No. 745,480. PATENTED DEC. 1, 1903.

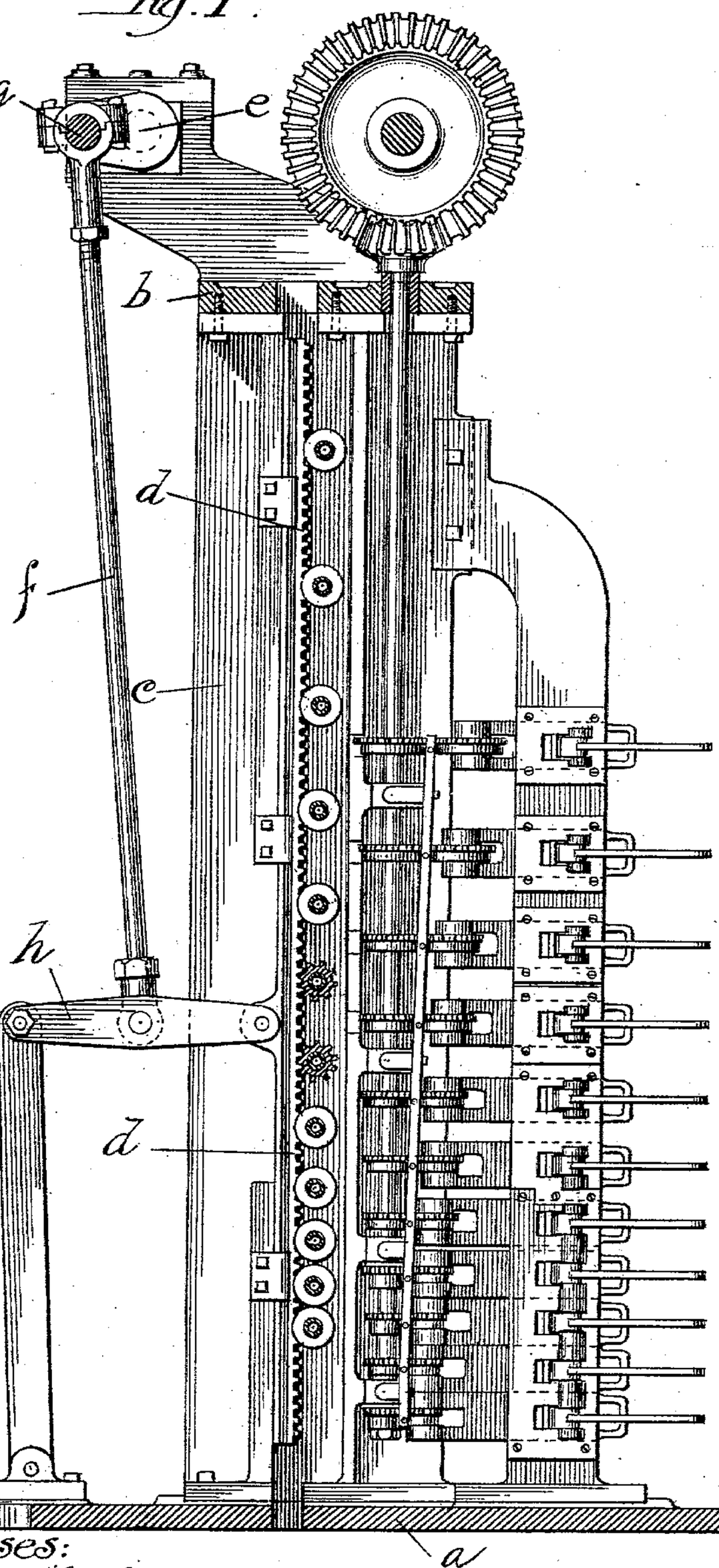
J. A. COCKER.

WIRE FENCE MACHINE.

APPLICATION FILED DEC. 11, 1902.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 1.

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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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NO MODEL. 2 SHEETS—SHEET 2.

