

(No Model.)

O. W. SCHAUM.
FRICTION LET-OFF DEVICE FOR LOOMS.

No. 452,021.

Patented May 12, 1891.

Fig. 1.

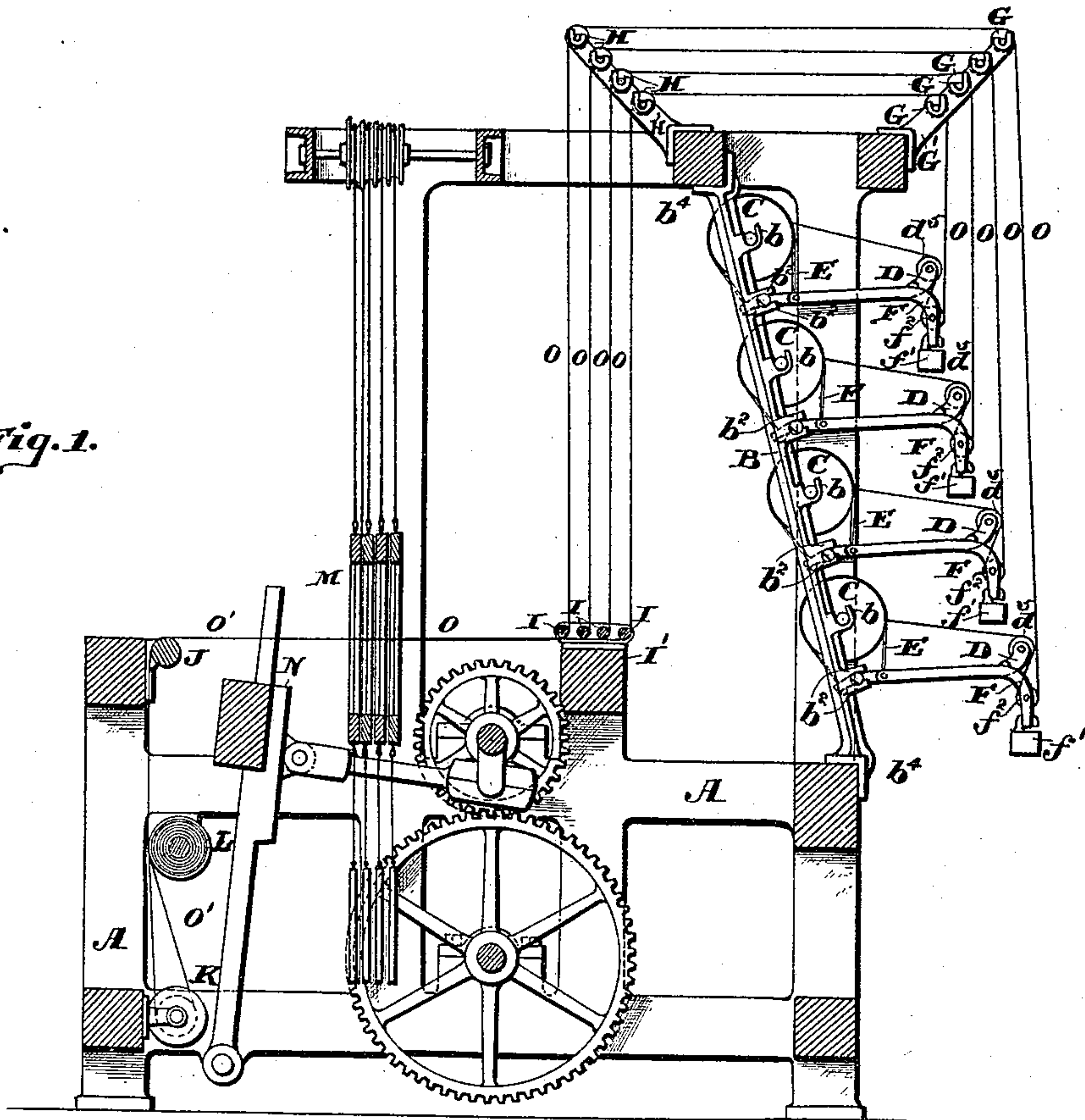
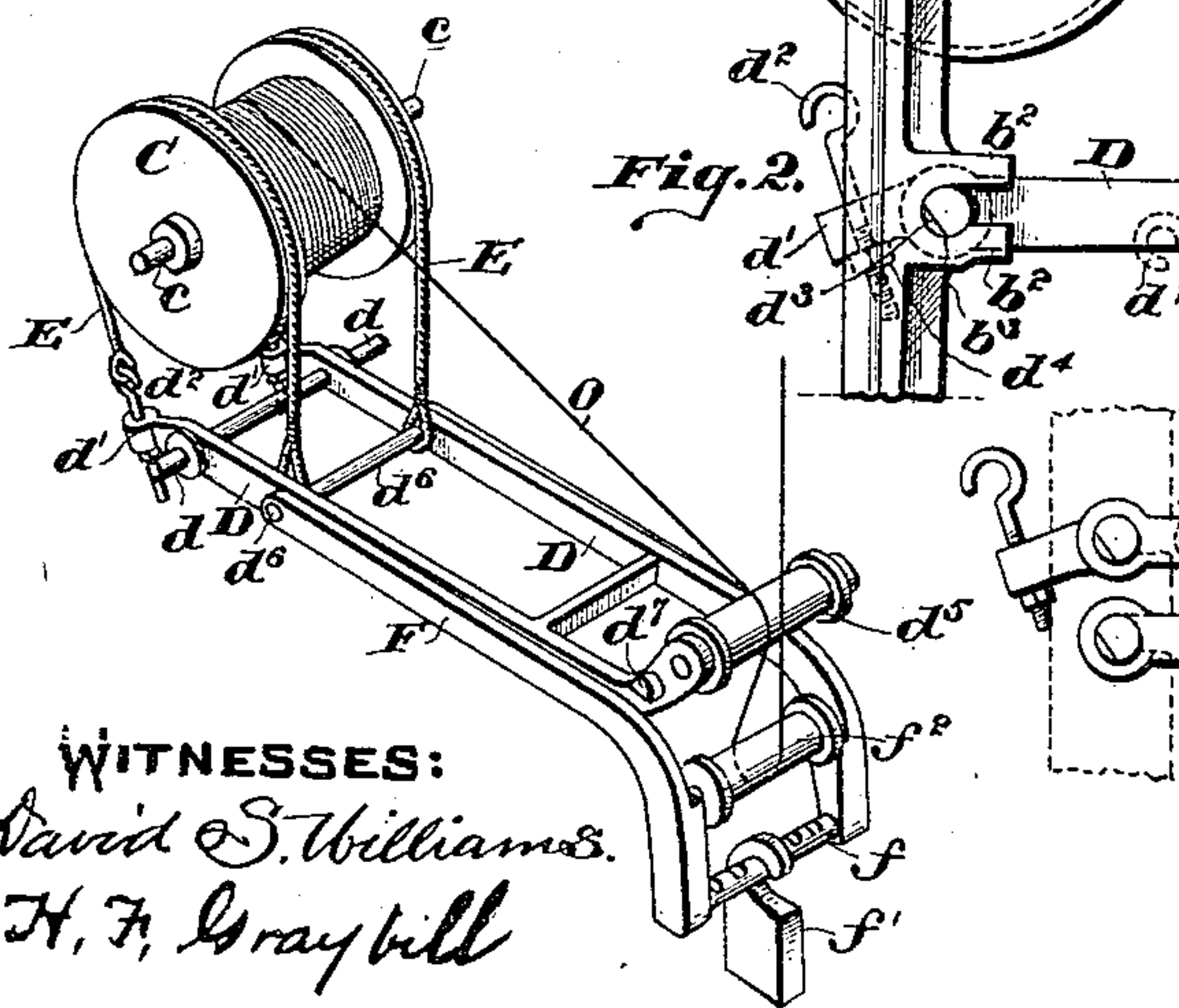


