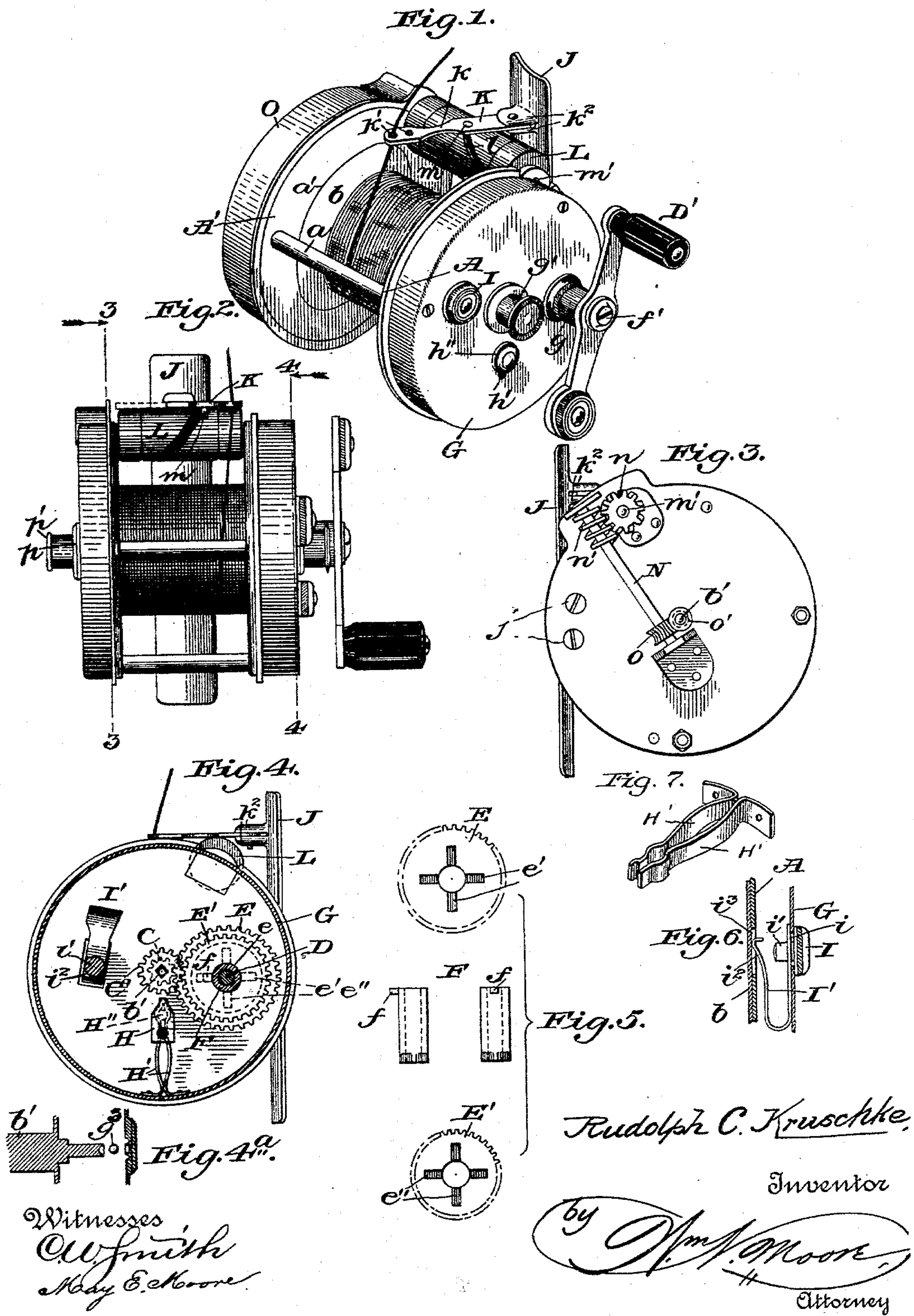


(No Model.)

R. C. KRUSCHKE.  
FISHING REEL.

No. 583,913.

Patented June 8, 1897.





# UNITED STATES PATENT OFFICE.

RUDOLPH C. KRUSCHKE, OF DULUTH, MINNESOTA.

## FISHING-REEL.

SPECIFICATION forming part of Letters Patent No. 583,913, dated June 8, 1897.

Application filed June 15, 1896. Serial No. 595,606. (No model.)

