

No. 683,398.

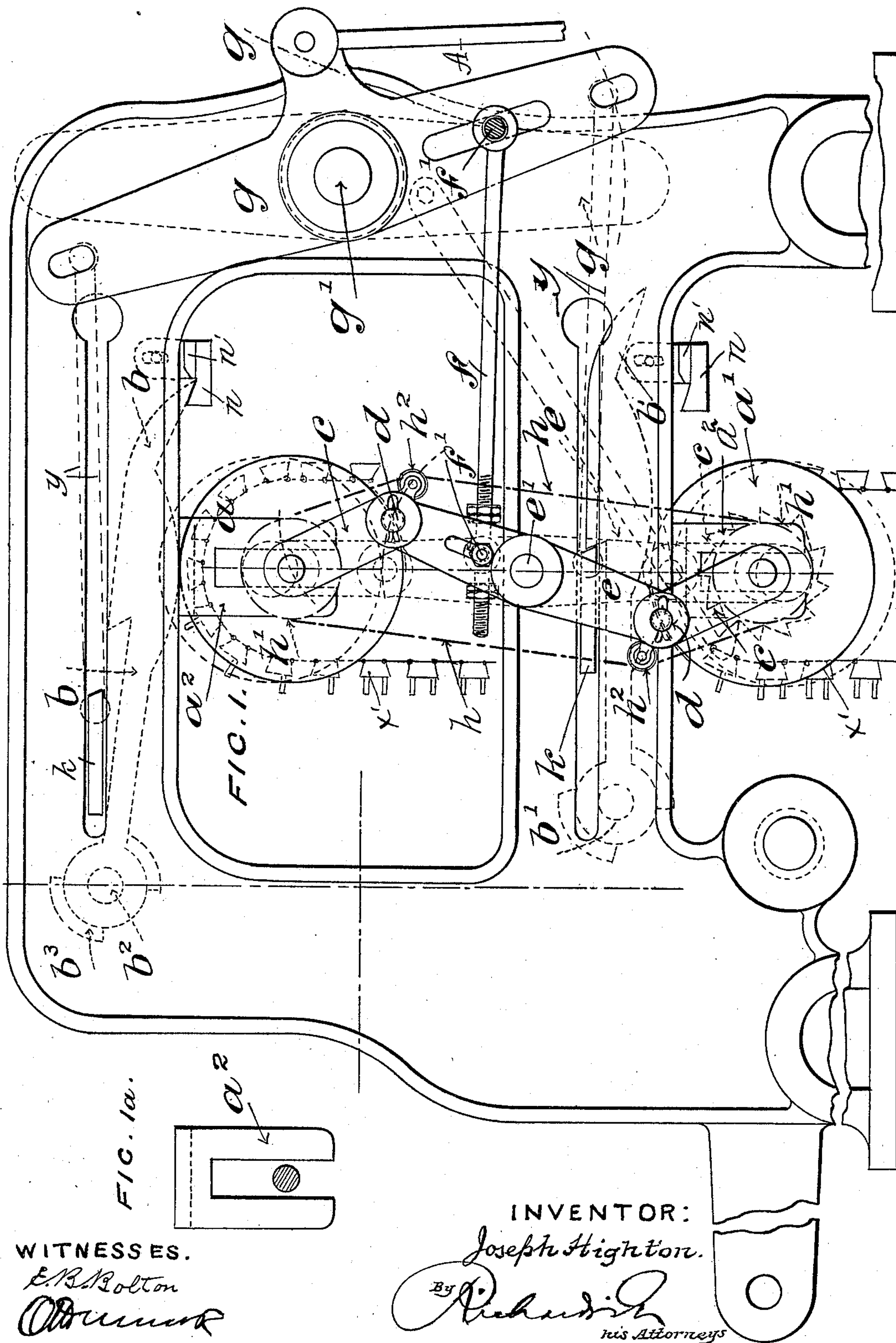
Patented Sept. 24, 1901.

