J. STURGESS.

VARIABLE SPEED GEAR.

APPLICATION FILED JUNE 25, 1903.

923,212.

Patented June 1, 1909.

2 SHEETS—SHEET 1.

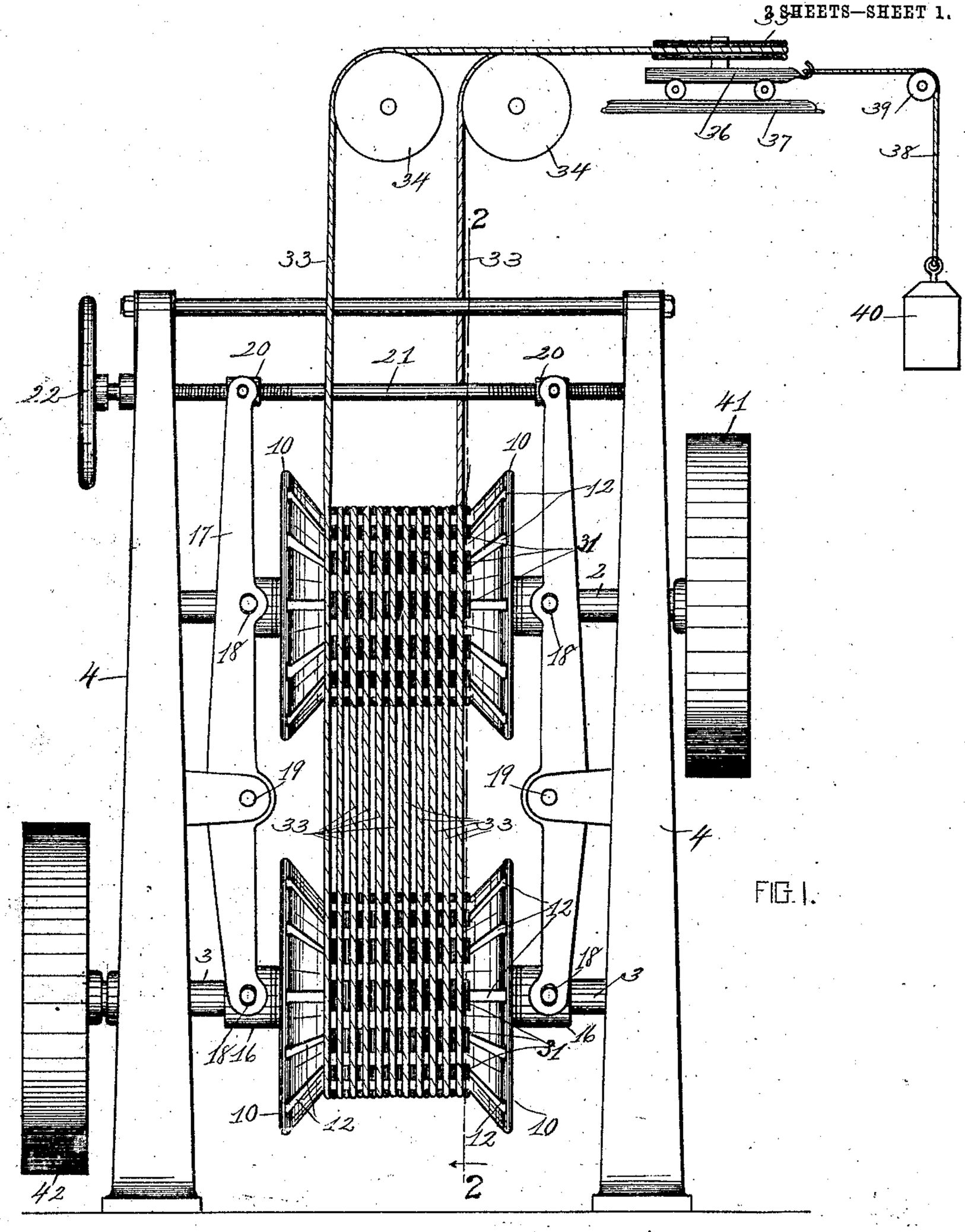

FIG. 1.

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2 SHEETS—SHEET 2.

