reason of the preceding 105 movement of the lifters are restored to normal position in contact with the rests 19 19, as indicated at the top in Figs. 1 and 2. They are maintained in such positions with the inner extremities of the straight or inner arms 110 of the bent levers 13 13 in contact with the rests 19 19 by the gravitating tendency of the overweighted outer ends of the upper levers 13 and of the inner arms of the lower levers 13, as well as of the connecting-rods 12, which 115 are joined with the said lower levers.

22, Fig. 3, is an arm that is affixed to one end of each rock-shaft 18. Each of the said arms is joined by a connecting-rod 23 to the 120 pivot 24, which projects from the adjacent one of the lifters 6. Said pivot also has applied thereto, as usual, the connecting-rod 25, the latter serving to connect the said lifter with the corresponding end of the usual actuating T-lever 26. The said lever 26 has the 125 operating-arm 27, to which power is transmitted in usual manner for the actuation of the T-lever and of the rock-shaft 28, on which it is mounted. In practice each rock-shaft 28 18 18 has similar arms and connections at its 130 opposite end. (Not shown.)

I claim as my invention—



1. The combination with a harness-lever, and a connection, as 3, pivotally connected therewith, of connecting-rods which are joined to the opposite ends of the said connection, 5 levers with which the other ends of the said connecting-rods are pivotally connected, hooked jacks or hooks connected with the said levers, lifters, and pattern devices for indicating the engagement of the said hooked 10 jacks or hooks with the said lifters, substantially as described.

2. The combination with a harness-lever, and a connection, as 3, pivotally connected therewith, of connecting-rods which are joined 15 to the opposite ends of the said connection, levers with which the other ends of the said connecting-rods are pivotally connected, hooked jacks or hooks connected with the said levers, lifters, pattern devices for indicating the engagement of the said hooked 20 jacks or hooks with the said lifters, and means to restore the respective ends of the connection and the parts which are connected therewith to their normal position after the outward movement of such ends, substantially 25 as described.

3. The combination with a harness-lever, and a connection, as 3, pivotally connected therewith, of connecting-rods which are joined 30 to the opposite ends of the said connection, levers with which the said connecting-rods are also connected, hooked jacks or hooks operatively connected with the said levers, lifters, pattern devices for indicating the engagement of the said hooked jacks or hooks with 35 the said lifters, and devices engaging with the said levers and acting to restore them to their normal position after the outward movements of the respective ends of the connection, substantially as described. 40

4. The combination with a harness-lever, and a connection as 3, pivotally connected therewith, of connecting-rods which are joined 45 to the opposite ends of the said connection, levers with which the said connecting-rods are also connected, hooked jacks or hooks operatively connected with the said levers, lifters, pattern devices for indicating the engagement of the said hooked jacks or hooks with 50 the said lifters, means to restore the respective ends of the connection and the parts which are connected therewith to their normal position after the outward movement of such ends, and the rests against which the 55 joints between the connecting-rods and the

levers bear with the said joints flexed outward slightly, substantially as described.

5. The combination with a harness-lever, and a connection, as 3, pivotally connected therewith, of connecting-rods which are joined 60 to the opposite ends of the said connection, levers with which the said connecting-rods are also connected, hooked jacks or hooks connected with the said levers, lifters, pattern devices for indicating the engagement of 65 the said hooked jacks or hooks with the said lifters, devices engaging with the said levers and acting to restore them to their normal position after the outward movements of the respective ends of the connection, and the rests 70 against which the joints between the connecting-rods and the levers bear with the said joints flexed outward slightly, substantially as described.

6. The combination with a harness-lever, 75 and a connection, as 3, pivotally connected therewith, of connecting-rods which are joined to the opposite ends of the said connection, levers with which the said connecting-rods are also connected, hooked jacks or hooks 80 connected with the said levers, lifters, pattern devices for indicating the engagement of the said hooked jacks or hooks with the said lifters, the cross-rods 20 acting to return the said levers to their normal position, and de- 85 vices to operate the said lifters and cross-rods 20, substantially as described.

7. The combination with a harness-lever, and a connection, as 3, pivotally connected therewith, of connecting-rods which are joined 90 to the opposite ends of the said connection 3, levers with which the other ends of the said connecting-rods are also connected, hooked jacks or hooks connected with the said levers, lifters, pattern devices for indicating the en- 95 gagement of the said hooked jacks or hooks with the said lifters, the cross-rods 20 acting to return the said levers to their normal position, devices to operate the said lifters and cross-rods 20, and the rests 19, 19 against 100 which the joints between the connecting-rods and the levers bear with the joints flexed outwardly slightly, substantially as described.

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

JOHN M. MARCO.

Witnesses:

ELI NAUSOHOF,

RUSSELL T. BOSWELL.