(No Model.) 4 Sheets—Sheet 1.

T. W. CAPEN.

TRAVELING CRANE.

No. 263,479. Patented Aug. 29, 1882.

Fig. 1.

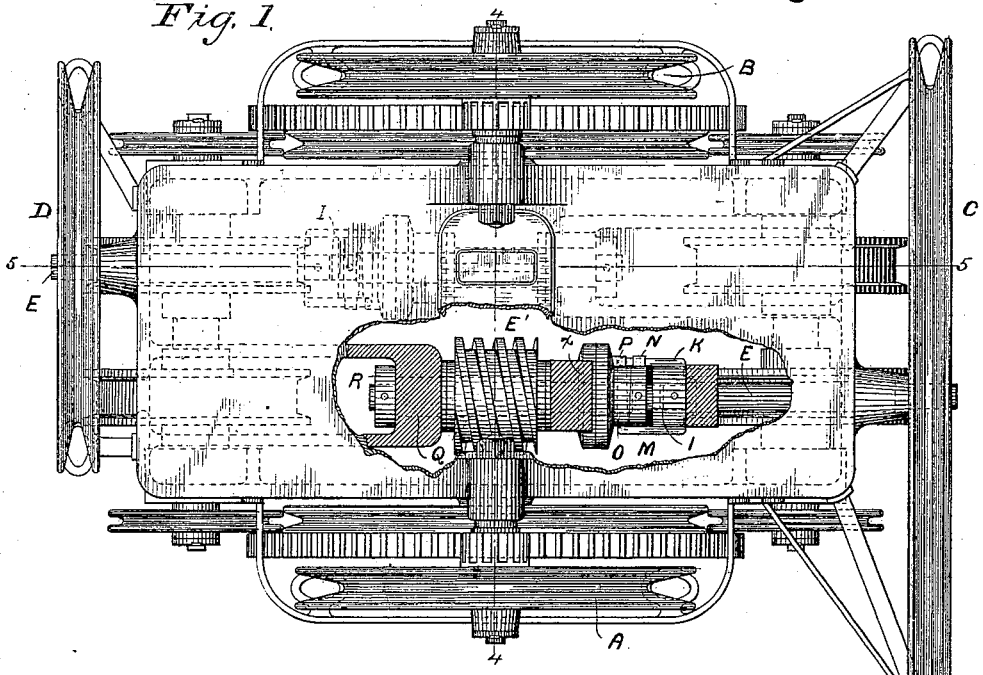
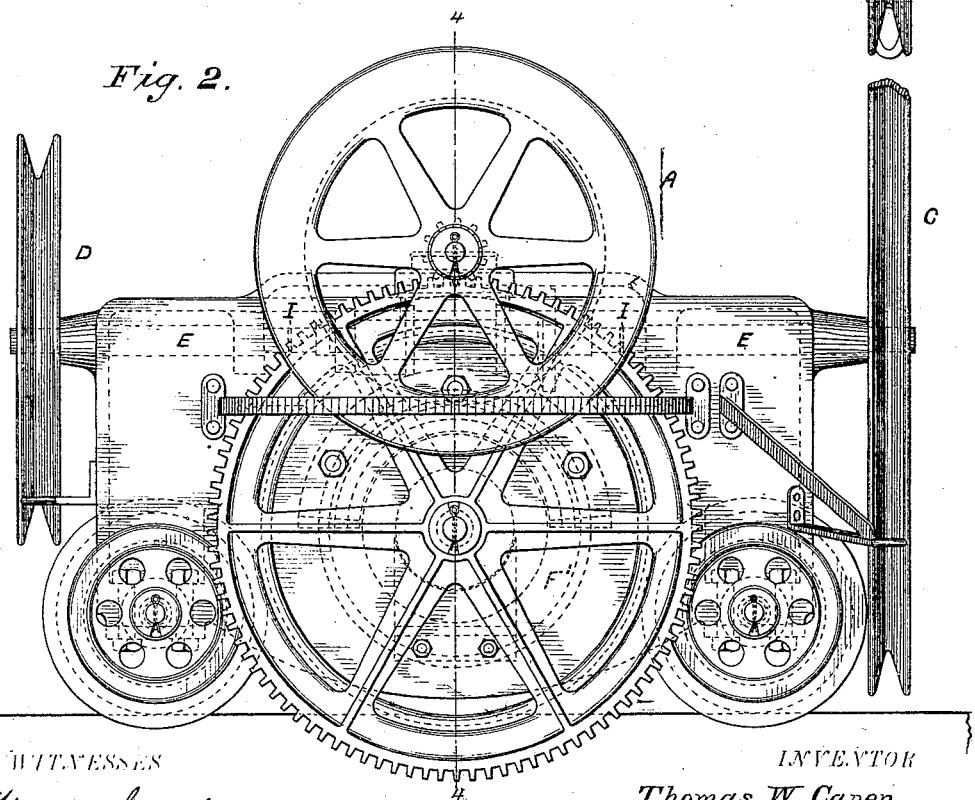