J. HIGHTON.  
LOOM DOBBY.

(Application filed Mar. 5, 1901.)

(No Model.)

3 Sheets—Sheet 1.



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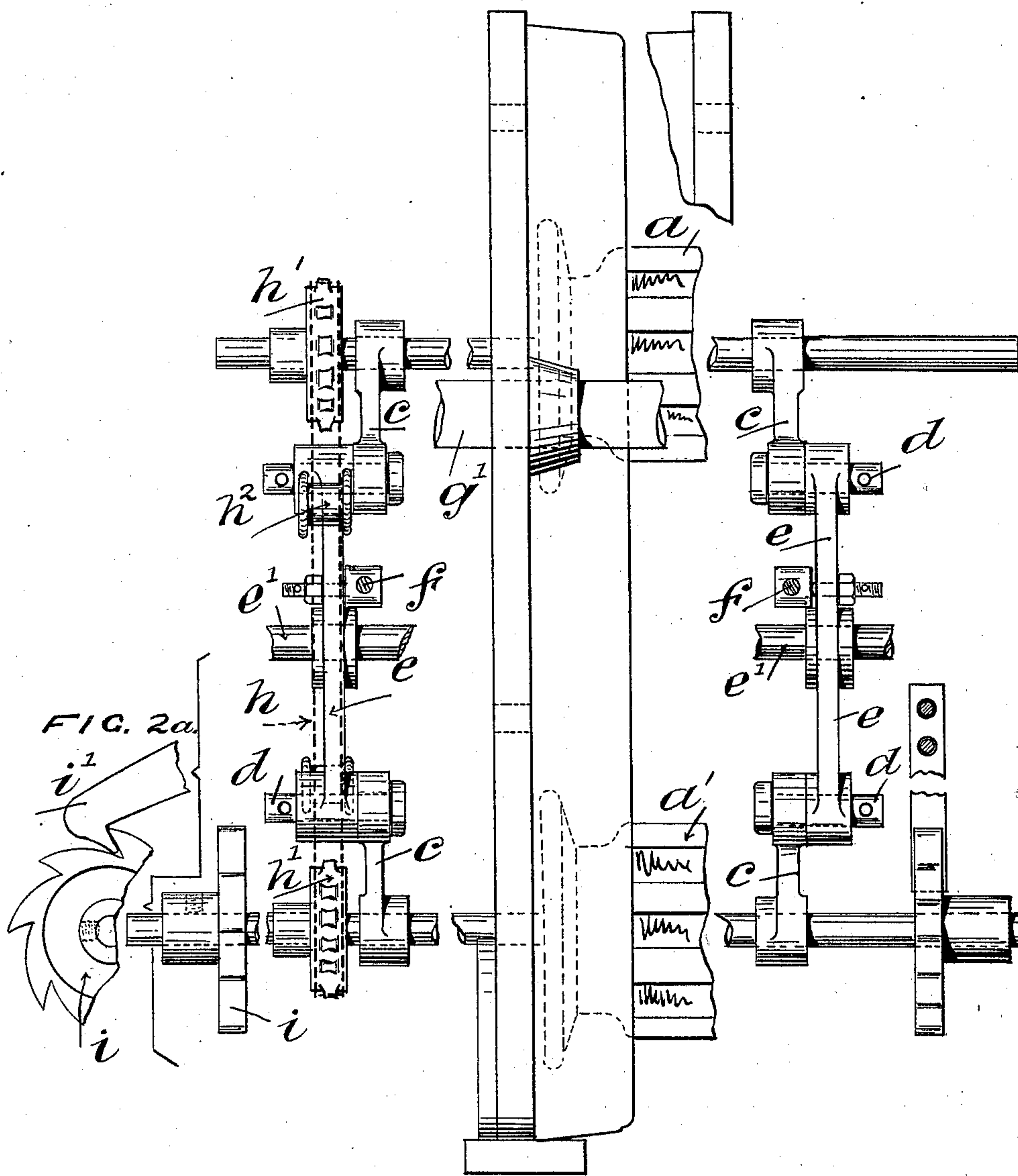
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3 Sheets—Sheet 2.

