

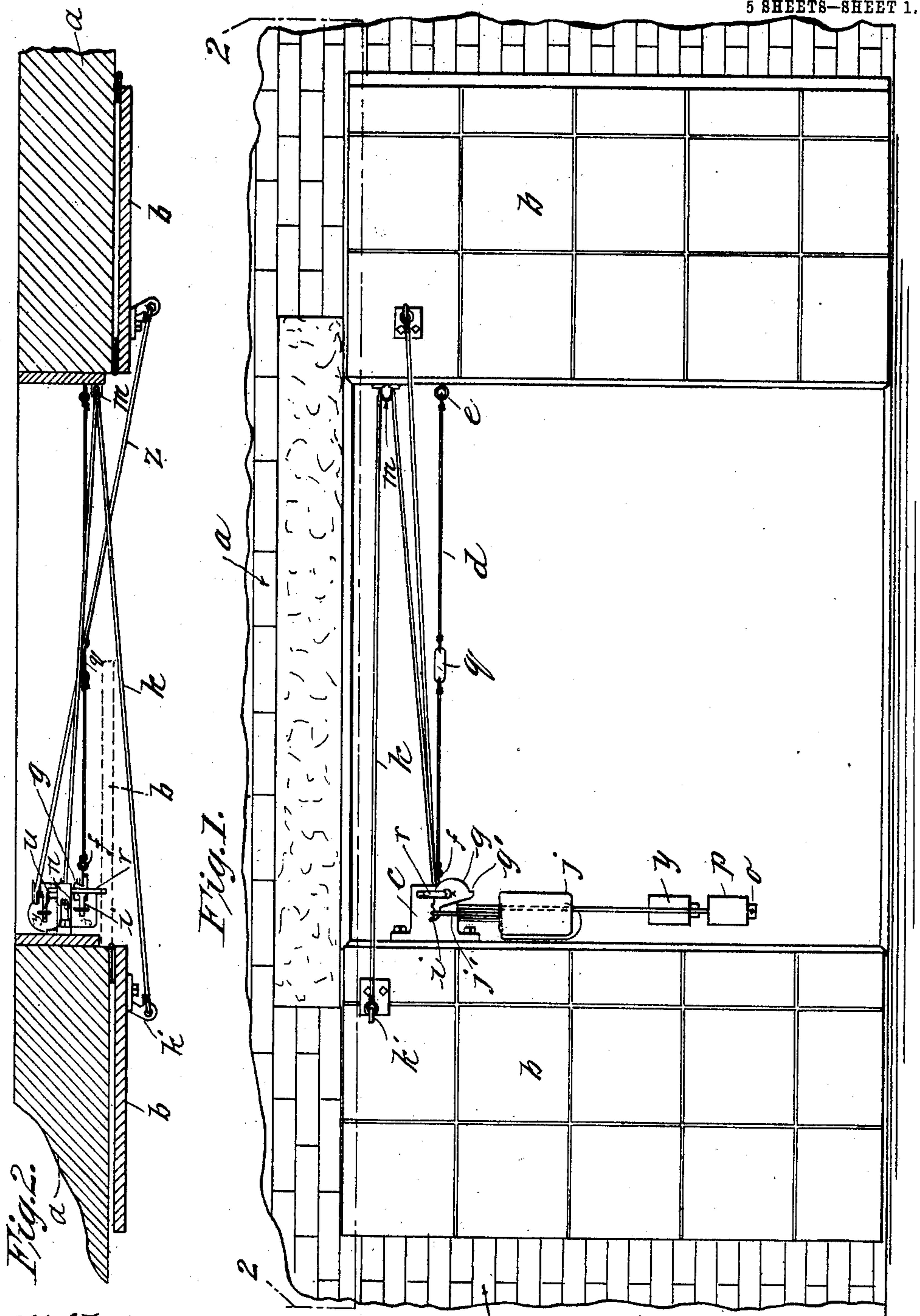
No. 826,574.

PATENTED JULY 24, 1906.

F. HUDSON.  
AUTOMATIC DOOR CLOSING DEVICE.

APPLICATION FILED NOV. 13, 1905.