Fig. 2.



WITNESSES

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Fig. 4.

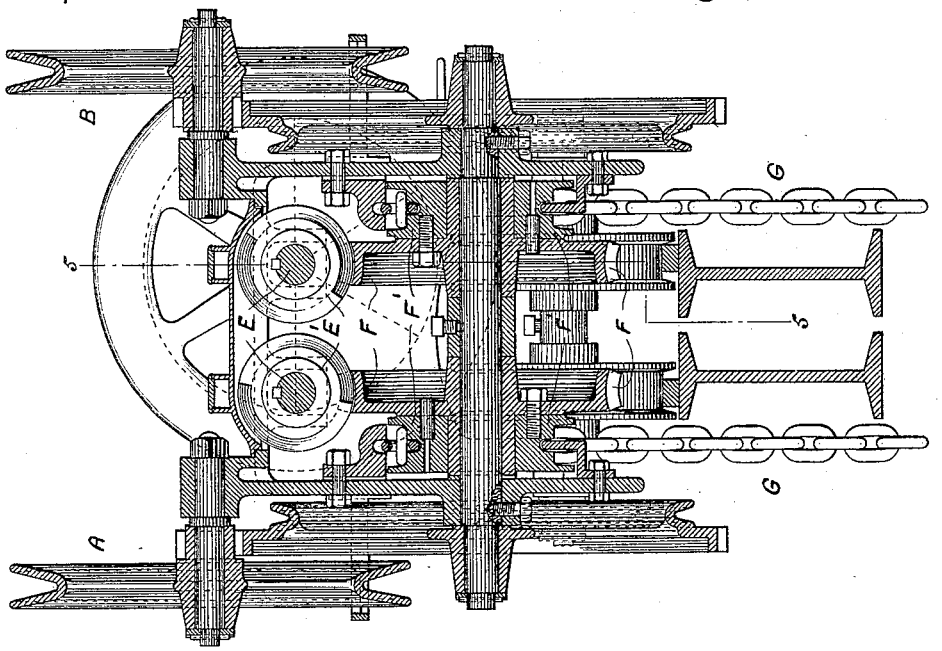

Fig. 3.