Fig. 5

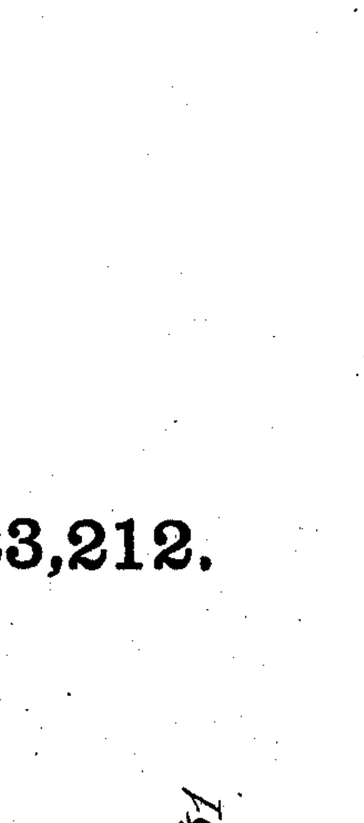

Fig. 4

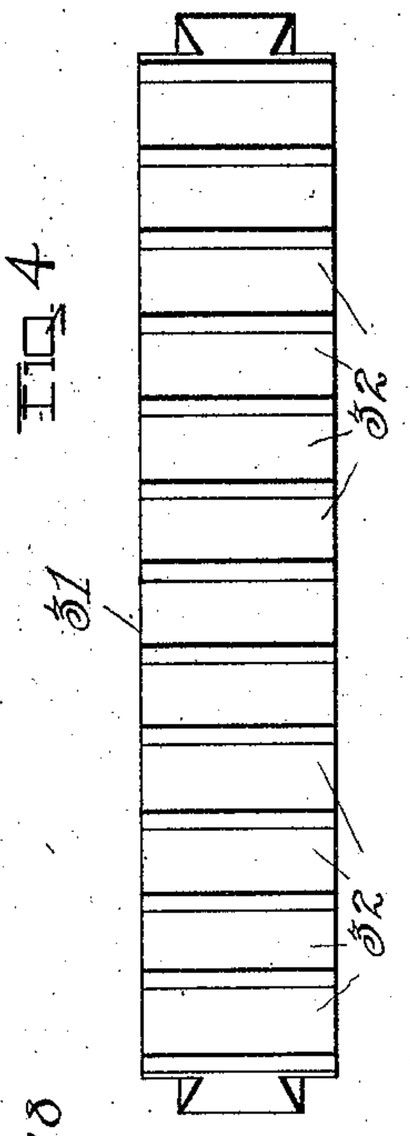

Fig. 6

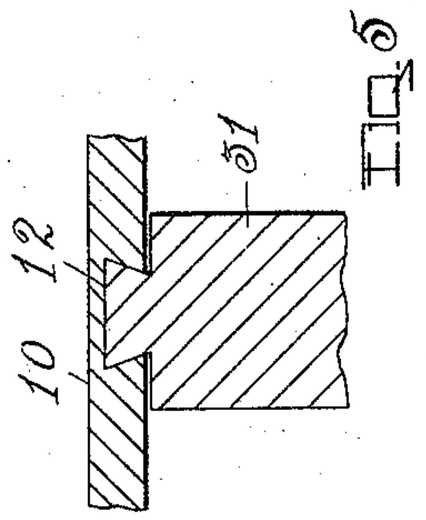

Fig. 2.

WITNESSES

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UNITED STATES PATENT OFFICE.

JOHN STURGESS, OF TROY, NEW YORK, ASSIGNOR TO STURGESS GOVERNOR ENGINEERING COMPANY, OF WATERVLIET, NEW YORK, A CORPORATION OF NEW YORK.

VARIABLE-SPEED GEAR.

No. 923,212. Specification of Letters Patent. Patented June 1, 1909.

Application filed June 25, 1903. Serial No. 163,096.

To all whom it may concern:

Be it known that I, JOHN STURGESS, a citizen of the United States, residing at Troy, county of Rensselaer, and State of New York, have invented certain new and useful Improvements in Variable-Speed Gears, of which the following is a specification.

The invention relates to such improvements and consists of the novel construction and combination of parts hereinafter described and subsequently claimed.

Reference may be had to the accompanying drawings, and the reference characters marked thereon, which form a part of this specification. Similar characters refer to similar parts in the several figures therein.

Figure 1 of the drawings is a view in front elevation of a variable speed gear embodying my invention. Fig. 2 is a vertical cross-section of the same taken on the broken line 2—2 in Fig. 1. Fig. 3 is a side view of one of the rope-supporting segments detached. Fig. 4 is a plan view of the same. Fig. 5 is a sectional view illustrating a dovetail connection between one of the rope-supporting segments and a segment-supporting member. Fig. 6 is a similar view illustrating a sliding key-connection between said parts.

The principal object of the invention is to provide a variable speed gear employing a continuous rope for transmitting power from one member to another thereof.

Other objects of the invention will appear in connection with the following description.

