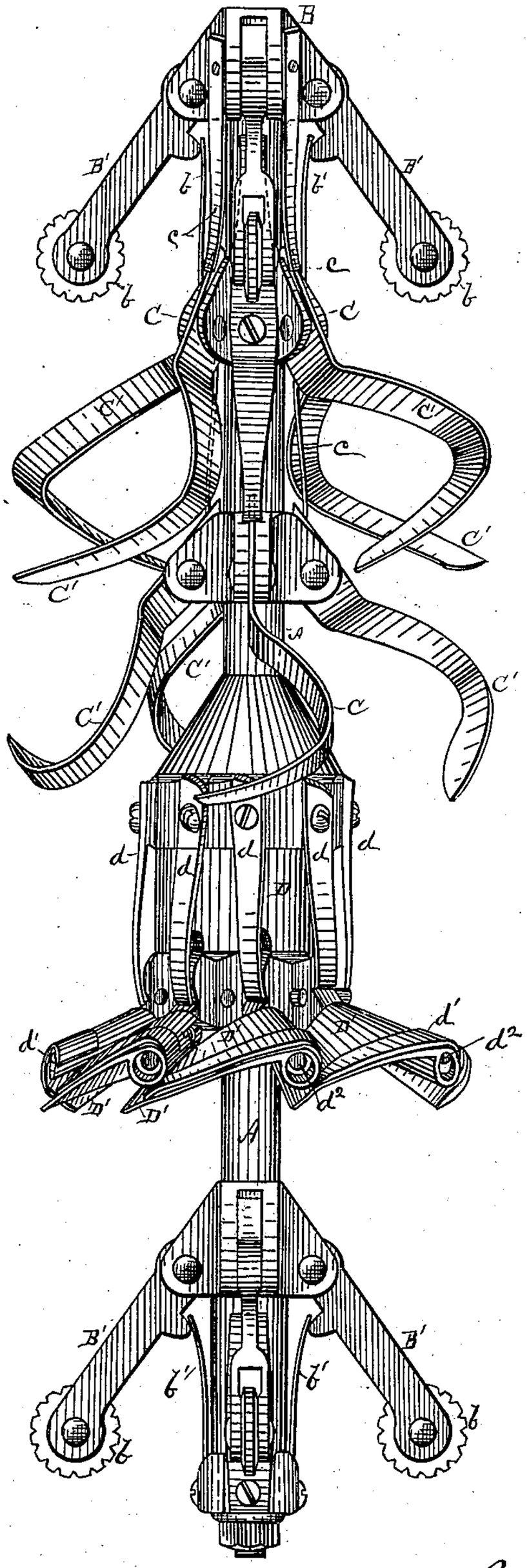
(No Model.) 3 Sheets—Sheet 1.

J. S. KLEIN.

PIPE LINE CLEANER.

No. 332,910. Patented Dec. 22, 1885.

Fig I.



Witnesses.
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(No Model.) 3 Sheets—Sheet 2.