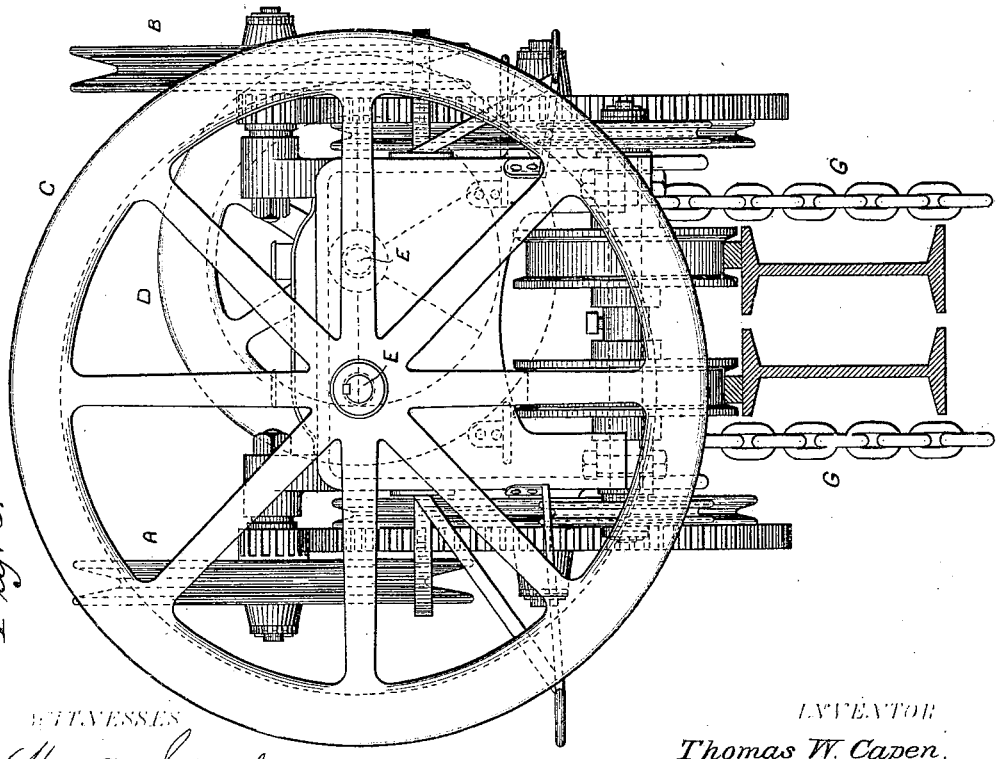

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Fig. 5.

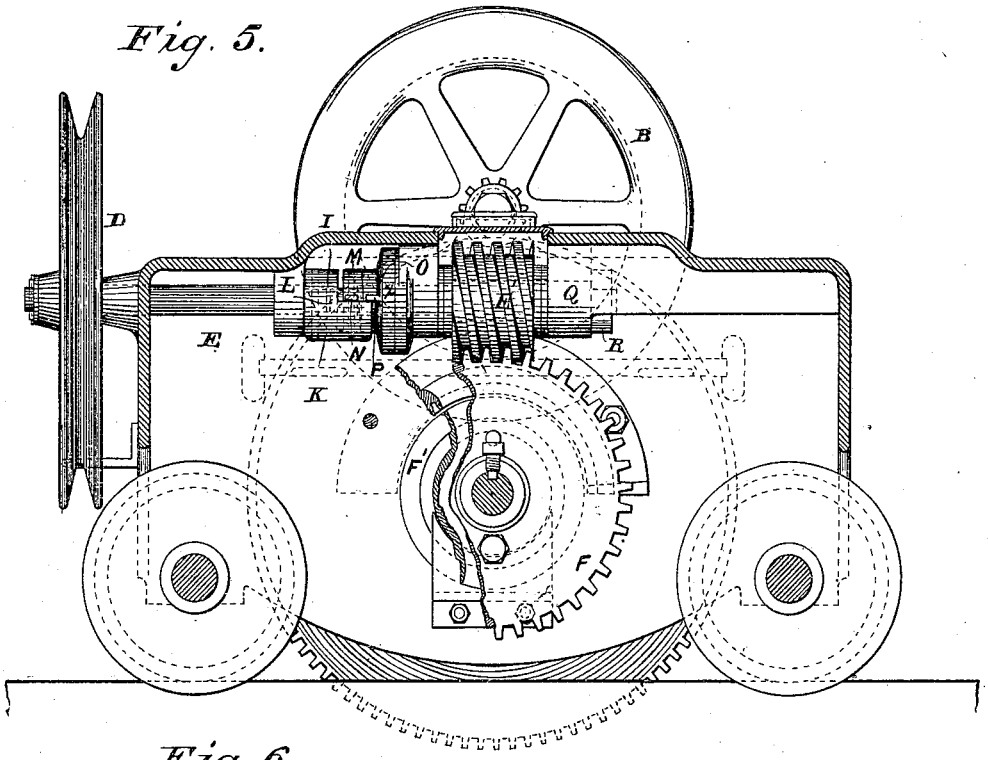


Fig. 6.