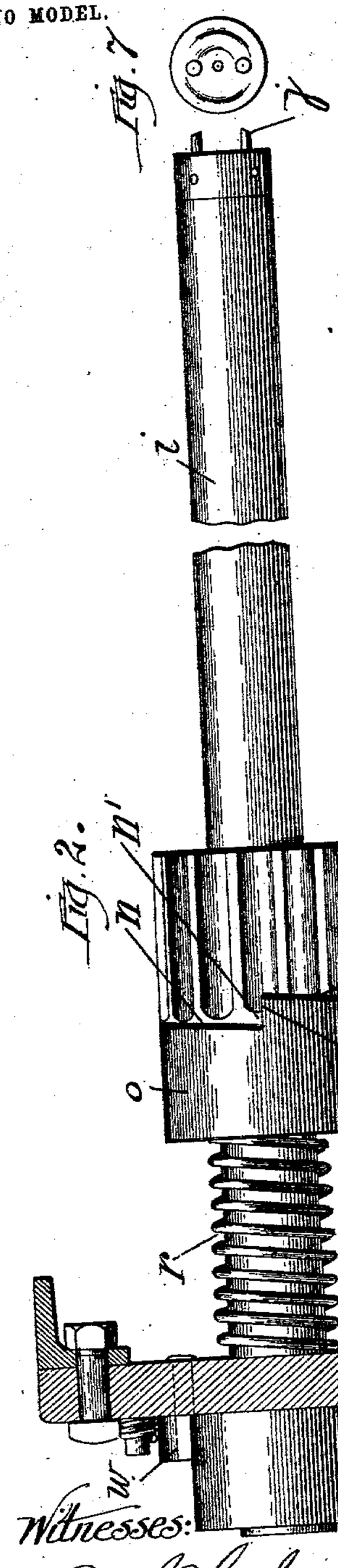

Fig. 2.

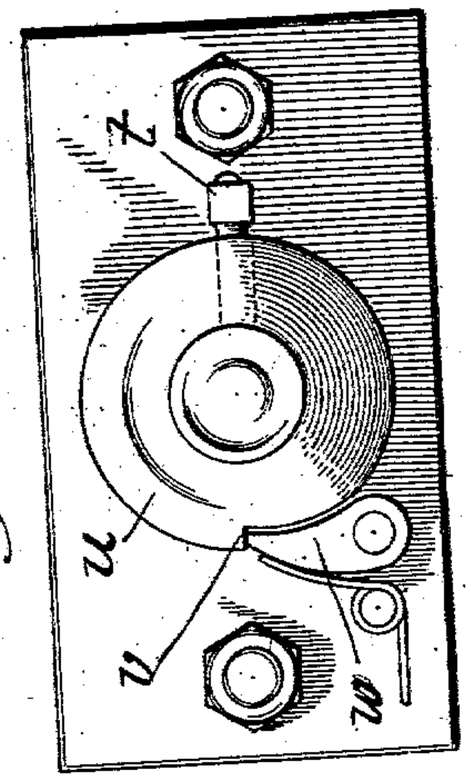

Fig. 4.

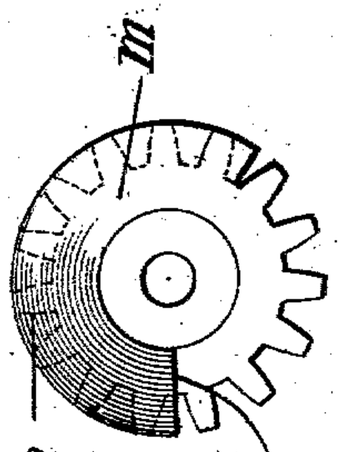

Fig. 6.



Fig. 5.

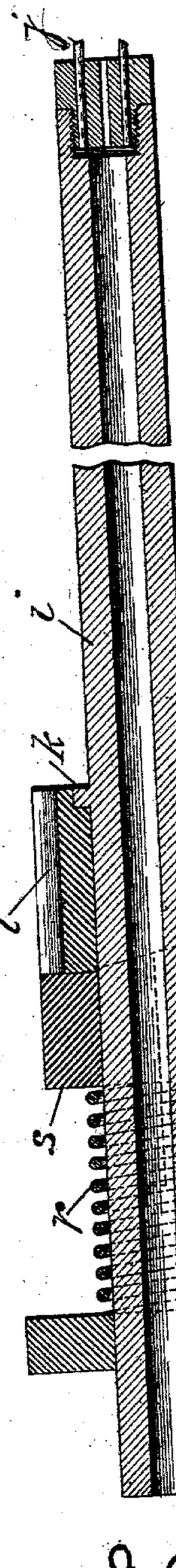

Fig. 3.