Fig. 3.



WITNESSES:
David S. Williams.
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Fig. 2.

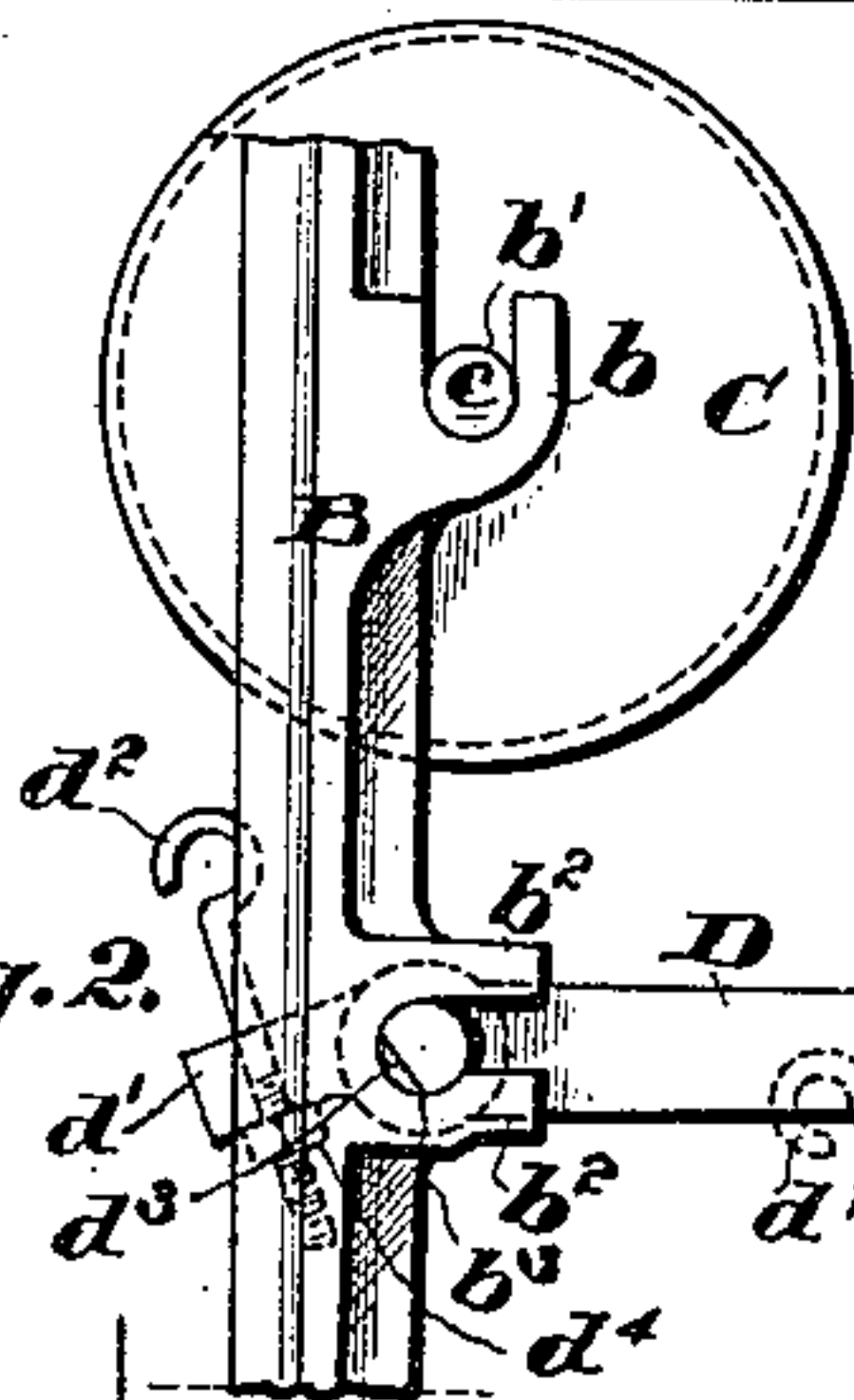
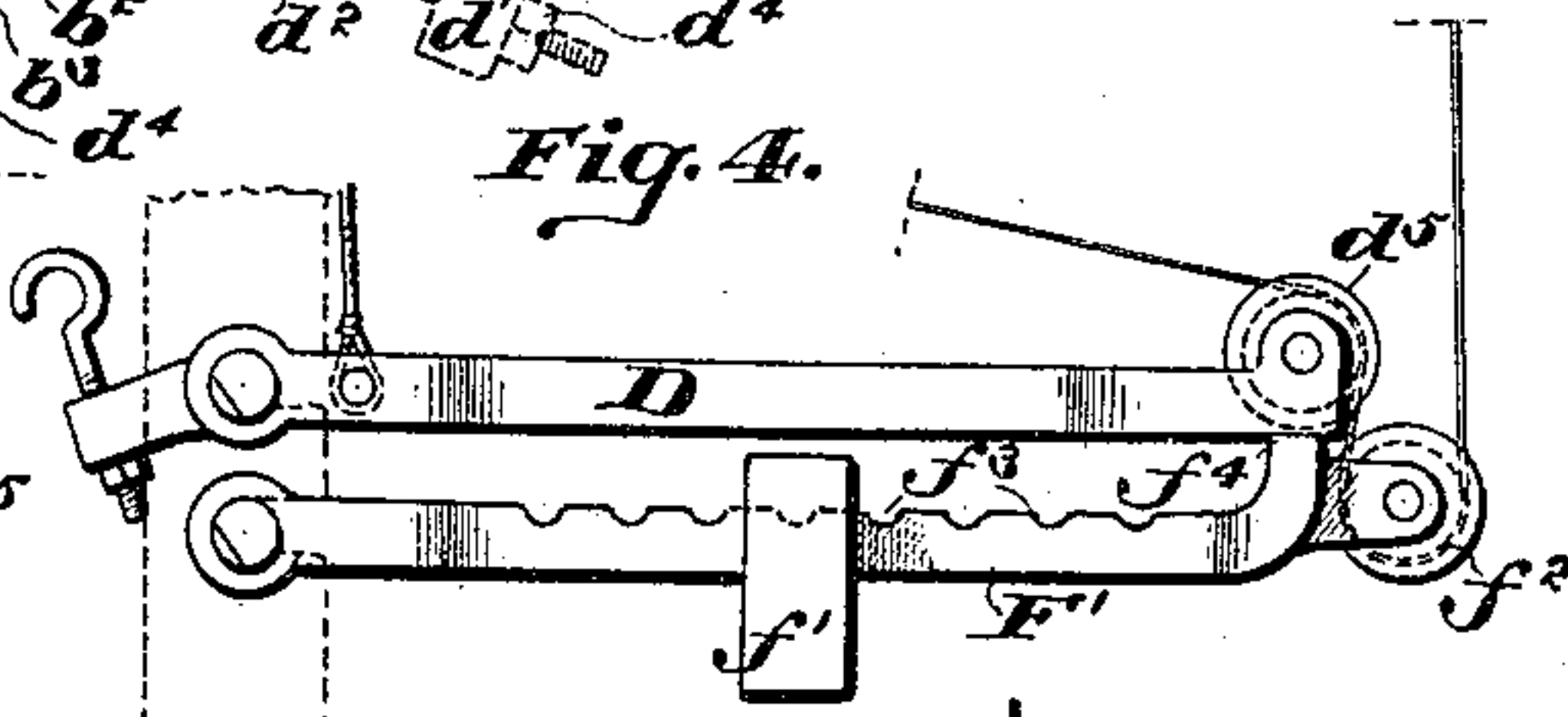