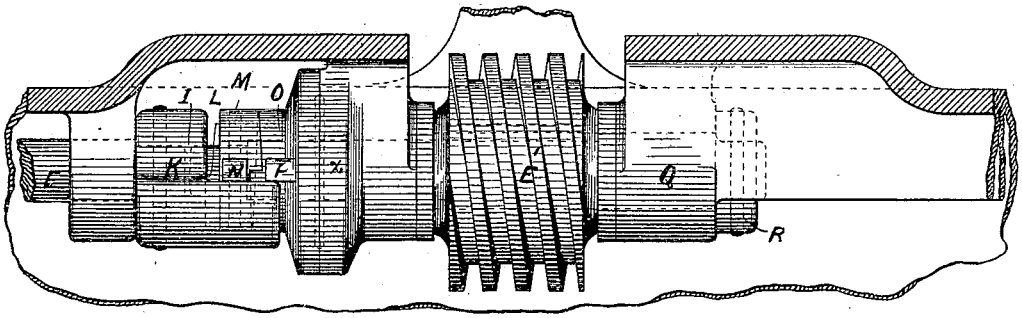
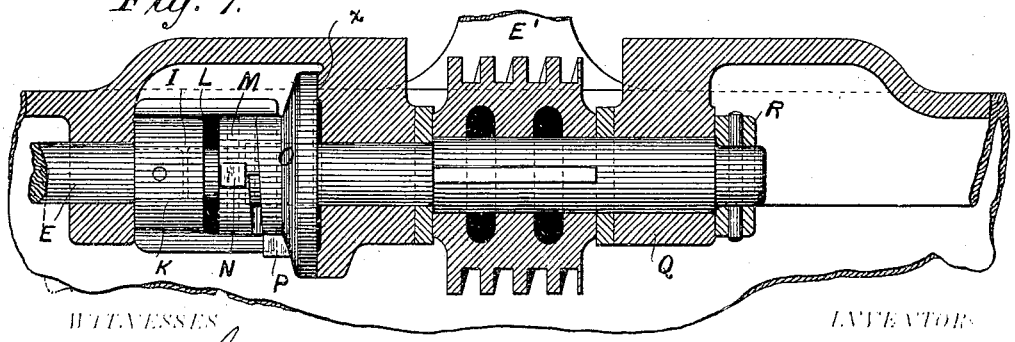


Fig. 7.



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(No Model.)

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T. W. CAPEN.

TRAVELING CRANE.

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Fig. 8.