5 SHEETS—SHEET 1.



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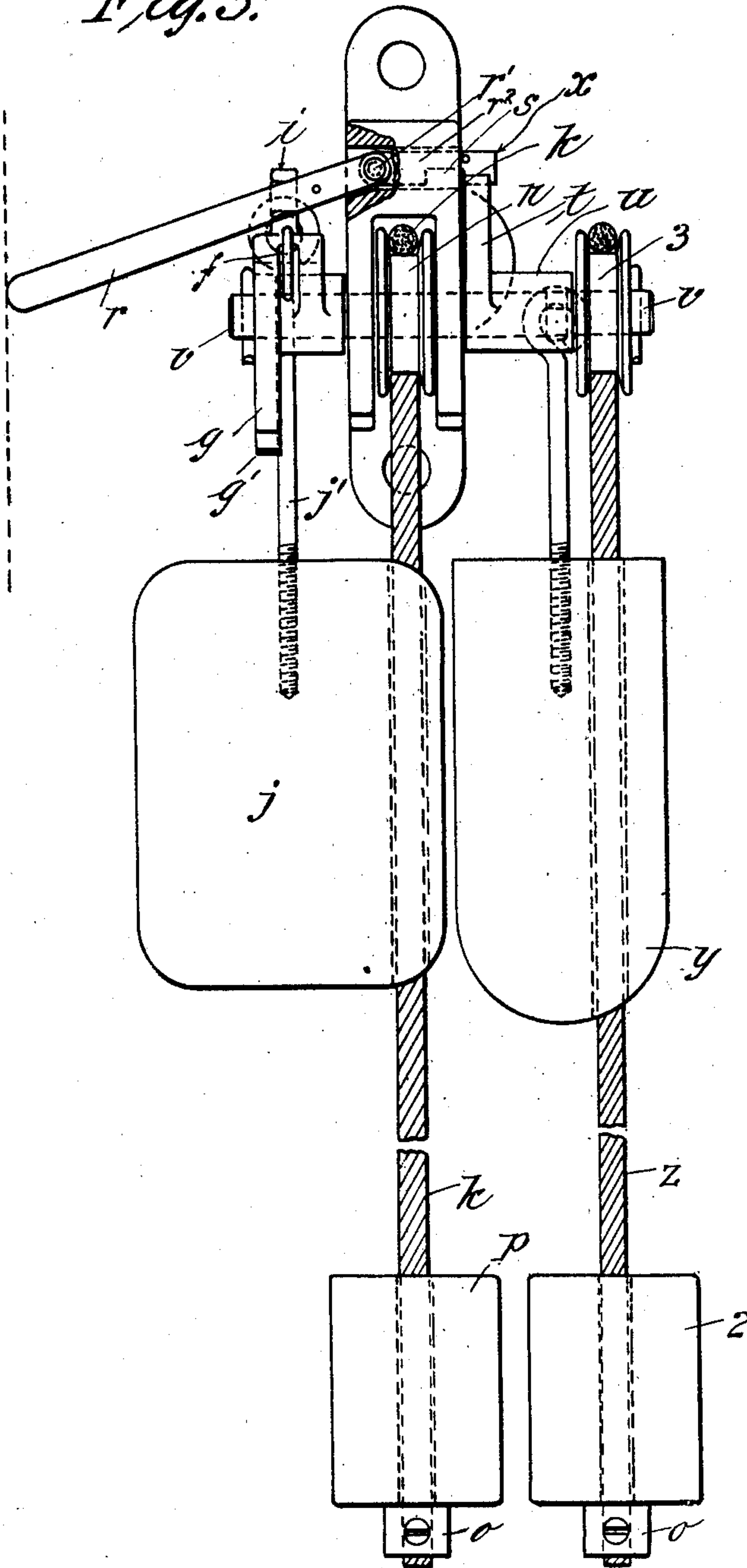
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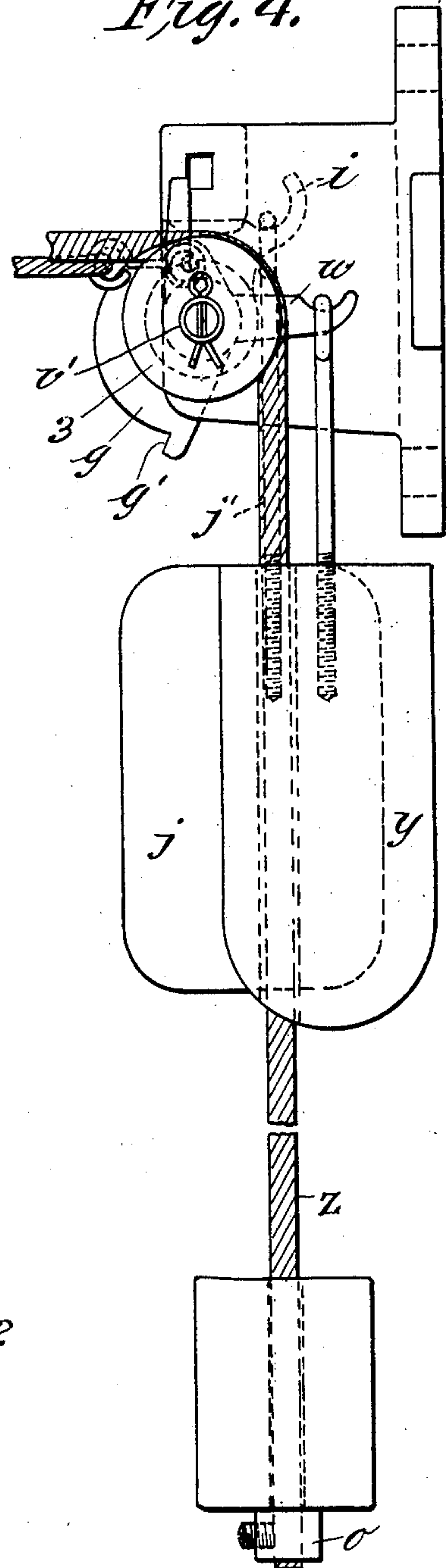
5 SHEETS—SHEET 2.

Fig. 3.



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Fig. 4.