Fig. 4.



INVENTOR

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FRICTION LET-OFF DEVICE FOR LOOMS.

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Application filed May 20, 1890. Serial No. 352,449. (No model.)

To all whom it may concern:

Be it known that I, OTTO W. SCHAUM, of Philadelphia, county of Philadelphia, State of Pennsylvania, have invented a certain new and useful Improvement in Friction Let-Off Devices for Looms, of which the following is a true and accurate description, reference being had to the drawings which form a part of this specification.

My invention relates to the construction of the let-off and tension devices which regulate the movement of the warp-threads from the yarn-beam to the cloth-beam.

My object is to improve these devices so that they will act with great nicety and uniformity both in feeding the yarn or warp threads from the beam, and in stretching the threads to a uniform tension before they reach that part of the loom in which they are woven into cloth.

The nature of my improvements will be best understood as described in connection with the drawings in which they are illustrated, and the novel features which I desire to secure by Letters Patent are hereinafter clearly set forth in the claims.

In the drawings, Figure 1 is a side elevation of a loom provided with my improvements. Fig. 2 is a view of a portion of a warp-beam stand, showing the beam and part of a let-off lever connected. Fig. 3 is a perspective view showing the beam and let-off levers with their connections, and Fig. 4 is a side elevation of a modification of my let-off device.

A is the frame of the machine; B, the beam-stand, which is secured to the frame A at b^4 b^4 , and in an oblique position, as shown. The beam is formed of cast metal, and is provided with bearings b' for the journals of the beams, said bearings being formed by a projecting lug b , and being open at the top, as shown. Below these bearings b' other bearings b^3 are formed between outwardly-projecting lugs b^2 b^2 . The outwardly-opening passage into the journals b^3 is contracted, as shown. These bearings are intended to receive the journals of the let-off lever or levers, and there may be either one or two such bearings beneath each of the bearings provided for the beams. (See Figs. 2 and 4.)