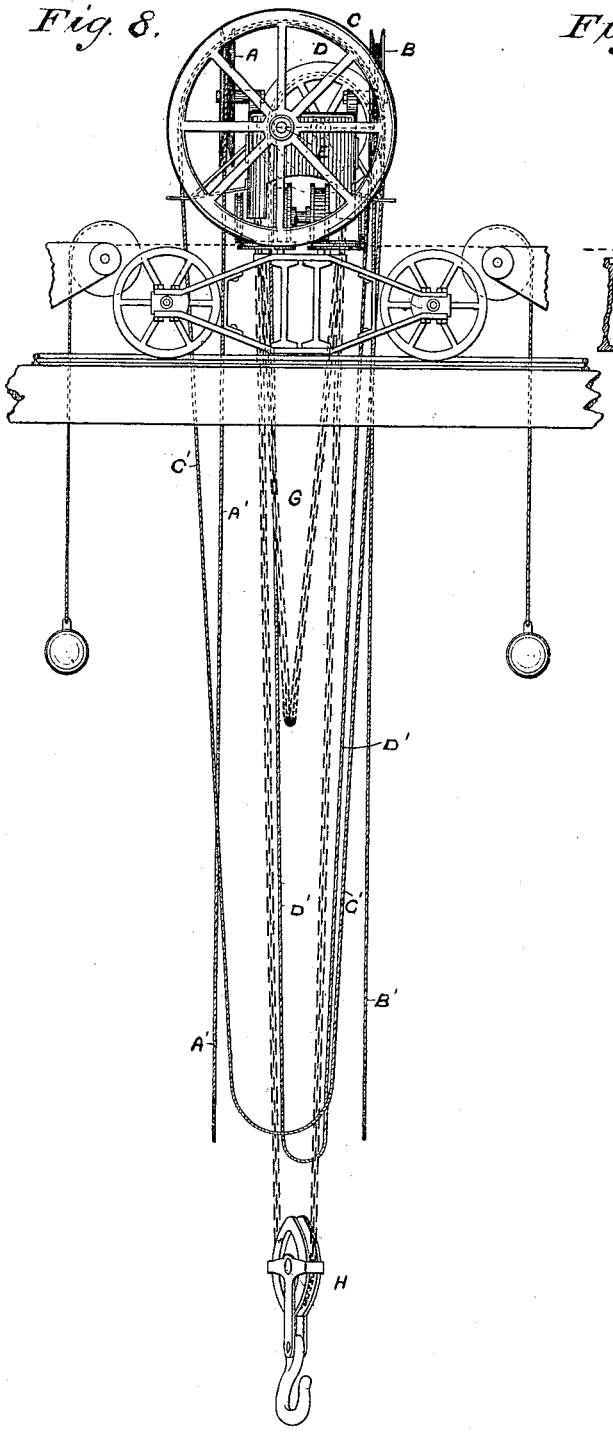
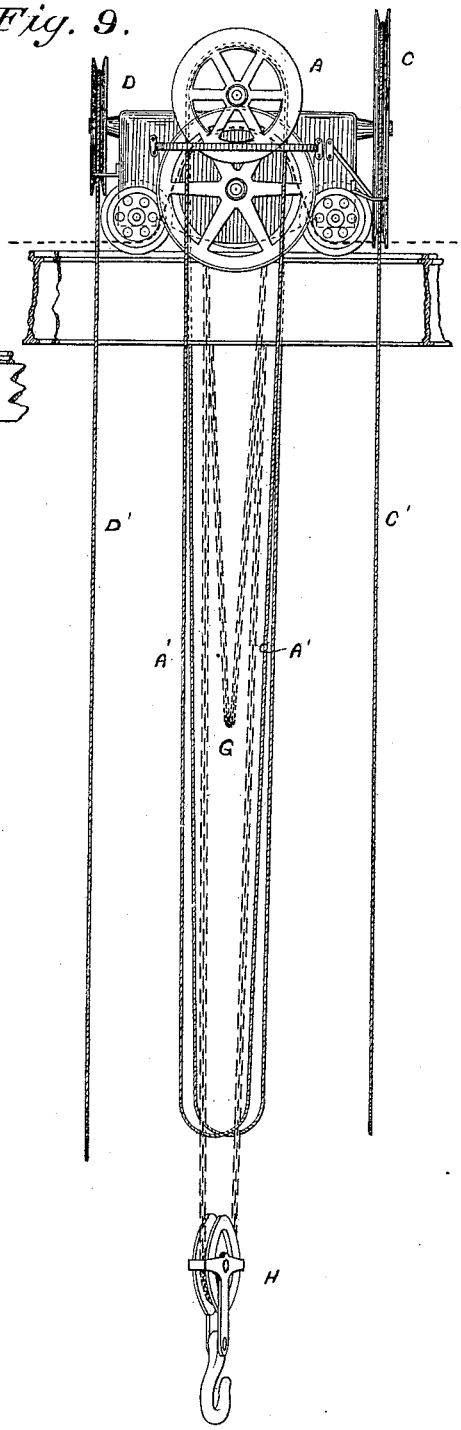


Fig. 9.



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UNITED STATES PATENT OFFICE.

THOMAS W. CAPEN, OF STAMFORD, CONNECTICUT, ASSIGNOR TO THE YALE LOCK MANUFACTURING COMPANY, OF SAME PLACE.