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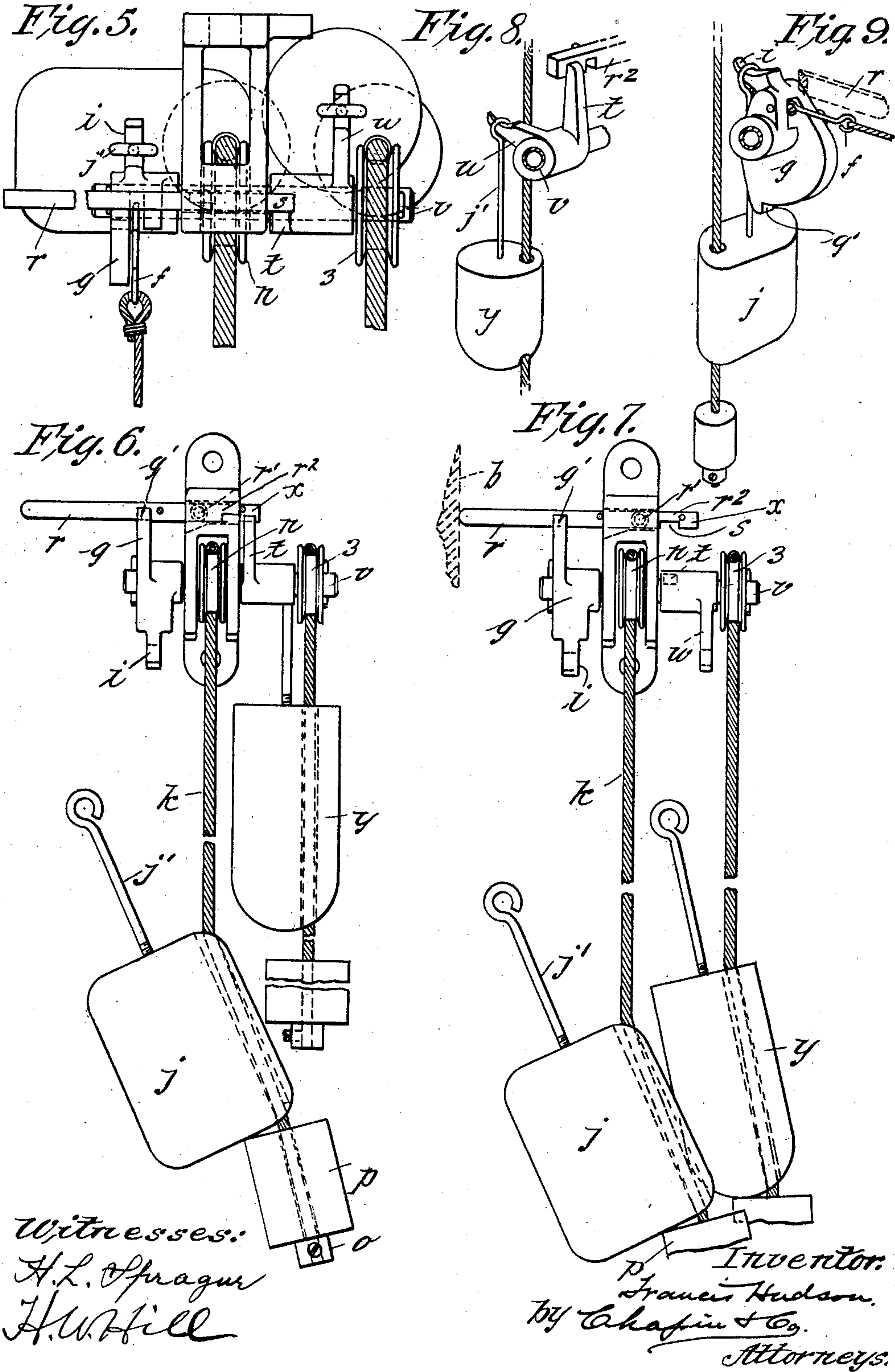