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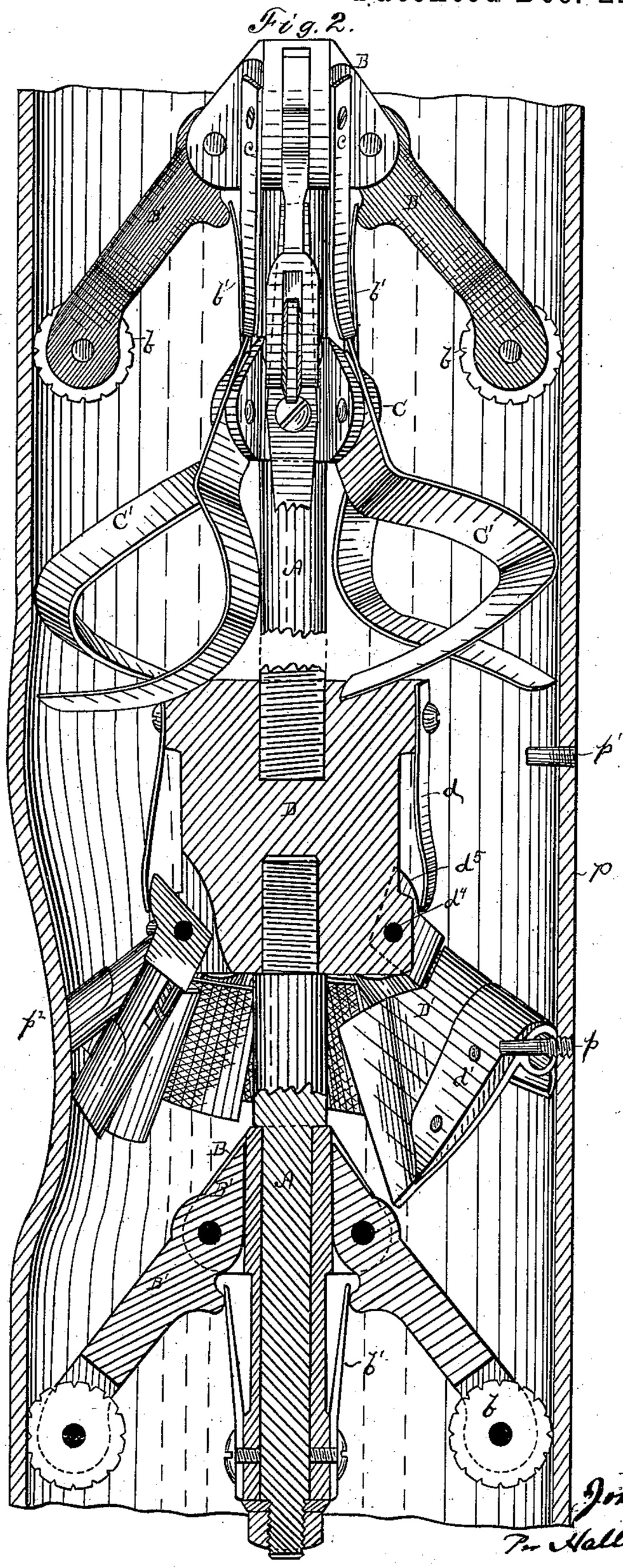
Fig. 2.



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(No Model.) 3 Sheets—Sheet 3.

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Fig. 3.

