

(No Model.)

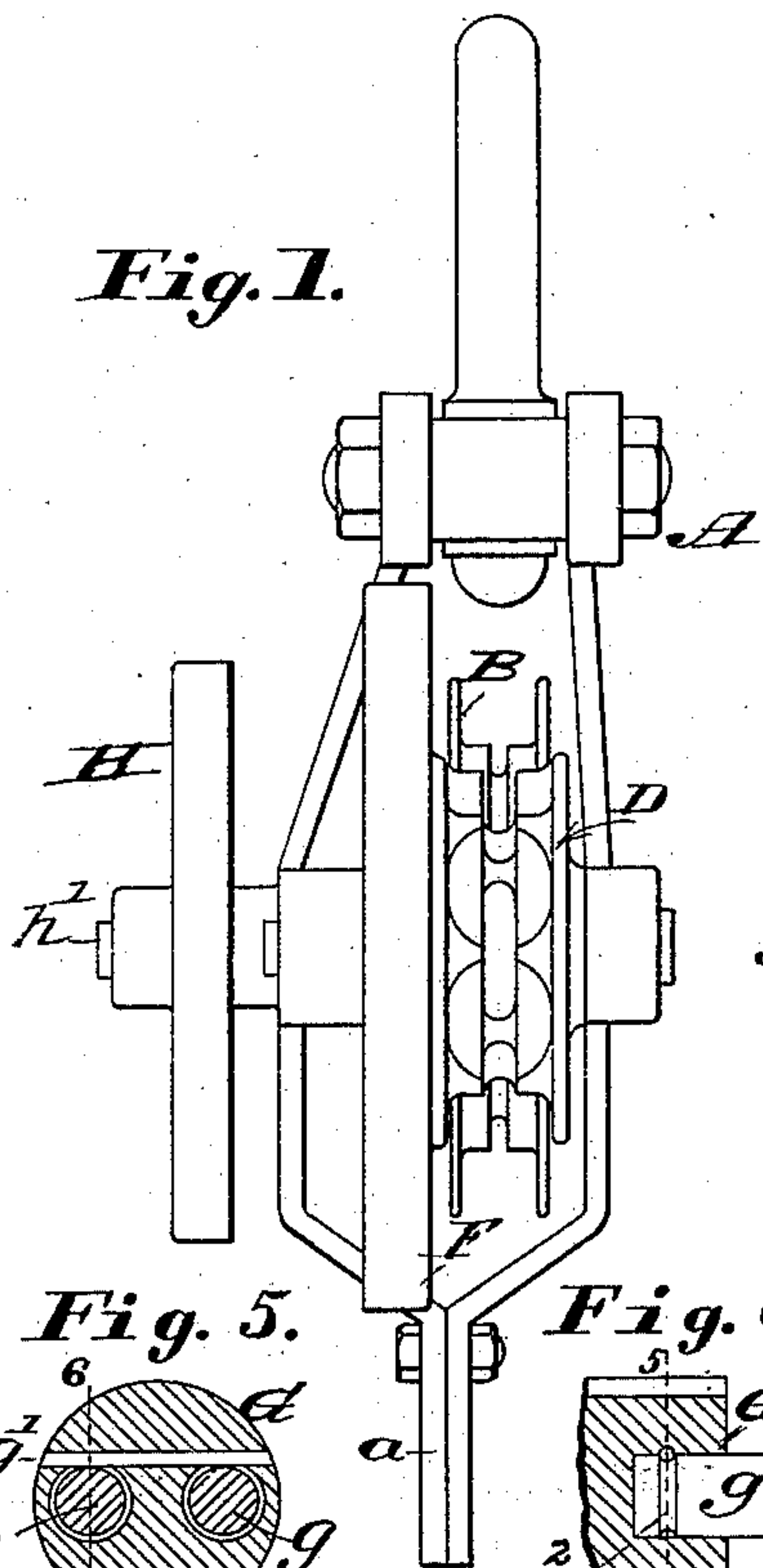
2 Sheets—Sheet 1.