FIG. 2.



WITNESSES.

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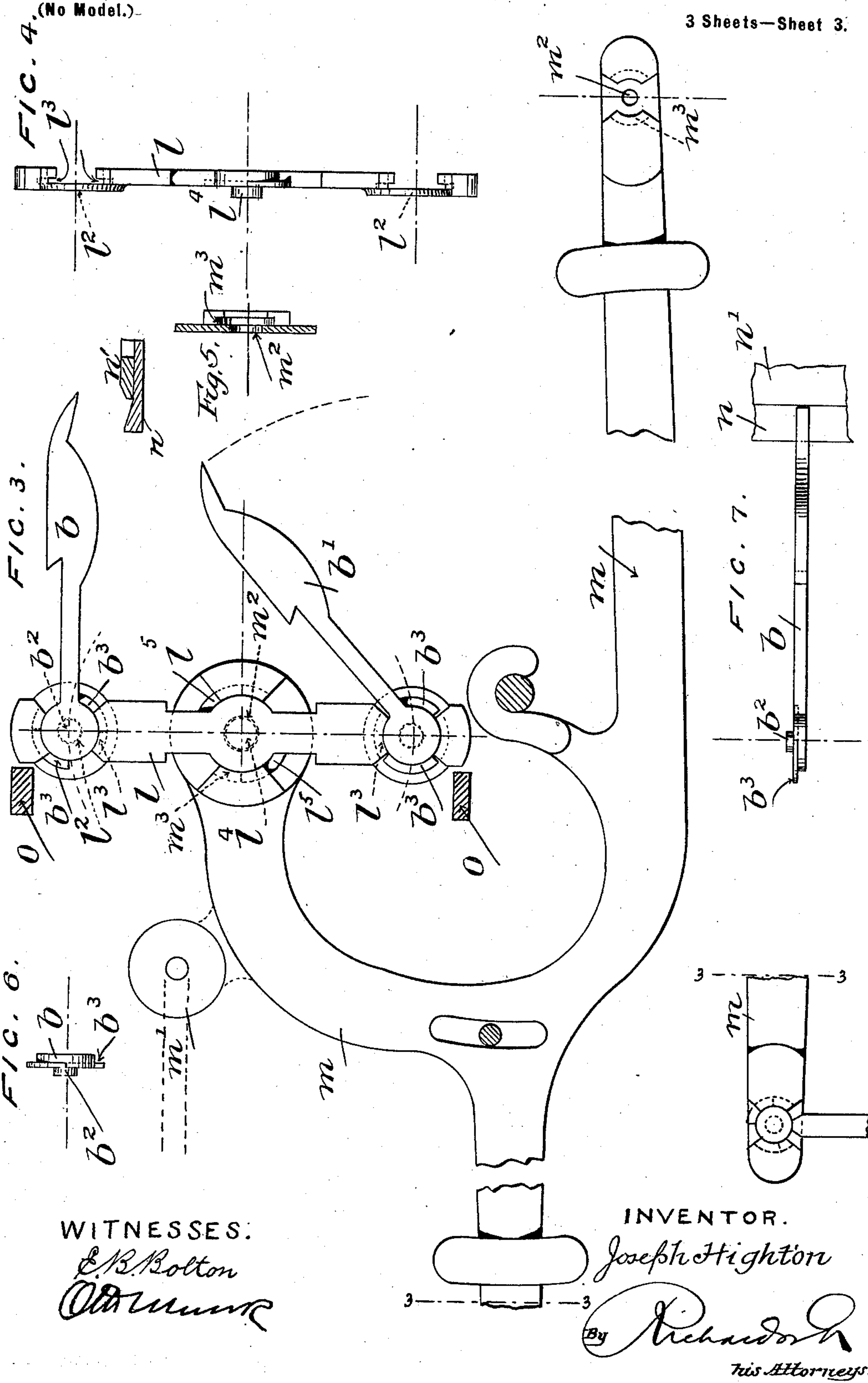
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3 Sheets—Sheet 3.