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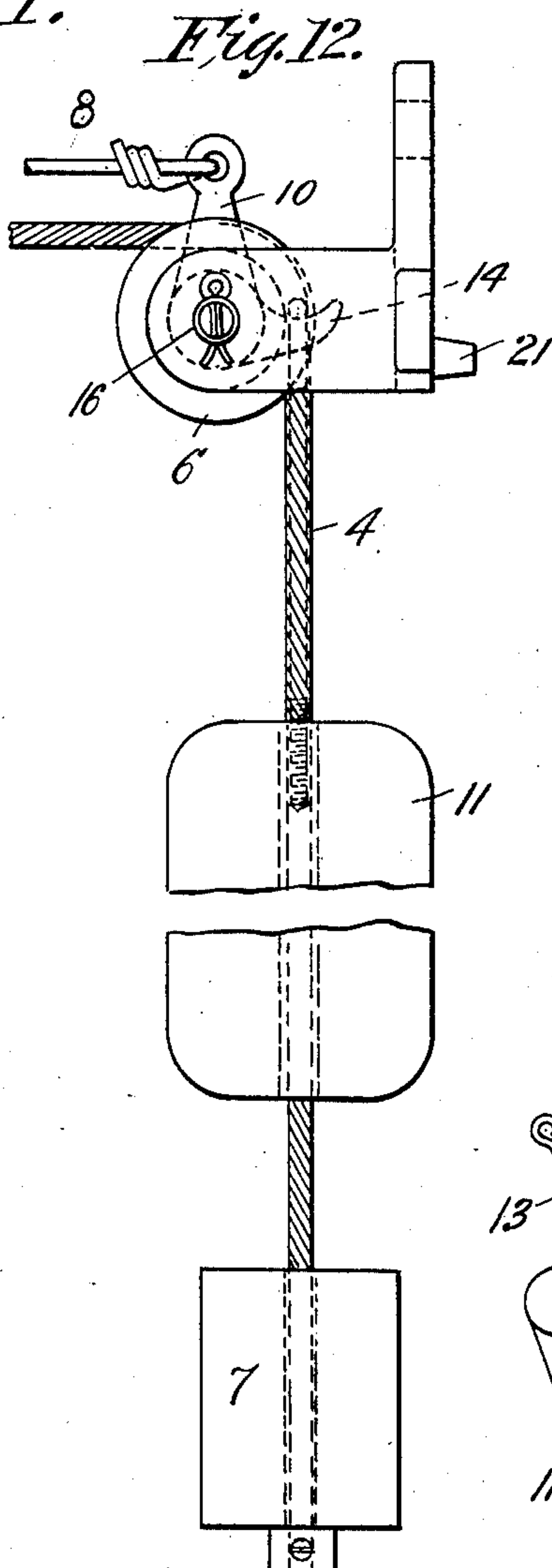
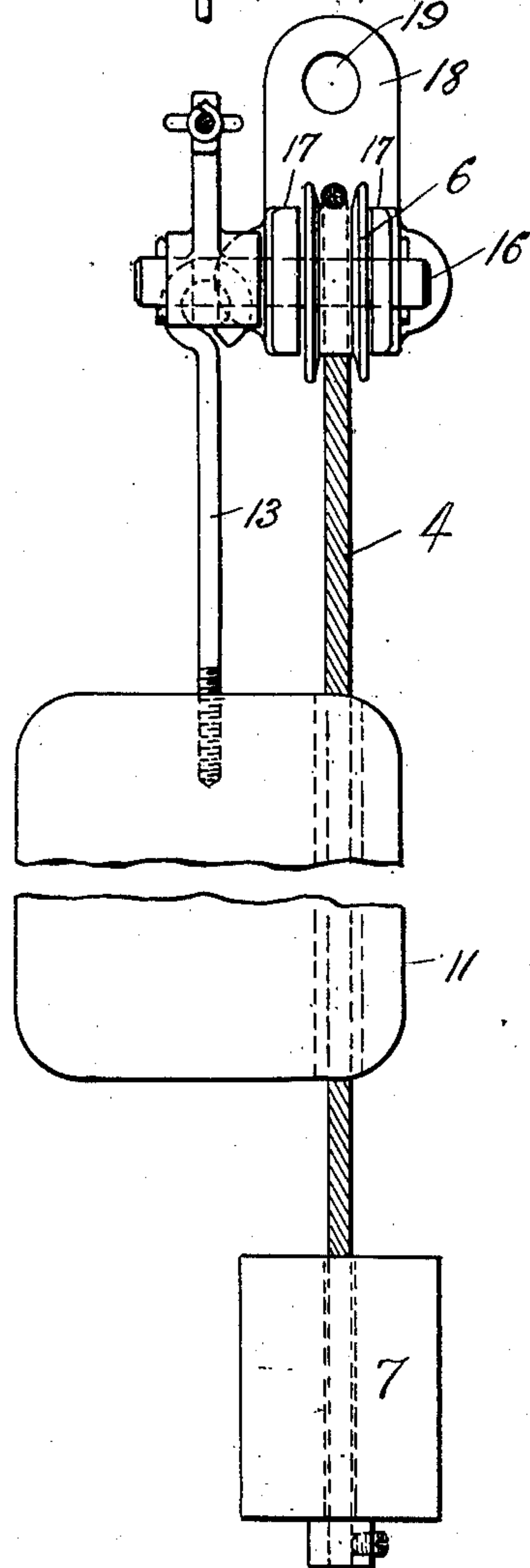