F. SHICKLE.  
HOISTING BLOCK.

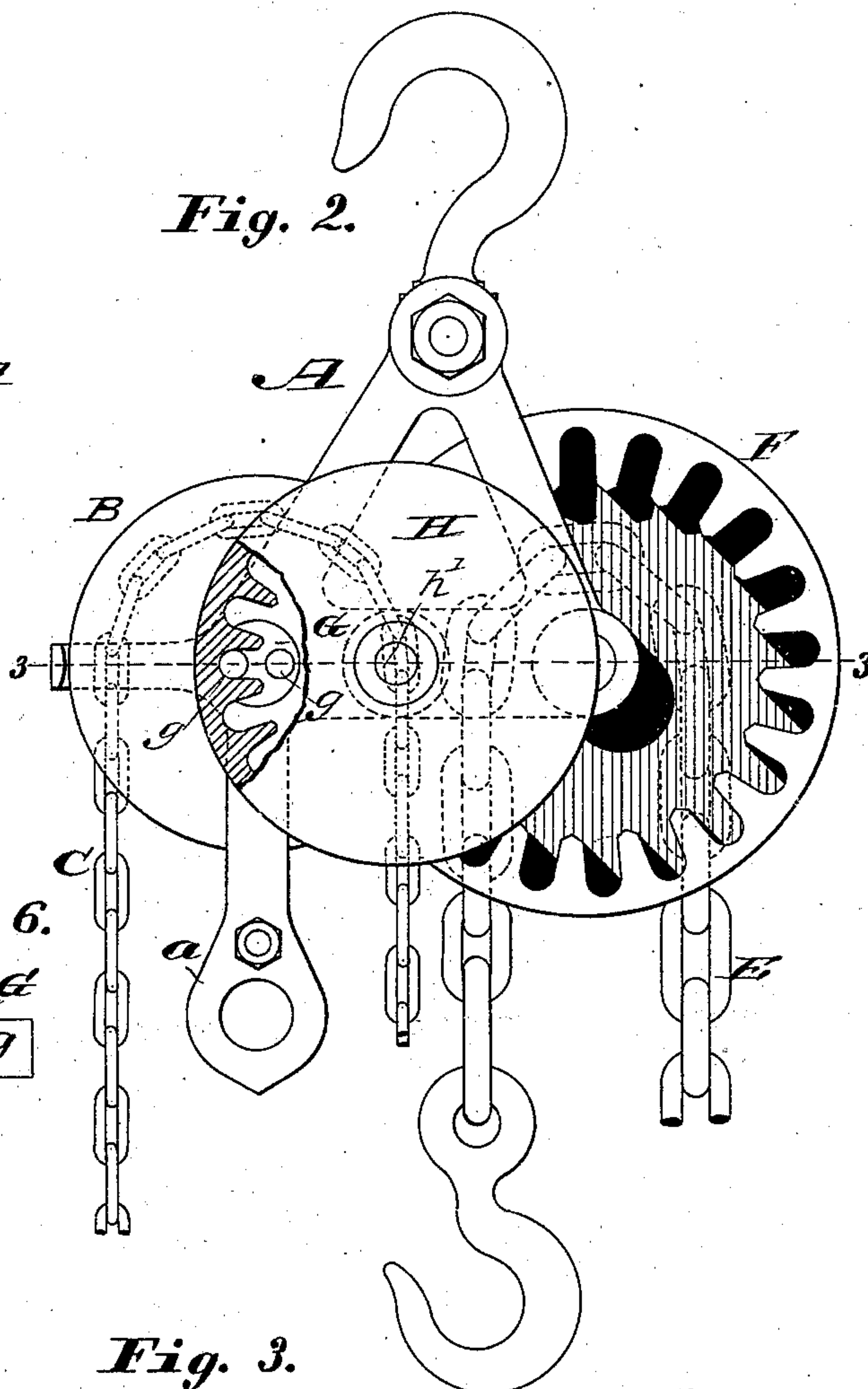
No. 312,663.

Patented Feb. 24, 1885.