(No Model.)





# UNITED STATES PATENT OFFICE.

JOSEPH HIGHTON, OF MANCHESTER, ENGLAND.

## LOOM-DOBBY.

SPECIFICATION forming part of Letters Patent No. 683,398, dated September 24, 1901.

Application filed March 5, 1901. Serial No. 49,850. (No model.)

*To all whom it may concern:*

Be it known that I, JOSEPH HIGHTON, weaving overlooker, a subject of the King of Great Britain and Ireland, and a resident of 111 Gill street, Blackley, Manchester, in the county of Lancaster, England, have invented certain new and useful Improvements in and Relating to Loom-Dobbies, (for which I have made application in Great Britain, No. 13,011, dated July 19, 1900,) of which the following is a specification.

My said invention has reference to improvements in dobbies employed in looms for weaving for the purpose of lifting the healds for shedding the warps, as is well understood.

The invention relates to an improved method of positively or directly actuating the hooks from the barrels, pattern-chains, or the like, so as to dispense with the use of feelers or needles for raising such hooks.

The invention also relates to an improved form of bearing or connection for connecting or securing together the hooks and balks, such improved form of bearing or connection being applicable for securing together the balks and "jacks," and it might be the jacks and healds.

My said invention will be clearly understood from the following detailed description, throughout which reference will be made to the annexed three sheets of drawings.

In the said drawings, on Sheet 1, Figure 1 shows in side elevation my improved means for positively or directly actuating the hooks, so much of a dobby-framing and working parts being indicated as is necessary for a clear understanding of my invention. Fig. 1<sup>a</sup> is a separate view of one of the brackets which guide the barrels as they rise and fall. On Sheet 2, Fig. 2 is an end elevation of Fig. 1 with certain of the parts broken away or omitted for the sake of clearness. Fig. 2<sup>a</sup> shows a side view of the ordinary notched wheel and pawl used for rotating the barrel or cylinder. On Sheet 3, Fig. 3 shows a side elevation of my improved connecting-balk, with attached hooks connected to the balk in accordance with my improvements. The figure also shows a jack-lever in connection with a balk. Fig. 4 is an edge view of the balk. Fig. 5 is a vertical section of the bearing formed in the upper arm of the jack-le-

ver to receive the balk. Fig. 6 is an end view of one of the hooks. Fig. 7 shows one of the hooks in plan view.

Under the first part of my invention I employ the usual "griff-knives" for actuating the hooks; but these hooks are raised directly from the pattern barrels or cylinders, so as to dispense with the usual feelers or needles.

In an arrangement for carrying my invention into effect and as clearly shown in Figs. 1 and 2 of the drawings I mount the barrels or cylinders *a a'* below the sets of hooks *b b'* upon levers or links *c c*. These levers or links *c c* are jointed or connected by pivot-studs *d d* to a pivoted lever *e*, centered at *e'*. It will be clearly understood that this arrangement of levers and links is duplicated, so as to support the pattern barrels or cylinders at either end. (See Fig. 2.) In order to raise and lower the pattern-barrels *a a'* into and out of position for actuating the hooks *b b'*, I arrange to vibrate the pivoted levers *e*. This may be conveniently effected by means of an adjustable connecting-rod *f*, which is connected by swivel-joints *f' f'* to the pivoted levers *e* and to the compound lever *g*, pivoted at *g'*. This compound lever is of the usual type and is operated in the usual manner from the cam or tappet shaft or the like of the loom. A suitable length of chain *h* is passed around chain-wheels *h' h'*, mounted on the axles of the pattern barrels or cylinders, and in its course bears on each end of the pivoted lever *e*, which is provided with antifriction-bowls *h<sup>2</sup>*, upon which the chain rests, as clearly shown in the drawings. The vibration of the compound lever *g* actuates the connecting-rods *f*, so that these rods are in their turn pushed or pulled, and so rock each lever *e* on its center *e'*. The movement of the levers *e* is communicated to the links *c c*, which sustain the pattern-barrel *a a'*. From the above it will be seen that the movement of the levers *e* tends to alternately raise and lower the connected pattern barrels or cylinders *a a'*. At the time when the levers and links are cranked, as shown in full lines, Fig. 1, the upper pattern-barrel *a* is out of action while the lower pattern-barrel *a'* is in action. When the levers *e* and links *c* tend to assume a straight line, as shown in dotted lines,