*To all whom it may concern:*

Be it known that I, RUDOLPH C. KRUSCHKE, a citizen of the United States, residing at Duluth, in the county of St. Louis and State of Minnesota, have invented certain new and useful Improvements in Fishing-Reels; 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.

My invention relates to improvements in fishing-reels of that class which employ high and low speed gear for the line-spool; and the objects that I have in view are, first, to provide a simple and efficient type of gearing for rotating the line-spool at different speeds; secondly, a novel construction of the click or pawl which operates to hold the line-spool from rotation when desired; thirdly, a simple and easily-operated brake device to retard the line-spool; fourthly, a peculiar form of line-guide which operates to coil the line evenly and regularly on the line-spool, and, fifthly, in an adjustable ball-bearing for the line-spool arbor.

With these and such other ends in view as pertain to a structure of this character my invention consists in the novel combinations of devices and in the peculiar construction and organization of parts, as will be hereinafter fully described and claimed.

To enable others to understand my invention, I have illustrated the preferred embodiment thereof in the accompanying drawings, forming a part of this specification, and in which—

Figure 1 is a perspective view of my fishing-reel. Fig. 2 is a front elevation showing the vibrating arm and the cam-formed cylinder that actuates said arm. Fig. 3 is a side view with the cap on the left side removed to show means for operating the cam-formed cylinder, taken on line 3 3 of Fig. 2. Fig. 4 is a sectional view on line 4 4 of Fig. 2. Fig. 4<sup>a</sup> is a detail view of the ball-bearing. Figs. 5 and 6 are detail views of the speed-gear and brake devices, respectively. Fig. 7 is a detail view of the two leaves of the spring that holds the slidable dog.

Like letters of reference indicate corresponding parts in all the figures of the drawings, referring to which—

A A' designate the supporting disk-like

plates, which are joined or coupled by the bridge-posts *a*, the parts being rigidly fastened together to produce the main or supporting frame for the line-spool of the reel. In the opposing faces of these supporting-plates A A' are formed the annular recesses *a'*, in which are fitted the disks or heads *b* of the line-spool, on which the cord or fishing-line is designed to be wound or coiled. This line-spool has a shaft *b'*, the ends of which pass through suitable axial openings in the disks or plates A A', whereby the shaft is journaled in the plates in a manner to insure free rotation of the line-spool.

I will now proceed to describe the preferred embodiment of the changeable-speed gear. One end of the line-spool shaft *b'* is made square or of other polygonal form, as at *b''*, and on this squared end of the shaft are fitted the pinions C C', one of which is larger than the other, and both pinions having squared axial openings to adapt them to fit on the line-spool shaft in a manner to rotate therewith. At a suitable distance to one side of the line-spool shaft is provided the arbor or spindle D, which is fastened at one end to the plate A, and on this arbor is loosely fitted the two gear-wheels E E', which are of different sizes, the large gear E meshing with the smaller of the two pinions C to form the high-speed gear, while the smaller gear-wheel E' meshes with the larger of the two pinions C' to constitute the low-speed gear. In connection with these loose gear-wheels and the handle D' for operating the same I have combined the endwise-movable and rotating sleeve F, which is of such length as to pass through axial circular openings *e* in the two gear-wheels E E', said sleeve F being fitted loosely on the spindle D to rotate freely thereon. The two gear-wheels and the sleeve are constructed in a peculiar way to adapt them for joint operation—that is, to enable the sleeve to be interlocked with either of the two gears E E', according as it is desired to rotate the line-spool at high or low speed. In one face of the gear E is provided a series of radial notches forming the seats *e'*, and in the face of the gear E', which is opposed to the notched face of the gear E, is a similar series of radial notches *e''*. On the inner end of the sleeve F is provided a radial lug *f*, and as the sleeve is adapted to have a limited