Referring to the drawings wherein the invention is shown in preferred form, 2 and 3, are parallel shafts rotatively mounted in bearings in the frame, 4, to one of which shafts power is transmitted through the pulley, 41, and from the other of which power is taken through the pulley 42.

Mounted upon the shafts, 2 and 3, to rotate therewith are a pair of pulleys of variable working diameter. Each of said pulleys comprises a pair of segment-supporting members, 10, mounted upon the supporting shaft with which said members are connected by means of a feather, 11, causing said members to partake of the rotary movement of said shaft while leaving them free to be moved longitudinally of the shaft toward and from each other. These segment-supporting members are formed with inclined segment-supporting slideways, 12, convergent toward the supporting shaft, the slideways of one member being located opposite those of the other respectively, each pair of oppositely located slideways being adapted to receive and have a sliding wedgewise engagement with the opposite ends of the rope-supporting segments 31. The plurality of segments so supported may be confined, or retained, between said members, 10, in any known manner, by keys, dovetails, or the like: two forms of such connection being shown in Figs. 5 and 6.

The construction of the segments and their supporting-members is such that as the supporting-members are separated from each other, the segments are drawn inwardly to reduce the working diameter of the pulley, while as the supporting-members are caused to approach each other the segments are forced outwardly along their slideways to increase the working diameter of the pulley.

The adjustable members, 10, of each pulley are adapted to be moved toward each other upon their supporting shaft by engagement with the hubs of such members of the respective sleeves, 16, through which their supporting shaft loosely passes, with which sleeves, respectively, operating levers, 17, have slotted pivotal connections at 18.

Each of the levers, 17, is fulcrumed at, 19, upon the frame of the machine, and has its upper arm thus connected with a sleeve, 16, on the shaft, 2, and its lower arm with a like sleeve, 16, on the shaft 3.

The upper ends of the respective levers, 17, have slotted pivotal connections with the nuts, 20, on the right and left-hand threaded screw-shaft, 21, rotatively mounted in bearings in the frame of the machine and adapted to be operated by means of the hand-wheel 22. Operation of said screw-shaft in one direction thus serves to draw together the nuts, 20, and upper ends of the levers, 17, causing the segment-supporting members, 10, of the pulley on the shaft, 2, to be moved toward each other to increase the working diameter of said pulley, and at the same time causing the sleeves, 16, on the shaft, 3, to be forced away from each other, permitting the disk-supporting members of the pulley on the shaft, 3, to be separated from each other, and the segments therebetween forced inwardly toward each other by the pressure exerted by the driving-rope, 33, upon said segments. In like manner, operation of said screw-shaft in the opposite direc-

tion causes a movement of separation of the nuts, 20, and of the sleeves, 16, on the shaft, 2, permitting the segment-supporting members on said shaft to separate under pressure of the driving rope exerted through the segments, 31, to contract the upper pulley and at the same time positively forces toward each other the segment-supporting members, 10, on the shaft, 3, causing the segments mounted therein to be forced outwardly to expand the lower pulley.

Each of the segments, 31, is provided with parallel grooves, 32, arranged in circumferential lines with like grooves respectively in the other segments, and adapted to receive the respective loops of a rope-belt, 33, which has a plurality of loops passing around both pulleys, and one of its loops passing also over guide-pulleys, 34, and around a take-up pulley, 35, supported upon a carriage, 36, movable along track, 37, which carriage is connected by a cable, 38, passing over the guide-pulley, 39, with the take-up weight, 40, adapted to maintain a uniform tension of the rope under various conditions.

Any known means may be employed for varying the effective working diameter of the respective pulleys.

What I claim as new and desire to secure by Letters Patent is—

1. In a variable speed gear, and in combination, a pair of shafts; a pair of pulleys of variable relative working diameters mounted on the respective shafts provided with circumferential rope-receiving grooves; means for varying the relative working diameters of said pulleys; a single integral rope-belt extending in a plurality of loops around and connecting said grooved pulleys; and an automatic take-up engageable with one of the loops of said rope-belt.

2. In a variable speed gear, and in combination, a pair of shafts; a pulley of variable diameter on one of said shafts having segments each provided with a plurality of parallel grooves arranged in circumferential lines with like grooves respectively in the other segments, and adapted to receive the respective loops of a rope-belt; means for expanding and contracting said pulley; a pulley on the other of said shafts having corresponding circumferential grooves; a single integral rope-belt having a plurality of loops extending around and connecting said grooved pulleys; and an automatic take-up engageable with one of the loops of said rope-belt.

In testimony whereof, I have hereunto set my hand this 23rd day of June, 1903.

JOHN STURGESS.

Witnesses:

GEO. A. MOSHER,

E. M. O'REILLY.