C is the yarn-beam provided with heads of

the usual kind and with journals c c , which fit into the bearings b' of the stand.

D is a let-off lever provided with journals d , cut away on one side, as indicated at d^3 , so that they can be slid into the bearings b^3 through its contracted outward opening when held in the position indicated in dotted lines at the right of Fig. 2. After being inserted in the bearings in this way the lever is turned down to the position indicated in full lines, and the journals are thereby securely locked in their bearings. At the free end of the let-off lever D a roll d^5 is journaled, and preferably I form a heel-extension d' back of the journals d .

d^2 is a hook passing through a perforation in each heel-extension and provided with an adjusting-nut d^4 , as shown.

E E are friction-bands, which, as shown, are secured at one end to the hook d^2 and pass over the heads of the beam C, connecting again with the lever D at a point d^6 , having a greater leverage in front of the bearings of the lever than have the heel-extensions behind said bearings.

F, Figs. 1 and 3, is a lever which, as there shown, is pivoted at d^6 to the lever D. At or near its free end it is provided with a roll f^2 , which is arranged so that its inner face will come substantially in line with or behind the outer face of the roll d^5 .

f is a notched cross-bar, on which weights f' can be secured in proper amount to regulate the tension of the let-off device.

In the modification illustrated in Fig. 4 the lever F is replaced by a lever F' , which is journaled in the stand instead of to the lever D, and a longitudinally-extending notched bar f^3 permits the weight f' to be adjusted to and from the fulcrum.

G' is a stand or arm extending obliquely above the rolls f^2 and provided with a set of pulleys or spools G G, &c., equal in number to the beams, and over each of which passes a thread.

H' is an obliquely-set arm or stand having a series of pulleys or spools H H, &c., journaled upon it.

II, &c., are guide-rods secured to the beam I'.

J is a rod secured upon the breast-beam.

K is a tension-roll.

L is the cloth-beam.

M are the heddles.

N is the lay.

O O, &c., are the warp-threads; O', the cloth.

5 The operation of my improved device is as follows: The parts are put together, as shown in the drawings, and the warp-thread O is then led from the beam C over the roll d^5 , under the roll f^2 , thence over corresponding
10 rolls G and H, situated above the beams, and from the rolls or spools H H, &c., the threads pass down over the guide-rods I I, &c., thence across the heddles M and lay N to the breast-beam, and thence to the cloth-beam. As the
15 cloth is taken up on the cloth-beam L, the warp-threads are drawn upward over the rolls G, and, passing under the rolls f^2 , as they do, they draw the lever F upward until it comes in contact with a stop, such as is indicated
20 at d^7 , Fig. 3, or f^4 , Fig. 4. Further upward movement of the lever F or F' is then accompanied by an upward movement of the lever D, which, of course, loosens the grip of the friction-bands E on the heads of the beam C,
25 permitting the beam to turn and the warp-threads to run out until the lever F again falls below the stop on the lever D, when of course the lever D is again drawn down, applying the friction-bands to the beam.

30 In looms adapted to work upon very delicate fabrics it is of great importance that the tension device should be such as will permit of very nice adjustment, and an adjustment which will not vary to any appreciable extent. This desirable quality is secured in my
35 device, first, by the construction by which the roll f^2 is placed with its inner face below and substantially in line with or behind the outer face of the roll d^5 . By this arrangement
40 the angles through which the thread passes and the leverage it exerts between the two rolls spoken of do not materially vary as the rolls move to and from each other, while in older constructions, in which a roll f^2
45 was placed considerably in advance of a roll d^5 , any change in the position of the rolls materially changed the leverage through which the warp-thread passing over them acted. The next device by which the de-
50 sired uniformity of action is obtained is that by which the lever F is pivoted, substantially at or behind the point at which the friction-bands E are attached to the lever D. This lever F may be attached to the lever D, as
55 shown in Fig. 3, or to the beam-stand B, as indicated in Fig. 4. By making its point of pivotal attachment at or behind the point where the friction-bands are secured the motion of the roll f^2 with respect to the roll d^5 is for the small
60 arc through which it travels substantially a perpendicular distance, and in this way the angles through which the warp-thread passes over the two rolls remain substantially unchanged. A third feature of advantage is the
65 attachment of the friction-bands to the short heel-extensions d' of the lever D. By this construction the effective motion of the fric-

tion-band with regard to the beam is a function of the difference between the leverage of its two points of attachment, and by thus dif- 70
ferentiating, as it were, the motion of the friction-band I am enabled to greatly improve the uniformity of the tension. To facilitate the adjustment of the friction-bands, I provide the hook d^2 , the shank of which passes 75
through a perforation in the heel d' , and is provided with an adjusting-nut d^4 .