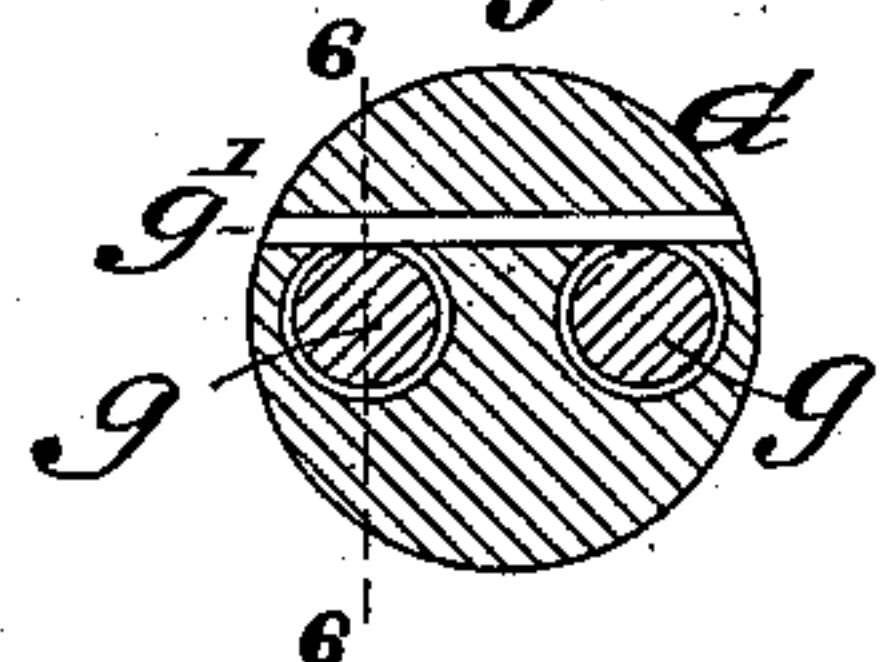
*Fig. 1.*



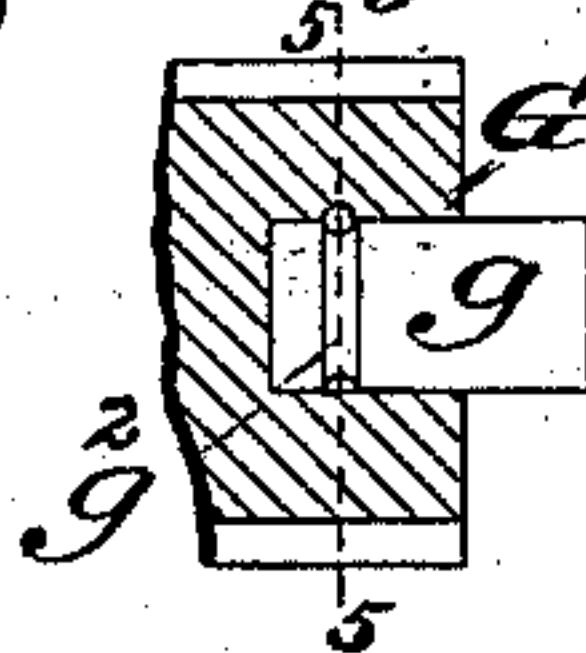
*Fig. 2.*



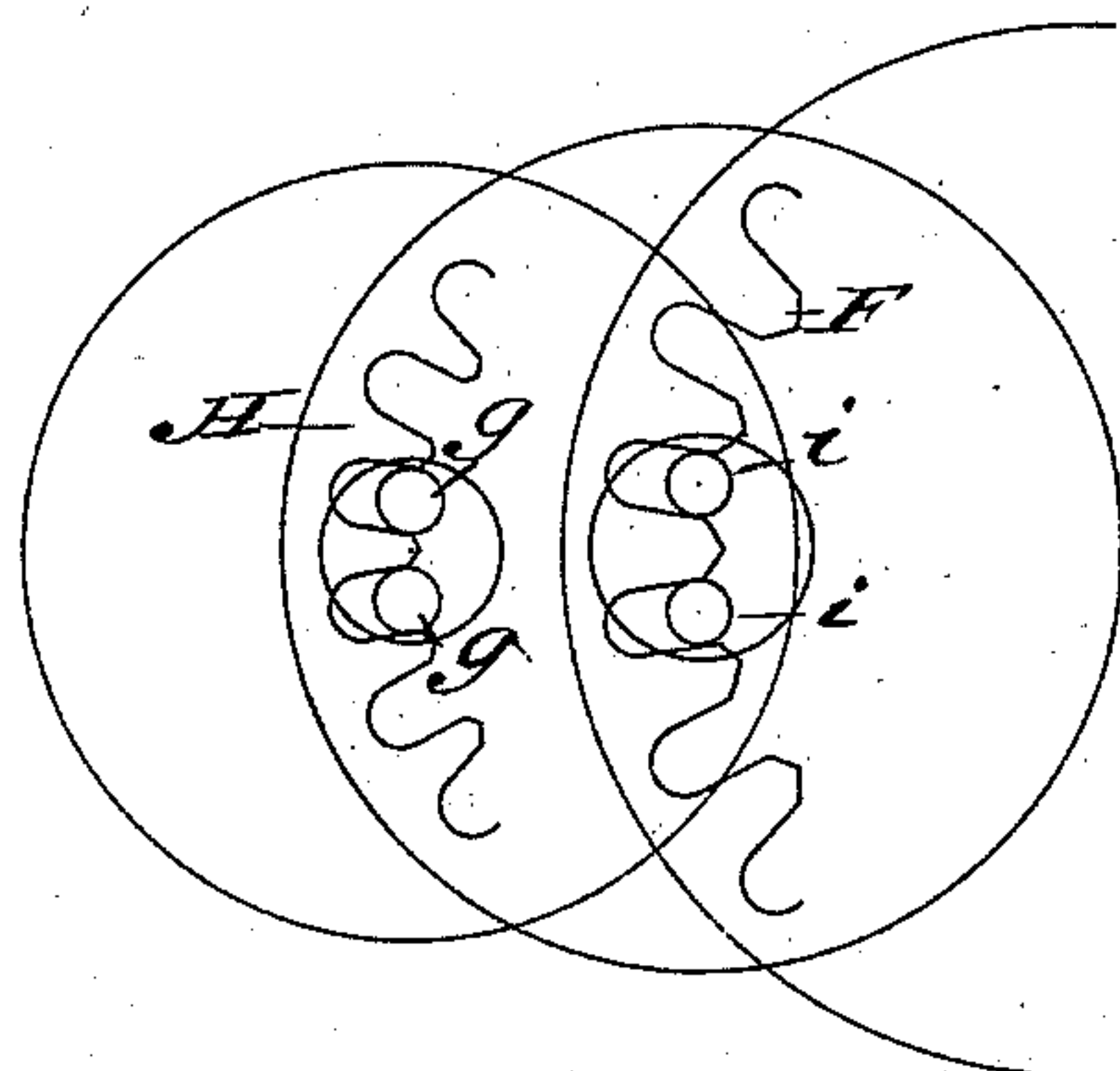