endwise movement it is obvious that the lug  $f$  thereof can be adjusted to take into one of the notches  $e'$  or  $e''$  of the gear  $E$  or  $E'$ , whichever it may be desired to use. The operative parts of the reel for actuating the line-spool are housed or inclosed within a flanged cap  $G$ , which is fastened to the plate  $A$  by means of screws or other suitable fasteners. This cap  $G$  is formed with a hollow boss  $g$ , through which passes the outer end of the sleeve  $F$ , and to provide for the secure attachment of the handle  $D'$  to the sleeve  $F$  I make the outer end of said sleeve of square or polygonal form and produce a square opening in the handle  $D'$  to fit over the squared end of the sleeve  $F$ , the handle being prevented from slipping off the sleeve  $F$  by means of the headed screw  $f'$ , which works in a threaded socket tapped into the squared end of the sleeve, all as clearly shown in the drawings. It will readily be seen that the handle  $D'$  and the sleeve may be adjusted endwise to cause the lug  $f$  on the inner end of the sleeve to take into a notch in one of the gears  $E$  or  $E'$ , and the gear will thus be locked with the sleeve to rotate therewith. When the sleeve is interlocked with the gear  $E$ , the handle may be rotated to drive the line-spool, through the gear  $E$  and pinion  $C$ , at a high speed; but when the sleeve is disengaged from the gear  $E$  and its lug is engaged with the smaller gear  $E'$  the handle may operate the gear  $E'$  and pinion  $C'$  to rotate the line-spool at a slow speed.

My means for arresting the rotation of the line-spool consists of a slidable dog  $H$ , which is in the form of a block or piece with a beveled or pointed end. This dog is fast with a stem  $h$ , which passes through a slot  $h'$ , formed in the cap-plate  $G$  and having at its outer end a thumb-piece or head  $h''$  for its convenient manipulation by hand from the outside of the reel. This dog is held or confined in place by and between the spring-arms  $H'$ , which are suitably fastened to the inside of the cap  $G$ . These spring-arms are arranged alongside of each other in position to clasp the stud  $H''$  of the dog between themselves, and one of these arms has an angular or irregular formed end, as shown. When the dog is retracted or moved away from the line-spool shaft, so that its beveled end is clear of the gear-pinions thereon, the stud  $H''$  of the dog fits in a curved part of one arm and is held therein by the pressure of the other arm, whereby the dog is prevented from slipping out of place. To arrest the reel-spool  $B$  from rotation, the head or thumb-piece of the dog is pushed by the hand in a direction to move the dog beyond the angular end of the spring-arm and so that its beveled toe will take or catch in between the teeth of one of the gear-pinions  $C$  or  $C'$  on the squared end of the line-spool shaft.

The brake device for retarding the rotation of the line-spool is adapted to be thrown into and out of action by the simple adjustment of the thumb-piece  $I$ , which is arranged on

the outside of the cap  $G$ , so as to conceal the slot  $i$  therein. To this thumb-piece is attached a pin  $i'$ , which passes through the slot  $i$ , and on the inner end of this pin is fastened the brake-spring  $I'$ , which consists of a bent or doubled spring forming the two arms, one of which is fastened to the pin  $i'$  in a suitable way. The other arm of the brake-spring is free from restraint, and it is bent to form the lip  $i^2$ , which is adapted to pass through the slot  $i^3$ , formed in the plate  $A$ , to enable the free end of the brake-spring to have access to one of the heads or disks of the line-spool. It is evident that the thumb-piece  $I$  may be adjusted to a position where the free end of the brake-spring will rest or bear against the plate  $A$ , so that the brake-spring will not exert its pressure on the line-spool. Hence the spool can rotate without restraint from the brake; but when it is desired to retard the rotation of the line by the restraint of the brake-spring the thumb-piece is adapted to move the spring  $I'$  to a position where its toe will pass through the slot in the plate  $A$ , and thereby adapt the spring to ride and press against a head of the line-spool.

It is to be noted that the changeable-speed gear, the brake device, and the checking-pawl are all housed or inclosed between the flanged cap  $G$  and the plate  $A$  of the reel-casing, and the better to hold the line-spool shaft in position I have provided the hollow boss  $g'$ , which is interiorly screw-threaded to afford a bearing for the screw  $g^2$ , the point of which fits against the ball-bearing  $g^3$ , seated in cavities in the screw, and end of the line-spool shaft.

$J$  designates the butt-plate, which is shaped to conform to the rod upon which the reel is to be used. This plate  $J$  is formed with the angular flanges, which are fitted between the plates  $A$   $A'$  of the reel, and are securely attached thereto in a suitable way—as, for instance, by means of screws  $j$ . This butt-plate also forms the support for the line-guide  $K$ , which is operated to direct the line or cord in a manner to cause the same to be wound uniformly on the line-spool. This guide  $K$  consists of an arm  $k$ , having an eye or eyes  $k'$  at its free end for the passage of the line or cord. The other end of this arm  $k$  is fitted between a pair of lugs or ears  $k^2$ , attached to or integral with the butt-plate, and the arm  $k$  and the ears are joined together by a transverse pivot-pin or rivet, whereby the arm  $k$  is supported on the butt-plate in a manner to vibrate back and forth under the influence of the rotary cam-formed cylinder  $L$ . This cylinder is formed with the irregular slot or groove  $l$ , in which is fitted a stud or friction-roller  $m$ , which is attached to the arm  $k$ . The cylinder  $L$  is carried by a shaft  $m'$ , journaled in suitable bearings on the plates  $A$   $A'$  of the reel, and to one end of this shaft  $m'$  is secured a worm-gear  $n$ , which meshes with a worm  $n'$  on a counter-shaft  $N$ , the other end of which counter-shaft has a worm  $o$ , arranged