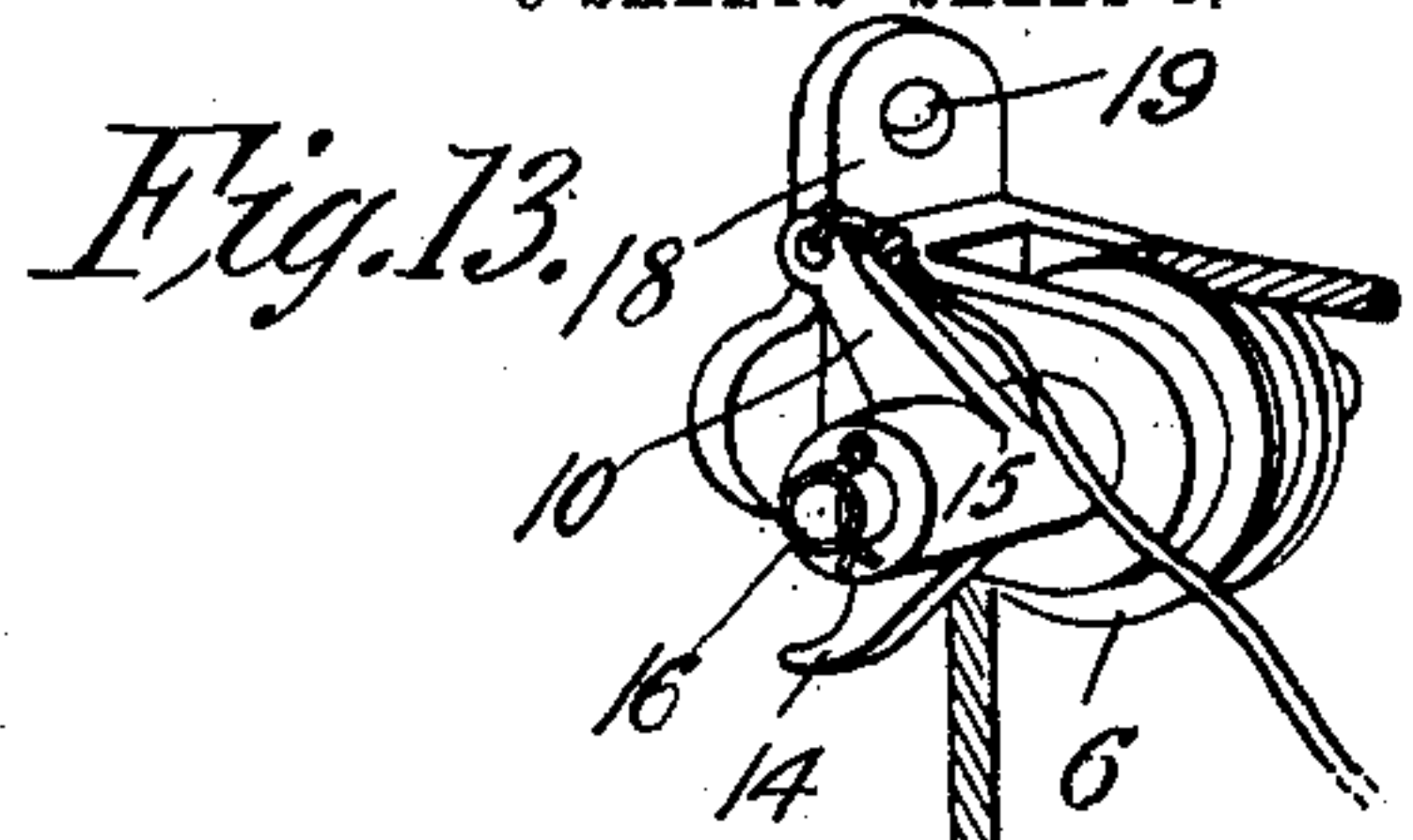
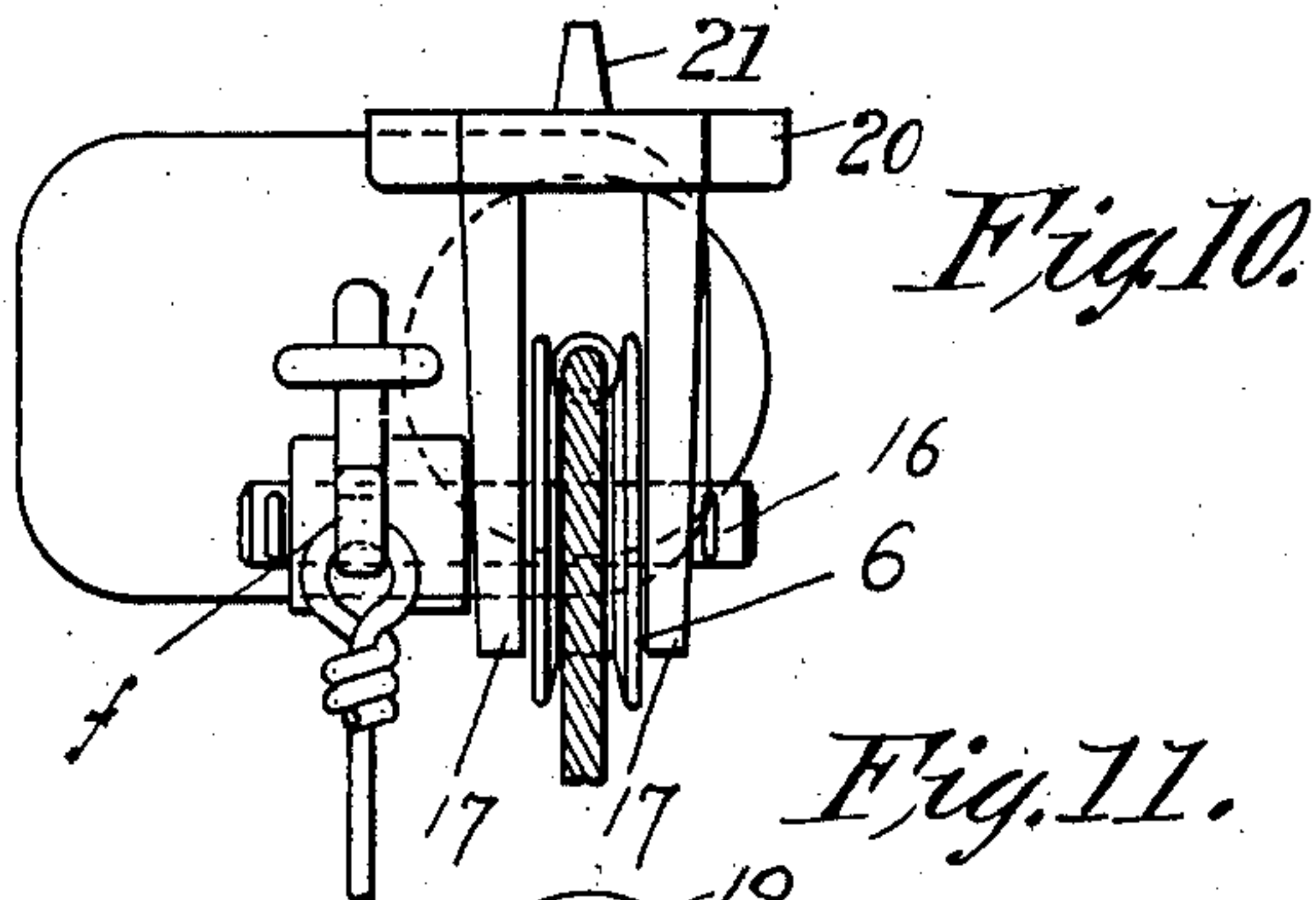
5 SHEETS—SHEET 3.