*Fig. 5.*



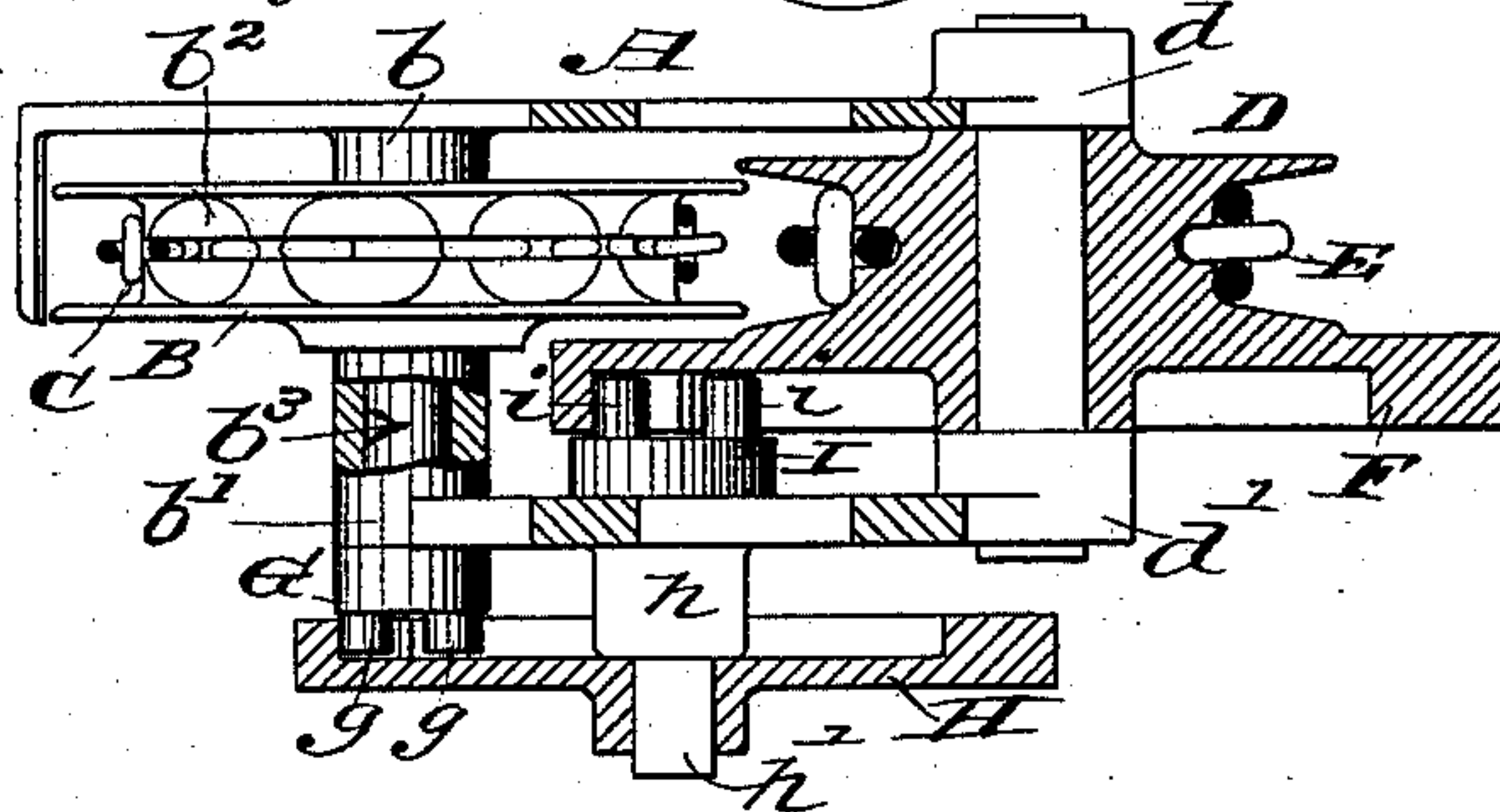
*Fig. 6.*



*Fig. 4.*



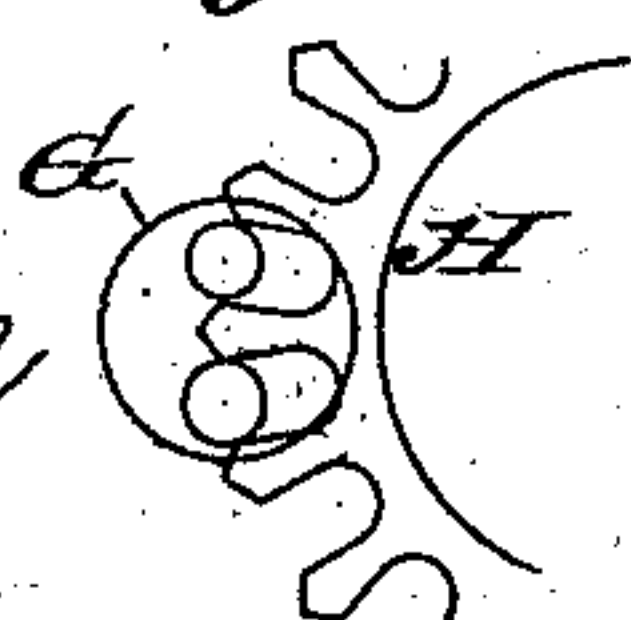
*Fig. 3.*



*Attest:*

*J. W. Hoke.*  
*Chas. F. Haanel*

*Fig. 7.*



*Inventor:*

*Frederick Shickle*  
*by C. D. Moody atty*

(No Model.)