TRAVELING CRANE.

SPECIFICATION forming part of Letters Patent No. 263,479, dated August 29, 1882.

Application filed July 20, 1882. (No model.)

To all whom it may concern:

Be it known that I, THOMAS W. CAPEN, of Stamford, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Traveling Cranes, of which the following is a specification.

The object of my invention is to improve the construction and organization of parts of the crab of a traveling crane of the kind set forth in the United States Patent of Thomas A. Weston, No. 198,718, granted December 25, 1877, and to provide an automatic brake to prevent the running down of the load, which may be applicable also in connection with other hoisting-machines, especially where a worm and worm-wheel are employed.

In the accompanying drawings, Figure 1 is a top view of the crab, partly broken away. Fig. 2 is a side view of the same. Fig. 3 is an end view. Fig. 4 is a central vertical section on the line 4 4 of Figs. 1 and 2. Fig. 5 is a central view on the line 5 5 of Figs. 1 and 4. Fig. 6 is a side view of one of the shafts and worms detached, showing the casing in section. Fig. 7 is a central longitudinal section of the same. Fig. 8 is an end elevation of the crab resting upon its bridge, showing a portion of one of the tracks which support the bridge and the pending pull-chains and hoisting-chains; and Fig. 9 is a side elevation of the crab and pending chains, showing a portion of the bridge.

A indicates a traversing hand-wheel, and A′ its pull chain or rope. B indicates another traversing hand-wheel, and B′ its pull chain or rope. Fixed cables and their sheaves are partially shown in Figs. 8 and 9. Pulling upon one side of these pull-chains will cause the crab to travel in one direction upon the bridge, and pulling on the other side of these chains will cause the crab to travel in the opposite direction on the bridge. By pulling diagonally opposite sides of these chains the bridge is caused to travel in one direction on its tracks, and by pulling the opposite diagonal sides of the chains the bridge is caused to travel in the opposite direction on its tracks. By pulling on one side of one of these opposite chains, while the other chain remains at rest, the crab and bridge will both move, giving a diagonal motion to the load in one direction, and by pulling on the other side of the chain the crab and bridge will both move, causing an opposite diagonal movement of the load. Thus by means of these traversing hand-wheels and pending pull-chains and the two intersecting fixed cables and their sheaves, described in the said patent of Thomas A. Weston, the crab and bridge are moved separately in either direction, the crab on its bridge and the bridge on its tracks; or both crab and bridge may be moved simultaneously in either direction, giving a diagonal resultant motion to the load, whereby the load may be placed by the operator at will in any desired position within the area bounded by the two tracks which support the bridge. I claim nothing, however, with respect to these movements and this result, but simply refer to them and to the said patent of Thomas A. Weston, where they are fully described, by way of making my improvements clearly understood by reference to operating parts in connection with which they are employed and with which they are organized.

C indicates a large hand-wheel operated by means of the pull chain or rope C′, and D a small hand-wheel operated by means of the pull chain or rope D′. Each of these hand-wheels is secured to a shaft, E, on the inner end of which is a worm, E′, beyond which is the inner housing of the shaft. Each worm engages with a worm-wheel, F, which is rigidly connected with a chain-wheel, F′. The endless hoisting-chain G passes down on one side of one of the pocketed chain-wheels and up on the other side of the other, forming two loops, one for the slack and the other for the block H, which hangs in a diagonal position.

From the foregoing it will be seen that by rotating either of the hand-wheels the corresponding chain-wheel will raise or lower one part of the hoisting-chain and lift or lower the load, the chain being pocketed in its wheels, so that it cannot slip. The different diameters of these hand-wheels, when used alone, give two different speeds for hoisting and lowering, the small wheel and its pull-chain being used for light weights and quick speeds and the

large wheel and its pull-chain for heavy weights and slow speeds. Pulling upon one side of either of these chains lowers the load and pulling upon the other side raises it. Pulling upon corresponding sides of both chains at the same time will give the sum of the speeds of both, either for raising or lowering the load. Pulling upon opposite sides of both at the same time will give a differential resultant speed, either for raising or lowering the load. Thus four different speeds of either raising or lowering the load are obtainable.