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5 SHEETS—SHEET 4.



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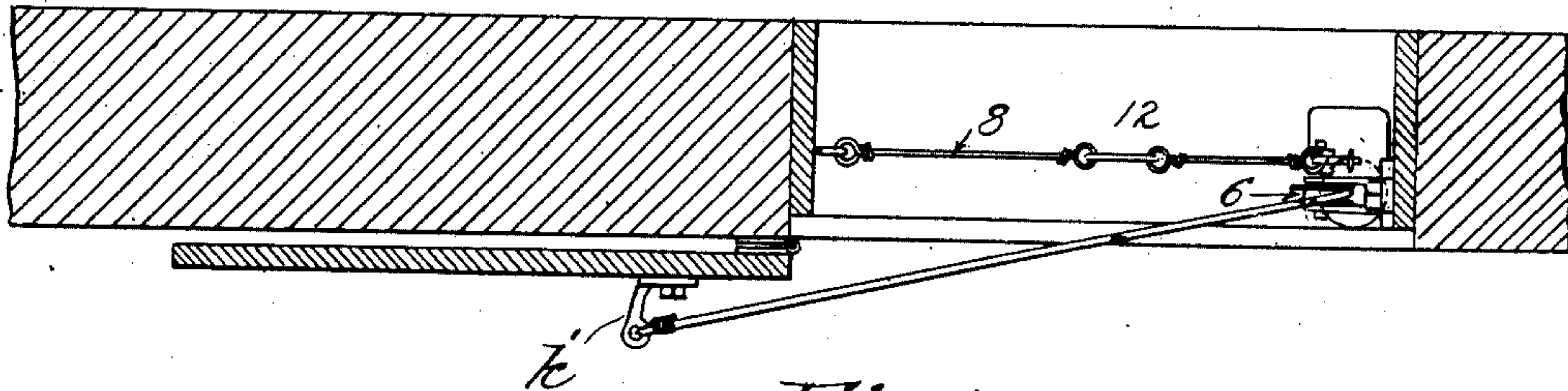
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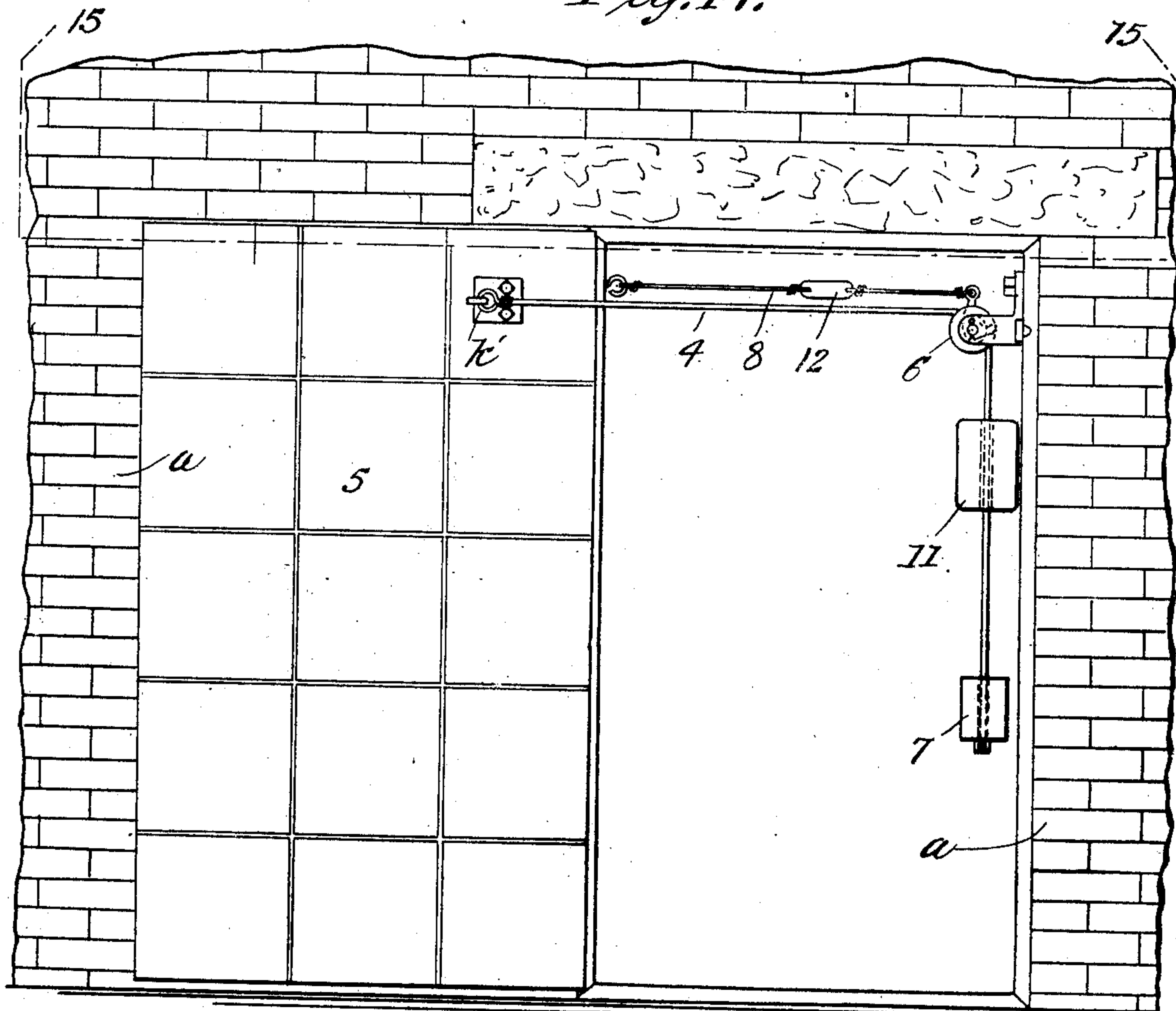
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5 SHEETS—SHEET 6.