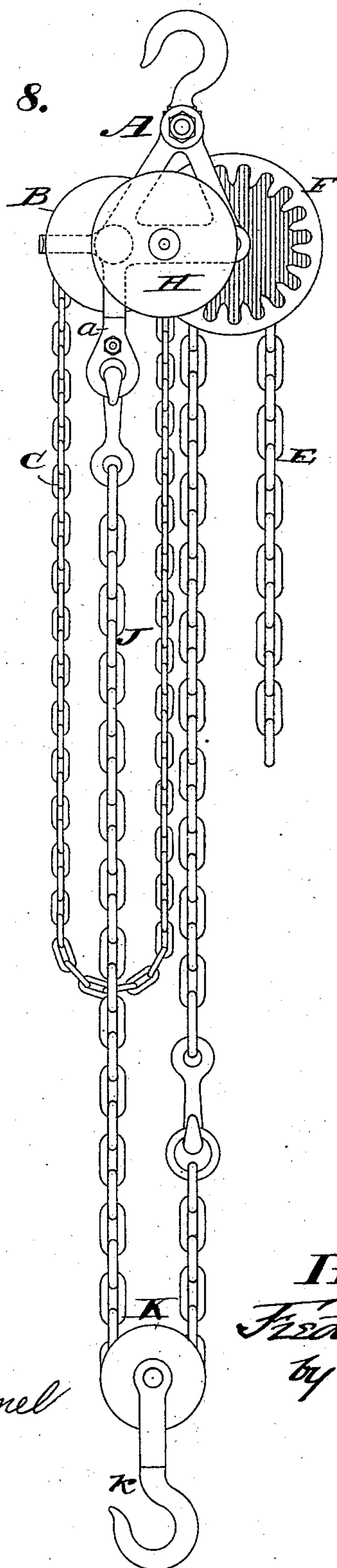
2 Sheets—Sheet 2.

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*Fig. 8.*



**Attest:**

*J. W. Hoke.*

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**Inventor:**

*Frederick Shickle*

*by C. P. Moody*

*att'y*



# UNITED STATES PATENT OFFICE.

FREDERICK SHICKLE, OF ST. LOUIS, MISSOURI.

## HOISTING-BLOCK.

SPECIFICATION forming part of Letters Patent No. 312,663, dated February 24, 1885.

Application filed August 4, 1884. (No model.)

*To all whom it may concern:*

Be it known that I, FREDERICK SHICKLE, of St. Louis, Missouri, have made a new and useful Improvement in Hoisting-Blocks, of which the following is a full, clear, and exact description, reference being had to the annexed drawings, making part of this specification, in which—

Figure 1 is an edge elevation of the improved hoisting-block; Fig. 2, a side elevation, a portion of one of the gears being broken away to exhibit the pinion in engagement therewith; Fig. 3, a horizontal section on the line 3 3 of Fig. 2; Fig. 4, a diagram used to illustrate the operation of the gears; Fig. 5, a section on the line 5 5 of Fig. 6; Fig. 6, a section on the line 6 6 of Fig. 5; Fig. 7, a diagram illustrating a modification of the gears, and Fig. 8 a side elevation showing a supplemental feature of the improvement.

The same letters of reference denote the same parts.

The present invention is an improvement in hoisting-blocks having power-multiplying gears.

The improvement relates partly to the construction of the gears and partly to the means for doubling the lifting-power.

A represents the frame of the block. It is of the customary form, saving as it is modified to suit the requirements of the improved features of the block.

B represents the sheave to which the power is applied. It is journaled in the frame at  $b$  and  $b'$ , and its face  $b^2$  is suitably constructed to receive the chain C, which passes over the sheave and engages therewith in the customary manner.

D represents the sheave over which the lifting-chain E passes. This sheave is journaled in the frame at  $d$   $d'$ , and the chain E engages with the sheave in the usual manner. The sheave D is provided with or is extended to form the gear F. The shaft  $b^3$  of the sheave B, beyond the bearing  $b'$ , is provided with or is extended to form a pinion, G. The noticeable feature of this pinion is its being made in the form of two pins,  $g$   $g$ , which project from the end of the shaft  $b^3$  on opposite sides of and parallel with the longitudinal axis of the shaft. The pinion-teeth  $g$   $g$ , which, as seen, are a half-