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No. 745,480. Patented December 1, 1903.

# UNITED STATES PATENT OFFICE.

JOHN ARTHUR COCKER, OF JOLIET, ILLINOIS, ASSIGNOR TO THE AMERICAN STEEL & WIRE COMPANY, OF NEW JERSEY, A CORPORATION OF NEW JERSEY.

## WIRE-FENCE MACHINE.

SPECIFICATION forming part of Letters Patent No. 745,480, dated December 1, 1903.

Application filed December 11, 1902. Serial No. 134,845. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN ARTHUR COCKER, a citizen of the United States, residing at Joliet, county of Will, State of Illinois, have invented certain new and useful Improvements in Wire-Fence Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The present invention has for its particular object to improve the construction of the coiler and coiler-operating mechanism illustrated, described, and claimed in the patents granted to A. J. Bates, February 23, 1897, No. 577,639, and October 19, 1897, No. 591,996, for machines for making wire fencing. In the machines of these patents the coilers are arranged one above another in a vertical tier and all are operated simultaneously by a toothed rack-bar or gear-rack. The coilers are provided with driving-pinions fixed on their spindles, and with these pinions the gear-rack engages, so that the coilers are revolved at intervals by the reciprocation of the rack. The rotation of the coilers is always in one direction, and as the rack is reciprocated it is necessarily disengaged from the coiler-pinions during one part of its throw.

In the present instance the coilers are operated at intervals in one direction, the same as in the former patents, and the rotation is effected by substantially the same gear-rack; but instead of intermittently disconnecting the rack from the pinions, as before, they are permanently in mesh therewith, and the pinions are so connected with the coiler-spindles that they turn backward and revolve loosely on the spindles while the rack is moving in one direction, but become locked to the spindles and cause them to rotate when the rack moves in the opposite direction. Thus although the same reciprocating rack is employed the mechanism for moving it into and out of mesh with the coiler-pinions is entirely dispensed with, besides which noiseless, easier, and prompter operation of the coilers at a higher rate of speed is secured.

The invention is illustrated in the accompanying drawings, wherein—

Figure 1 is an end elevation of the machine, partly in section, showing the general arrangement of the coilers and gear-rack. Fig. 2 is a horizontal section through the vertical frame-bar in which the coilers have their bearings and showing in plan one of the complete coilers on a larger scale. Fig. 3 is a central longitudinal section of the coiler. Fig. 4 is a side view of a part of the frame-bar, showing the arrangement for preventing reverse movement of the coiler-spindle on the return or inoperative stroke of the rack. Fig. 5 is an end view of the clutch-collar of the spindle, showing the face which engages the driving-pinion. Fig. 6 is a similar view of this pinion, showing its clutch-face; and Fig. 7 is an outer end view of the coiler-spindle.

Referring to the views, *a* denotes the base, and *b* the top plate, of the machine, with a vertical frame-bar *c* extending from one to the other. In this bar the coilers are journaled in vertical series one over another, as in the patents above referred to. The coilers are all operated simultaneously by the gear-rack *d*, which slides vertically along the frame-bar in suitable keepers, the reciprocating movement of the rack being obtained from an overhead shaft *e* through the intermediacy of a pitman *f*, which is connected to a crank *g* of the shaft at its upper end and is pivoted at its opposite end to a short lever-arm *h*, that makes connection with the rack-bar, so that as the shaft rotates the arm will be vibrated and the gear-rack will be reciprocated in substantially the same way as in the former patents. The coilers have tubular spindles *i*, and the strand-wires pass through them in the usual way. At their outer ends they are also provided with pins *j*, as usual, to engage the stay-wires and wrap them around the strand-wires, and the operation of the coilers upon the strand and stay wires is precisely the same as in the patents above referred to.