to mesh with a worm-gear  $o'$  on the end of the line-spool shaft. This counter-shaft is arranged in substantially a radial position on the plate  $A'$ , between the line-spool shaft and the shaft  $m'$  of the cam-cylinder, and said counter-shaft is journaled in suitable bearings on the plate  $A'$ . As the line-spool is rotated it serves to drive the counter-shaft  $N$ , which in turn rotates the shaft  $m'$  and the cam-cylinder  $L$ , the latter causing the vibrating arm  $k$  to swing back and forth across the face of the line-spool, so as to direct the cord or line thereon in a manner to lie uniformly on the line-spool. The cap-plate  $O$  is fastened to the plate  $A'$  in a suitable way, as by screws, and it is constructed to inclose the end of the reel to which it is applied in a manner to exclude dust from the counter-shaft  $N$  and the gearing by which the cam-cylinder is actuated by motion derived from the line-spool shaft. This cap  $O$  has a central boss  $p$ , which receives an adjustable screw  $p'$ , which has a cavity for a bearing-ball  $p''$  fitted in a cavity in the end of the line-spool shaft which projects into the cap  $O$ .

It is thought the operation and advantages of my invention will be readily understood and appreciated by those skilled in the art from the foregoing description taken in connection with the drawings.

What I claim as new is—

1. In a fishing-reel, the combination with a line-spool shaft, of different-sized pinions thereon, a spindle, a slidable sleeve fitted on the spindle, and different-sized gears fitted on the sleeve and adapted to be interlocked with the same at will, said gears meshing with said pinions, as and for the purposes described.

2. In a fishing-reel, the combination with a line-spool shaft, of pinions secured thereon, a fixed spindle, a slidable sleeve fitted on said spindle and having a stud  $f$  at inner end and a suitable handle, and the gears fitted on the sleeve and meshing with the pinions, said gears being provided with the radial seats into either of which may be adjusted the stud of said sleeve, as and for the purposes described.

3. In a fishing-reel, the combination with a gear composed of different-sized pinions arranged on a line-spool shaft, of a slidable dog having a pointed toe, an operating-piece connected with the dog, and the spring-arms, one of the arms having a seat and the other an irregular-formed end to clasp and receive a stud on the dog, as and for the purposes described.

4. In a fishing-reel, the combination with a slotted supporting-plate, and a line-spool having one of its heads arranged laterally adjacent to the supporting-plate, of a cap,  $G$ , fastened to the supporting-plate and provided with a slot  $i$ , the operating-piece,  $I$ , fitted in the slot of the cap, and a brake-spring  $I'$  doubled or folded to provide the two arms and arranged laterally between the cap  $G$  and the supporting-plate, one arm of the doubled spring attached to the operating-piece  $I$  and the other arm provided with a toe,  $i^2$ , arranged to ride against the supporting-plate or to pass through the slot therein and bear on the line-spool to retard the latter, as and for the purposes described.

5. In a fishing-reel, the combination with the connected plates forming a part of the frame or casing for the line-spool, and a line-spool shaft journaled in said plates and having a worm  $o$  at one end, of the butt-plate  $J$  fitted between the supporting-plates and rigidly attached thereto, a cam-formed cylinder  $L$  journaled in the supporting-plates adjacent to the butt-plate and having the worm,  $n$ , attached to one end of its shaft, a vibrating guide-arm,  $K$ , pivoted to the butt-plate and having a pin or roller engaging with the cam-formed cylinder, and a radial counter-shaft  $N$  journaled on one supporting-plate and having worm-gearing connecting its respective ends with the gears  $o$  and  $n$  of the line-spool shaft and the cam-formed cylinder, as and for the purposes described.

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

RUDOLPH C. KRUSCHKE.

Witnesses:

FRANK HICKS,  
CHARLES DRAPER.