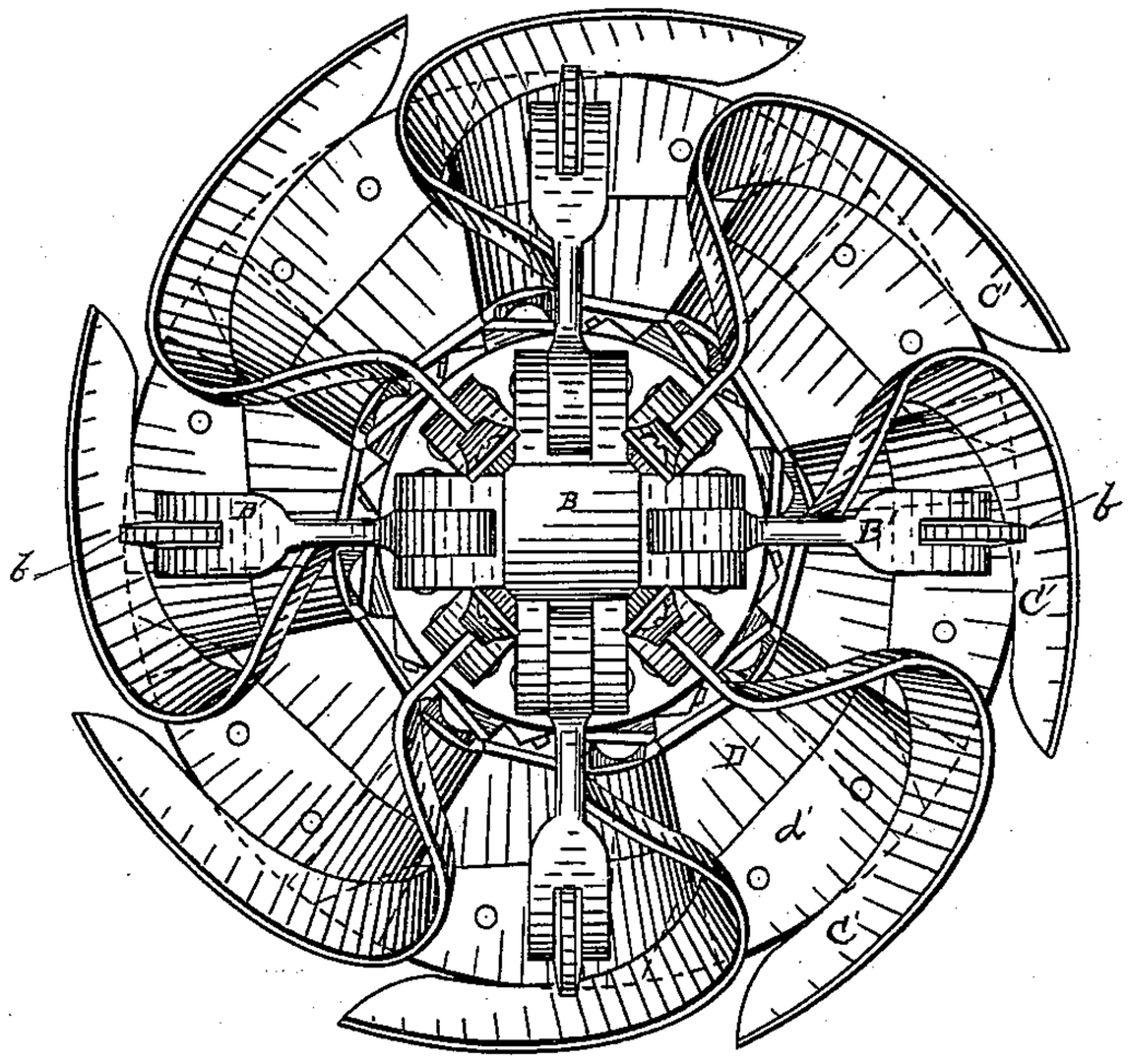


Fig. 4.

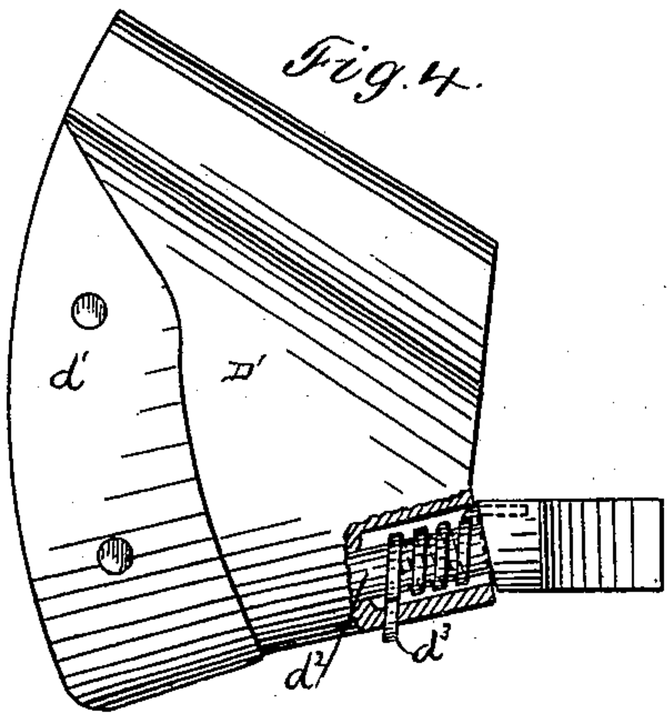
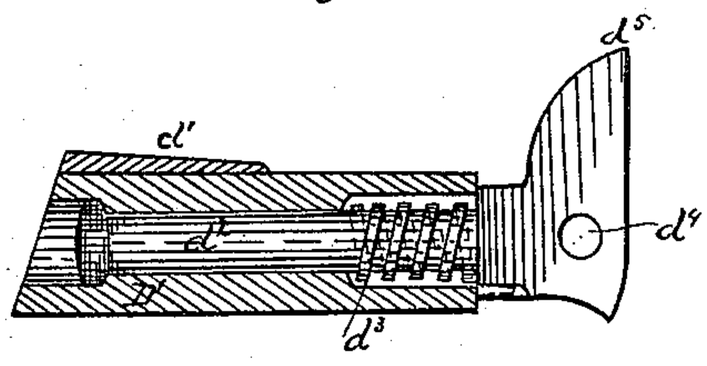


Fig. 5.



Witnesses.
W. R. Edelen
R. H. Porter.

Inventor.
John S. Klein
per Hallock & Hallock
Attys.

UNITED STATES PATENT OFFICE.

JOHN S. KLEIN, OF OIL CITY, PENNSYLVANIA.

PIPE-LINE CLEANER.

SPECIFICATION forming part of Letters Patent No. 332,910, dated December 22, 1885.

Application filed March 6, 1885. Serial No. 157,978. (No model.)

To all whom it may concern:

Be it known that I, JOHN S. KLEIN, a citizen of the United States, residing at Oil City, in the county of Venango and State of Pennsylvania, have invented certain new and useful Improvements in Pipe-Line Cleaners; 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.