*Fig. 15.*



*Fig. 14.*



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# UNITED STATES PATENT OFFICE.

FRANCIS HUDSON, OF FAIRVIEW, CHICOPEE, MASSACHUSETTS, ASSIGNOR  
TO COBURN TROLLEY TRACK MANUFACTURING COMPANY, OF WIL-  
LIMANSETT, MASSACHUSETTS, A CORPORATION.

## AUTOMATIC DOOR-CLOSING DEVICE.

No. 826,574.

Specification of Letters Patent.

Patented July 24, 1906.

Application filed November 13, 1905. Serial No. 287,117.

*To all whom it may concern:*

Be it known that I, FRANCIS HUDSON, a citizen of the United States of America, residing at Fairview, Chicopee, in the county of Hampden and State of Massachusetts, have invented new and useful Improvements in Automatic Door-Closing Devices, of which the following is a specification.

This invention relates to the class of automatic door-closing devices, and has for its object to quickly and safely close the passage-way leading from one room or apartment to another in order to prevent the spread of flames soon after the fire originates.

The invention broadly consists in providing means to close a door or doors when the temperature of the room reaches a certain critical point as determined by the melting-point of a fusible strip of any material suitable for the purpose which normally suspends a weight and puts into operation the automatic door-closing devices. When this weight is released and the device is started, a second weight falls and closes a second door in case two doors are used.

In the drawings forming part of this application, Figure 1 is a side elevation showing a doorway with the doors open and the device normally at rest. Fig. 2 is a horizontal sectional view on the dotted line 2 2 of Fig. 1. Fig. 3 is a front elevation, on an enlarged scale, of the device when used for two doors. Fig. 4 is a side elevation of the same. Fig. 5 is a plan of the structure shown in Fig. 3. Fig. 6 shows the device after the fusible metal has released one of the weights and started one of the doors. Fig. 7 shows the device after both weights have fallen. Figs. 8 and 9 are detail views of the device. Figs. 10, 11, 12, and 13 are modifications for use when only one door is to be closed. Fig. 14 shows in side elevation the modification used to close one door. Fig. 15 shows a horizontal sectional view on line 15 15 of Fig. 14 of the modified form.

Referring to the drawings, *a* indicates a part of the structure of the building; *b b*, the doors; *c*, the casting, which carries the rope-pulleys and is secured to the door-frame and also supports the cam-disk hereinafter referred to.

*d* designates a wire secured at one end at

the point *e* to the door-frame and connected at its other end to a hook having an eye *f*, secured to the cam-piece *g*. This piece is rotatably mounted on the shaft *v*, which is preferably made of brass tubing to prevent rust interfering with the operation of the cam. Integrally cast with the cam-piece *g* is a hook *i*. Normally supported from this hook *i* is a weight *j* by means of an eyebolt *j'*.

*k* designates a rope which is secured at one end to the door *b* at the left of Fig. 1 by means of any suitable bracket or arm *k'* and passes over a pulley *m*, secured on the opposite side of the door-frame, and from thence passes over the sheave-wheel *n* (shown in Figs. 3, 5, 6, and 7) and downwardly to within a short distance of the floor. Secured by a set-screw on the free end of this rope is a block *o*, and immediately above this block is a stop-block *p*, through which the rope *k* loosely passes.

The weight *j*, mentioned above, when released from the hook *i* on the rotatable cam *g* by reason of the parting or breaking of the fusible strip of metal *q* in the wire *d* drops and slides freely down the rope *k*, as shown in Fig. 6, striking the stop-block *p* and transferring its weight to the rope *k*, thus closing the door *b*. (Shown at the left of Fig. 2 in the dotted-line position.) In this position the door *b* strikes the pivoted lever-arm *r*. This lever is pivoted at *r'* to a sliding piece *r<sup>2</sup>*. Normally the lever-arm *r* is in the inclined position shown in Fig. 3. The pivot-pin at *r'* is preferably made of brass to prevent rust.