Fig. 1, the upper pattern-barrel *a* is brought into action to operate the hooks *b* and the lower barrel is removed clear of the lower set of hooks. Upon the raising of either  
 5 pattern barrel or cylinder, due to the action of the ordinary compound levers *g*, the hooks are raised by the usual lags, chains, (indicated at *x'*,) or the like carried by the pattern barrel or cylinder and are operated in the  
 10 ordinary manner by the reciprocating griff-knives. To guide the pattern barrels or cylinders in their upward or downward movement, slotted or forked brackets *a*<sup>2</sup> may be employed. Fig. 1<sup>a</sup> shows a separate view of such  
 15 a bracket. Fig. 1 shows the hook *b'* as when raised ready for operation by the usual reciprocating griff-knife *k*. The hooks *b b'* when worked by the knives *k* act on the connected  
 20 balk *l* and "jack-levers" *m* and operate the same to actuate the healds in the well-known manner. The barrels *a a'* are rotated by means of the usual notched or ratchet wheel  
 25 *i*, worked by the pawl *i'* from the compound lever *g*. I have indicated this notched wheel and pawl in Fig. 2<sup>a</sup>. In the case of wide  
 30 looms the jacks *m* in one set may be connected up to a second set of jacks by a connecting rod or tie, as indicated at *m'*, Fig. 3. The healds may be pulled down by springs,  
 35 as is usual, or extensions from the jacks may be connected with a second set of jacks arranged below. By this latter arrangement better results are accomplished when working positively and dealing with heavy goods.  
 40 In order to obtain accurate working of the hooks, I propose to employ locking means to retain the hooks *b b'* in position and prevent unauthorized or premature movement of the same. To this end I employ a channeled or  
 45 other bar or bars *n*, extending across the dobbie, the ends of the hooks when down dropping into such channel or against an adjustable cup *n'*. The said bar or bars *n* may be provided with an inclined face, upon which  
 50 the hooks rest when out of action. By these means any false movement of the balks is effectually prevented. To check backward movement of the balk, transverse bars *o* may be fitted across the dobbie-framing.  
 55 In order to effect a ready and reliable connection between the hooks *b b'* and balks *l*, I provide the hooks with a trunnion *b*<sup>2</sup> and with two webs or fins *b*<sup>3</sup> *b*<sup>3</sup>. Each end of the balk is suitably formed with a hole or bearing  
 60 *l*<sup>2</sup> to receive the said trunnion *b*<sup>2</sup> and with slots or ways *l*<sup>3</sup> *l*<sup>3</sup> for the webs or fins *b*<sup>3</sup> *b*<sup>3</sup>, such slots or ways being so arranged as that in order to introduce the webs or fins it is necessary to turn the hook out of a working  
 65 position. The hook *b'* is shown as when out of a working position in Fig. 3, this part of the figure clearly showing the way in which the hook and balk are brought into connection with each other and the way the fins engage the slots. When once the fins *b*<sup>3</sup> *b*<sup>3</sup> bear in the slots *l*<sup>3</sup> *l*<sup>3</sup> and the trunnion *b*<sup>2</sup> occupies its bearing *l*<sup>2</sup>, the connection between