With delicate goods it is very important that the warp-threads should be of perfectly even tension at the place and time when they 80
are woven into cloth, and experience shows that in winding the threads upon the beam they are very liable to be subjected to uneven tensions, and that in ordinary looms they are not thoroughly and uniformly stretched be- 85
fore being woven. In order to insure that all the threads should be uniformly stretched and of even tension I arrange the oblique arm or stand G' above the rolls on the let-off levers and journal upon it the rolls G G, &c., 90
over which the different threads pass, and also at the top of the loom I arrange the other oblique arm or stand H', with the rolls H H, &c., corresponding to the rolls G G, &c. The
95 said rolls or spools H are placed above the guide-rods I. By passing the warp-threads first over the rolls of the let-off levers, then upward over the spools G, thence across over the spools H, and thence down to the guide-
100 rods I, I provide for a very considerable length of warp-thread being under tension after it leaves the beam and before it is woven, and in this way thoroughly equalize the strains and tensions of the threads.

Having now described my invention, what I claim as new, and desire to protect by Let- 105
ters Patent, is—

1. In an automatic let-off and tension device for looms, the combination, with the warp beam and stand, of a lever D, pivoted to the 110
stand below the beam, friction-bands E E, passing over the heads of the beam and supporting lever D, a roll d^5 at the end of lever D, a pivoted lever F, and a roll f^2 , journaled on lever F in such position as to bring its in- 115
ner face below and substantially in line with or behind the outer face of roll d^5 , all substantially as and for the purpose specified.

2. In an automatic let-off and tension device for looms, the combination, with the warp 120
beam and stand, of a lever D, pivoted to the stand below the beam and having heel-extensions d' , friction-bands E E, passing over the beam-heads, secured at one end to the heels d' of lever D and at the other end to points 125
of the lever having greater leverage in front of its pivot than the heel-extensions, a roll d^5 at the end of lever D, a pivoted lever F, and a roll f^2 , journaled on lever F in such position as to bring its inner face below and substan- 130
tially in line with or behind the outer face of roll d^5 , all substantially as and for the purpose specified.

3. In an automatic let-off and tension de-

vice for looms, the combination, with the warp beam and stand, of a lever D, pivoted to the stand below the beam, friction-bands E E passing over the heads of the beam and supporting lever D, a roll d^5 at the end of lever D, a lever F, pivoted at or behind the point of attachment of the friction-bands, and a roll f^2 , journaled on lever F with such position as to bring its inner face below and substantially in line with or behind the outer face of roll d^5 , all substantially as and for the purpose specified.

4. In an automatic let-off and tension device for looms, the combination, with the warp beam and stand, of a lever D, pivoted to the stand below the beam, and having heel-extensions d' , adjustable hooks d^2 , secured in the heel-extensions d' , friction-bands E E, passing over the beam-heads, secured at one end to the hooks d^2 and at the other end to points of the lever having greater leverage in front of its pivot than the heel-extensions, a roll d^5 at the end of lever D, a pivoted lever F, and a roll f^2 , journaled on lever F in such position as to bring its inner face below and substan-

tially in line with or behind the outer face of roll d^5 , all substantially as and for the purpose specified.

5. The beam and tension-lever stand B, having upwardly-opening journal-bearings b' for the beams, and outwardly-opening narrow-mouthed journal-bearings b^3 , situated below the journal-bearings b' , to receive the pivots of the tension lever or levers.

6. The combination, with the frame A, of a loom, the obliquely-set beam-stand B, carrying beams C, and automatic let-off levers D and F in sets of similar length, said levers being provided with bands E and rolls $d^5 f^2$, as described, the set of obliquely-arranged spools G G, &c., arranged above corresponding let-off levers, the set of obliquely-arranged spools H H, &c., arranged in front of spools G and above the corresponding rods I I, &c., on the warp-beam I', and the rods I I, &c., all substantially as and for the purpose specified.

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Witnesses:

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