The weight *j* in falling instantly imparts to the rotatable cam *g* a rotary movement, which rotary movement is stopped by the shoulder *g'*, Figs. 1, 3, 6, and 7. The cam *g* lifts the pivoted lever-arm *r* into a horizontal position, as clearly shown in Fig. 6. Upon the door striking the arm in this position the same is pushed forward, as shown in Fig. 7, through the casting *c*, bringing the slot *s* in the other member *r<sup>2</sup>* of the lever opposite the arm *t* on the opposite side of the casting *c*. This arm *t* is integral with a hub *u*, rotatably mounted on the opposite end of the shaft *v* from the cam *g*. At right angles with the arm *t* is a weight-supporting arm *w*, also integral with the hub *u*. When the slot *s* is pushed in by the door *b* opposite the arm *t*, which is normally held from rotation by the



end  $x$  of the other member  $r^2$  of the lever, the weight  $y$ , which is supported on the weight-supporting arm  $w$ , is released and slides freely down the rope  $z$ , striking the stop-block 2, which is supported in the same manner and for the same purpose as the block  $p$ , heretofore referred to. This rope  $z$  passes freely over a second sheave-wheel 3, which is carried on the shaft  $v$ . (Clearly shown in Figs. 3, 5, 6, and 7.) Thence it passes to the second door  $b$ , to which it is secured, as shown at the right of Figs. 1 and 2. The weight  $y$  thus closes the other door.

The modified arrangement whereby only one door is closed is shown in Figs. 10 to 15, inclusive. Referring to Fig. 14, the rope 4 is secured at one end to the door 5 and passes over a sheave-wheel 6, thence downwardly, and carries a stop-block 7 at its lower end, as described above. The reference-numeral 8 indicates the wire secured at one end to the door-casing and at its opposite end to an arm 10, as shown in Fig. 13, and normally supporting the weight 11, as shown in Figs. 12 and 14. The weight 11 is normally supported by an eyepiece 13 on the hooked arm 14, which is cast integral with the hub 15, which is loosely mounted on the shaft 16, which extends through two arms 17, that are cast integral with the back piece 18, having holes 19 drilled therein for the purpose of securing the same to the door-frame. Loosely mounted on the shaft 16 is a sheave-wheel 6, over which passes the rope 4, one end of which is secured to the door 5, heretofore mentioned. When the fusible strip 12 is melted, the weight 11 is released from the arm 14, allowing the same to fall or slide freely down the rope 4, striking the stop-block 7, and transferring its weight to the rope 4, thus closing the door 5. Integral with the casting 20 are burs 21, adapted to be driven into the woodwork for rigidly holding the lower end of the casting 20 from lateral movement.

The shaft  $v$ , referred to above, is preferably made of steel tubing covered with a thin brass tubing, the inner steel tube furnishing the required strength, while the outer tubing (of brass) prevents any possibility of the parts becoming rigidly secured by rust or corrosion, as would be the case if the brass tubing were not used.

It is of course obvious that the ropes used are made of wire, or an iron chain may be used, in order that the same may not be destroyed by the fire and prevent the operation of the device at the critical moment when the flames start.

Having thus described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

1. In an automatic door-closing device, a casting, two arms integral therewith, a shaft

passing through said arms, a pulley located on the shaft, a hub located at one side of one of said arms and carrying two arms at right angles to said hub.

2. In an automatic door-closing device, a casting, a shaft loosely mounted in said casting, pulleys loosely mounted on said shaft, a rotatable cam loosely mounted at one end of said shaft, a lever pivoted above said cam and normally engaging said rotatable cam in an inclined position, and means for rotating said cam.

3. In an automatic door-closing device, a casting, means for securing said casting to a fixed support, a pivoted lever slidably mounted therein, said lever being normally in an inclined position, a member carried by said casting and pivotally secured to said first-mentioned lever, and means for bringing said lever into alinement with said member.

4. In a device of the class described, the combination of a casting, a shaft loosely carried thereby, a rotatable cam loosely carried on one end of said shaft, a hub loosely carried on the opposite end of said shaft, said hub having an arm and a weight-supporting arm at right angles to each other and integral therewith, a pulley or sheave-wheel adjacent said hub, weights normally suspended by said rotatable cam and said weight-supporting arm, and means for releasing said weights.

5. In an automatic door-closing device in combination, a door-frame, doors pivoted thereto at opposite sides of the same, two ropes, secured at one end to opposite doors and passing in opposite directions over pulleys supported on said door-frame, stop-blocks on the free end of said ropes, a casting rigidly secured on one side of said door-frame, said casting loosely carrying a shaft, and pulleys loosely mounted on said shaft one of said pulleys being located substantially midway the length of said shaft, the other of said pulleys being located near one end of said shaft, a rotatable cam loosely mounted on said shaft and having a weight-supporting arm and a weight carried thereby, an abutment on said rotatable cam, a slide-way in said casting, a member slidable therein, a lever loosely pivoted to said slidable member and normally resting in an inclined position upon said rotatable cam, a slot or cut-out portion in said member, a part of said member normally extending beyond the casting, a hub loosely mounted on said shaft and carrying an arm normally engaging the extended end of said member, a weight-supporting arm at right angles to said arm, and a weight carried thereby, a wire, one end of which is fixedly secured to said door-frame, the other end of which is secured to an eyebolt in said rotatable cam, a strip of fusible

material in said wire whereby when the fusible material in said wire is melted the first of said weights is released causing the rotatable cam to lift the lever into a horizontal position in alinement with said member and  
5 permitting one of said doors to push said lever and member in a horizontal direction and

bring the arm into alinement with said slot whereby said second weight is released and causes the second door to be closed.

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Witnesses:

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