hook and balk is very effective and secure so long as the hook remains in a working position. A similar arrangement of fins and slots  
 70 or ways are preferably employed to connect the balks *l* to the ends of the jack-levers *m*, the fins *l*<sup>5</sup> being formed on the balks and the slots *m*<sup>3</sup> on the cranked arms of the jacks, a trunnion or bearing pin *l*<sup>4</sup> being used to en-  
 75 gage a bearing *m*<sup>2</sup> and secure an effective connection, as above described. This form of balk and jack-lever connection is clearly shown in Fig. 3. If thought desirable, the healds may be connected up to the jacks by  
 80 means of a somewhat similar arrangement of fins and slots, as is indicated in Fig. 3, so that a slight turning is permissible as the jacks lift, and the healds are not strained or deflected.  
 85

By means of the bearing or connection above described the parts are readily strung together and when connected are well supported laterally.

My improvements simplify the dobbie and  
 90 render the same more perfect in working action.

When the loom is at work, the cam or tappet shaft raises and lowers the usual connecting-rod *A*, and so operates compound lever *g*.  
 95 As lever *g* is rocked it raises and lowers, through levers and links, the card-barrels *a a'*, which are provided with the usual lags. As one or other barrel is brought into action the pins in lags operate where set to raise one or  
 100 other of the hooks in the sets *b b'*. When a pin or pins raise a hook or hooks, such hook or hooks is or are acted upon by the reciprocating griff-knife *k*. The griff-knives are worked from the compound lever *g* by the rods  
 105 *y*, dotted lines, Fig. 1. When the griff-knives act on the hook or set of hooks, the corresponding balks and connected jacks are affected so as to raise the healds or sets of  
 110 healds arranged in the looms. The raising of the healds brings about the desired shedding of the warps, as will be understood.

I declare that what I claim is—

1. In combination in a loom-dobbie, and as a means for positively or directly actuating  
 115 the hooks so as to dispense with the use of feelers or needles, the pattern cylinders or barrels *a, a'*, links or levers *c, c*, supporting same, pivoted levers *e* rocked from the usual compound levers *g*, said levers and links be-  
 120 ing surrounded by a chain *h*, said levers *e* being operated to elevate or lower each pattern-barrel as required which in turn work the hooks in the manner, for the purposes, and substantially as described.  
 125

2. In combination, in a loom-dobbie in which the cylinders act directly on the hooks, the cylinders *a, a'*, pivoted levers *e*, links *c c*, and connecting-rod *f*, the connecting-rod *f* rocking the levers *e*, which in turn control the  
 130 raising and lowering of the cylinders which operate the hooks, in the manner, and substantially as described.

3. In combination, in a loom-dobbie, cylin-



ders *a a'* links *c c* and pivoted levers *e*, the  
levers *e* being actuated to raise and lower said  
cylinders which operate the sets of hooks *b b'*,  
griff-knives *k* for working hooks, and rests *n*,  
5 for said hooks when out of action, the com-  
bined parts acting, in the manner, and sub-  
stantially as described.

10 4. In loom-dobbies the improved form of  
bearing or connection for securing or string-  
ing together the hooks and barks, barks and  
jacks, &c., the bearing consisting of a part  
formed with a trunnion *b<sup>2</sup>*, *l<sup>4</sup>* and two fins *b<sup>3</sup>*,

*l<sup>5</sup>*, the trunnions engaging circular apertures  
*l<sup>2</sup>*, *m<sup>2</sup>*, and the fins engaging curved recessed  
slots *l<sup>3</sup>*, *m<sup>3</sup>*, so that in a working position the 15  
parts are securely connected together, in the  
manner and substantially as described.

In witness whereof I have hereunto set my  
hand in presence of two witnesses.

JOSEPH HIGHTON.

Witnesses:

RICHARD IBBERSON,  
ALFRED YATES.