The spindles *i* of the coilers are provided at a point about one-third of their length from their bearing with a flange *k*, and the coiler-driving pinion *l* is loosely journaled or sleeved on the cylindrical shank of the spindle immediately adjacent to this flange, this

face of the pinion being preferably rabbeted to receive the flange. The opposite end of the pinion (the one toward the frame-bar) is provided with a rim or face *m*, having a spiral surface *n* and a square shoulder *n'* connecting the ends of the spiral, thus forming a ratchet-toothed surface, which obviously may be modified in construction, provided the essential feature or the ratchet-face—viz., that of slipping in one direction and holding in the other—be retained. Between the pinion and its bearing in the frame-bar *c* the spindle is provided with a collar *o*, which is connected thereto by a spline or feather *p*, so that it may slide on the spindle, but will always turn with it or be turned by it. This collar is provided on the end adjacent to the pinion with a spiral surface *q* and a square shoulder *q'*, precisely like the corresponding parts on the face of the pinion *l*, so as to engage with the inner end of the pinion like the two halves of a clutch. The pinion, it will be understood, is permanently in mesh with the gear-rack, but being free to turn in either direction on the spindle it would not of itself effect any revolution of the coiler. Being connected to the collar *o*, however, by the engagement of the two ratchet-toothed clutch-faces *n q*, the spindle is turned whenever the pinion is rotated in the proper direction to bring the two square shoulders *n' q'* into engagement with each other; but when the pinion is rotated in the opposite direction, so that the shoulders or teeth *n' q'* are separated, the spiral surfaces *n* and *q* of the pinion and collar simply slip or ride over each other, the collar moving away from the pinion by virtue of its sliding connection with the shank of the spindle. No rotation of the spindle whatever is therefore obtained when the pinion is moving in this direction.

In order to hold the collar *o* yieldingly up to the pinion *l*, so as to permit it to move away from the pinion, as thus described, and also to cause it to move toward the pinion, so as to insure the engagement of the clutch-teeth *n' q'*, there is provided a spring *r*, that is coiled around the shank of the spindle and reacts between the frame-bar and the plain end *s* of the collar. The effect of this arrangement is to hold the pinion and collar normally in locked engagement with each other, so that the revolution of the pinion in one direction only is imparted to the spindle through the intermediacy of the collar, the pinion being allowed to revolve freely in the opposite direction without turning the spindle or the collar.

It is desirable to provide the spindle with a ratchet-lock to prevent the friction between the clutch-faces of the pinion and the collar from giving it any backward movement whatever, and I therefore secure by a set-screw *t* or other convenient means to the rear end of the spindle, behind the frame-bar, a flange *u*, having a notch *v* at one point in its periphery, and a spring-actuated pawl *w* is pivoted to the frame-bar in position to have its free end engage the notch and prevent any movement in a backward direction.

The construction of my improved coiler-operating mechanism being as thus described, it is believed the operation will be understood without further explanation. The gear-rack is permanently engaged with the pinions, as illustrated in Fig. 1, and as it is reciprocated the pinions are rotated back and forth. As they turn forward the square shoulders *n' q'*, which are in reality the ratchet-teeth of a two-part clutch, engage each other and the collar is turned, and with it the spindle. When, however, the reverse rotation of the pinion occurs, the spring allows the spiral surfaces of the collar and pinion to ride up and over each other, and as the pawl *w* prevents the spindle from turning backward the pinion simply rotates backward without producing any motion of the spindle and only a slight endwise-sliding motion of the collar.

Having thus described my invention, what I claim, and desire to secure, is—

1. The combination of a wire-coiling spindle, a driving-pinion loose on the spindle and having a ratchet-toothed clutch-face, a collar splined to the spindle and having a similar clutch-face, a spring to hold the clutch-face of the collar yieldingly engaged with that of the pinion, and means for preventing the backward rotation of the spindle when the pinion rotates backward.

2. The combination of a wire-coiling spindle, having a bearing in a frame-bar, a driving-pinion loose on the spindle and having a ratchet-toothed clutch-face, a collar splined to the spindle and having a similar clutch-face, a spring reacting between the collar and the frame-bar to hold the clutch-face of the collar yieldingly engaged with that of the pinion, a reciprocating gear-rack in mesh with the pinion, a notched flange on the spindle adjacent to its bearing, and a spring-pressed pawl coöperating with the notched flange.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN ARTHUR COCKER.

Witnesses:
F. J. WHITGROVE,
A. J. BATES.