Referring to the automatic brake, it will be seen that each worm-shaft E is divided into two parts at I for the purpose of applying the brake. To the exterior part, or that to which the hand-wheel is secured, is rigidly attached a driver, K. This driver, as shown enlarged in Figs. 6 and 7, consists of a hollow cylinder, with a half-cylindrical section cut away from the point L to its inner end; but its form may be modified. To the extension or inner part of the shaft is rigidly attached a collar, M, which has a projecting lug, N. Next to this collar is a loose collar, O, provided with a projecting lug, P. The extreme inner end of the shaft is provided with a bearing, Q, and is prevented from longitudinal motion outward by the fixed collar R or otherwise. The adjacent faces of the fixed collar M and the loose collar O are inclined, as illustrated. Only a single incline is shown; but the incline might be double—that is to say, there might be two inclines in opposite directions.

The operation of this brake mechanism is as follows: When the outer part of the shaft is revolved the driver K turns around until it picks up the collars M and O by means of the lugs N and P, which are in such position that the inclined adjacent faces of the collars fit together, so as to make collars M and O practically one piece when the lugs are in operation. The result is that both parts of the shaft turn freely, the worm is revolved, and the worm-wheel is rotated. Motion in the contrary direction will produce a similar effect, the lugs engaging on opposite sides. Now, the load can only run down by turning the inner part of the shaft through the force of the load applied to the chain-wheel and communicated to the worm-wheel and worm. As soon as motion from such a cause takes place the fixed collar M will begin to turn; but there will be nothing to turn the loose collar O. The result will be that the inclines will begin to climb up one on the other, which will make a pinch between the collars M and R, because the climbing of the inclines will cause the collar M to push inward on the collar O and force it against the end of the shaft-bearing at *x*. The farther the worm turns the harder this push will be until friction brings everything to a stop. The collar O is made of greater diameter on one side than on the other, so that any slipping that takes place will take place on the incline and cause the climbing and pinching above described. With a single incline this action will only take place when the worm is turned in one direction; but with a double incline any motion proceeding from the worm would be arrested by the brake at once. Of course in a crane the motion would only be from the running down of the load; but there are some cases where there will be a hook at either end of the chain, and in such cases a double incline may be used, being only a duplicate in principle and construction of that illustrated, and therefore not necessary to be further explained. Thus I provide that any motion of the shaft in either direction, produced by the hand-wheel, will lift or lower the load, and any motion of the inner part of the shaft, produced by running down of the load, will immediately cause a strain against the ends of the inner shaft-bearings, such as easily to resist the rotation of the shaft caused by the load, or by any force operating primarily upon the inner end of the shaft instead of the outer end.

Having thus described my improvements, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination of the two hand-wheels C and D and their pull-chains with the worms, worm-wheels, chain-wheels, and hoisting-chain, whereby four different speeds of hoisting and of lowering may be obtained, substantially as set forth.

2. In a crab for a traveling crane, the combination of worm-wheel hoisting mechanisms and traversing mechanism, substantially as set forth.

3. The combination of the two parts of the shaft E with the driver and the fixed collar M and loose collar O, adapted to be engaged by the driver to turn the shaft in either direction, substantially as set forth.

4. The combination of the two parts of the shaft E with the driver and the fixed and loose collars M and O, adapted to be engaged by the driver to turn the shaft, the adjacent faces of the collars being inclined, as set forth, and the part of the shaft carrying the collars being held against longitudinal motion, substantially as set forth.

5. The combination of the shaft and the fixed and loose collars M and O, having inclined adjacent faces, and so constructed and arranged that the loose collar is wedged against a firm stop in operation and the shaft is held against longitudinal movement, whereby a brake is applied to stop its rotation, substantially as set forth.

In testimony whereof I have hereunto subscribed my name.

THOMAS W. CAPEN.

Witnesses:
H. S. McCONKEY,
SCHUYLER MERRITT.