circle apart, are adapted to engage with the gear H. This last-named gear is journaled at  $h$  in the frame A, and on the inner side of the bearing  $h$  the shaft  $h'$  of the gear H is extended to form or is provided with a pinion, I, which in its construction is similar to the pinion G, the pinion I having the two pins  $i$   $i$ , which project on opposite sides and parallel with the longitudinal axis of the gear-shaft  $h'$ . These teeth  $i$   $i$  are adapted to engage with the gear F. The sheave B is fast upon its shaft  $b^3$ , and the gear H is fast upon its shaft  $h'$ . The operation of the device is then as follows: Power being applied to the chain C, the sheave B and pinion G are rotated in their bearings in the frame A. The pinion G drives the gear H and the pinion I, and the last-named pinion drives the gear F and sheave D, and the chain E is lifted. Now, owing to the fact that the teeth  $g$   $g$  are diametrically opposed upon the pinion G, the teeth, as indicated in the diagram of Fig. 4, are both at every half-revolution of the pinion directly in the pitch-line of the gear H. If, then, the gears are brought to a state of rest, when the teeth  $g$   $g$  are both thus in the pitch-line of the gear F the device becomes locked, for the weight being hoisted cannot exert in a backward direction any leverage upon the pinion G as long as both of its teeth are in the pitch-line, as described. In this manner the operator can, by slowing the movement of the lifting-chain so that the teeth  $g$   $g$  can be arrested in the position named, readily cause the weight to be suspended at any desired level. After the movement of the gears has been thus stopped and it is desired to renew it again, the operator draws on the chain C sufficiently to cause the teeth  $g$   $g$  to be moved out of the pitch-line of the gear H, whereupon the weight can be lifted or lowered, as desired, for by allowing the weight to be lowered at a sufficiently rapid rate the teeth  $g$   $g$  are kept from coming to a rest in the pitch-line. The pinions G and I are preferably adjusted to work together—that is, when the teeth  $g$   $g$  are in the pitch-line of the gear H, the teeth  $i$   $i$  are in the pitch-line of the gear F, as indicated in the diagram of Fig. 4. To diminish the friction with the gear H the pins  $g$   $g$  are preferably held loosely in the shaft  $b^3$ ,



so that they can rotate therein as they operate upon the teeth of the gear H. A cross-pin,  $g'$ , Fig. 5, which passes transversely through the shaft  $b^3$ , and so as to engage in a groove,  $g^2$ , in the pins  $g$   $g$ , prevents the pins from slipping out of their bearings in the shaft  $b^3$ . The teeth  $i$   $i$  of the pinion I are similarly held in the shaft  $h'$ . The gears H F are preferably made internal, as shown; but, if desired, the gears H F may, either or both, have their teeth arranged upon the outer side of their faces, and the pinions G I be made to engage there-with accordingly, as indicated in the diagram of Fig. 7. The gear-teeth, however, are not, from having to be made narrower at the neck, as strong as when made on the inner side of the gear-face. At times it is desirable to be able to exert a greater lifting-power. To this end the frame A is provided with a part, such as the eye  $a$ , Figs. 1, 2, 8, which extends downward, or so that a chain, J, Fig. 8, can be attached thereto and lead thence to and connect with the chain E. A pulley, K, is hung upon the connected chains E J, and the weight to be lifted is attached to the pulley K by means of the hook  $k$ . The chain E now is worked over the sheave D, as before, but only half as fast, and the lifting-power of the block is doubled. If the chain E is long enough, it may be adjusted to take the place of the chain J.

The combination of the pinion G, constructed as herein described, with the internal gear, H, is useful in other forms of mechanism than

hoisting-blocks; and I do not desire to be limited to hoisting-blocks in its application.

I claim—

1. In combination, substantially as described, the frame A, the sheaves B D, the chains C E, the pinions G I, and the gears H F.
2. In combination, substantially as described, the frame A, having the eye  $a$ , the sheaves B D, the chains C E, the pinions G I, and the gears H F.
3. The combination, in a hoisting-block, of the frame A, the sheave B, the shaft  $b^3$ , having the pinion G, constructed as described, and the gear H, substantially as set forth.
4. The combination of the shaft  $b^3$ , having the teeth  $g$   $g$ , arranged as described, and the gear H, substantially as described.
5. The combination of the shaft  $b^3$ , having the teeth  $g$   $g$ , arranged and held loosely in the shaft, as described, with the gear H, substantially as described.
6. In a hoisting-block, the combination of the frame A, having the eye  $a$ , with the sheave D and chain E, substantially as described.
7. The combination of the pinion G, constructed with the two pins  $g$   $g$ , as described, with the internal gear, H, substantially as described.

Witness my hand.

FREDERICK SHICKLE.

Witnesses:

C. D. MOODY,

J. W. HOKE.