Pipe-lines used for transporting fluids become coated on the inside with sediment or condensation, thus impairing their conducting capacity, and so require cleaning out. This is especially true of pipe-lines for conducting crude petroleum, as the deposit of paraffine is very great, especially in cold weather.

The object of my invention is to provide a device which can be sent through the line of pipe with the fluid, and as it passes will scrape and clean off the inside of the pipe.

Devices for this purpose have been heretofore constructed, and therefore my invention consists in improvements upon the construction of such a device.

My invention is illustrated in the accompanying drawings as follows:

Figure 1 is a side elevation of the device complete. Fig. 2 is a view, partly in section and partly in elevation, of the device, with a section of it broken out to shorten the figure, and it is represented as in a section of pipe. Fig. 3 is a front elevation. Figs. 4 and 5 show details of construction.

The device consists of a stem, A, having at each end a whirl of yielding supporting-arms, B′, and, arranged intermediately between these supports, one or more whirls of yielding scrapers, C′, and a whirl of yielding pivoted and overlapping plates, D′, which form a disk to receive the action of the moving fluid and propel the device.

The arrangement of the parts in relation to each other upon the stem, as above stated, may be varied, as it is not at all essential.

As the pipe of which conduits are made may be indented, as shown at p^2 in Fig. 2, or may have to be tapped to draw off accumulations of foreign fluids and spiked to close the tap-opening, as shown at p and p' in said figure, and as the couplings and the branch connections and cut-off valves also form unevenness in the inner walls of the pipe, it is obvious that for a scraping device to pass freely along in the conduit it must have all its parts which come in contact with the walls capable of yielding, so as to slip over obstructions. This I have fully provided for to such an extent that my device can be compressed so as to pass through a considerably smaller orifice than the main pipe—such, for example, as a gate-valve.

The construction of my device is as follows: The stem A is a rod of iron or steel of, say, three-fourths of an inch diameter. At each end of this is a head, B, with ears, between which are pivoted the arms B′. I show the rear head, B, swiveled on the stem A—a feature which may be followed or not, as desired. At the ends of the arms I prefer to put spurred wheels *b;* but this is not essential. The object of spurring the wheels is to prevent them standing still and sliding along the pipe. The spurs catch on the pipe at the joints and rotate the wheels. These arms are kept extended by springs *b′*, which allow them to yield freely if the arms strike an unyielding obstruction in the pipe. I have shown four of these arms in each head. More or less may be used, if desired.

The scrapers C′ are pivoted in heads C in a similar manner to the arms, as above described, and are kept extended by springs *c*, which allow them to yield to pass obstructions. There may be as many scrapers in each whirl and as many whirls on the stem as desired. The scraper-blades are curved so as to lie on the wall of the pipe spirally. This form is given to the scraper-blades, so that if they catch on a spike or other projection they will slip off by giving the device a rotary action. The device moves with the fluid in the conduit by reason of its action upon the propelling-disk. It would be impractical to use a rigid disk of sufficient size to fill the bore of the pipe, and it is desirable that the disk be as large as possible, so, while the device might be propelled by a small rigid disk, I have, for the reasons stated, provided a yielding disk, which will fill the bore of the conduit. The construction of this disk is as follows: In the head D are pivoted in a whirl a series of

arms, d^2, which are in the form of a right-angle lever. A spring, d, bears upon the short arm of the lever and keeps the long arm extended. On each of the arms are pivoted gates or plates D′, which are in general form that of a sector curved or arched slightly, and they are of sufficient width to lap, as clearly seen in Fig. 1. They are kept up against each other by a contained spring, d^3, (seen clearly in Fig. 4,) and of course the pressure of the fluid upon them will also keep them closed. It will be seen that these gates can have two movements—one upon their own pivot on the bar d^2 and the other upon the pivot d^4 of the bar. The purpose of these two movements is clearly shown in Fig. 2, where on the left they are seen as moved on the pivot d^4, so as to pass the indentation p^2, and on the right one is shown as turning on its own pivot, so as to pass the spike p. Each plate or gate has its outer edge faced with a hard-steel facing, d', for the purpose of preventing the edge being worn away by its action on the conduit-walls.

By reference to Fig. 3 it will be seen that the scraper-blades stand out beyond the disk, and it should be stated that this is only the case when the device is not confined in the pipe.

The device can be used to serve its purpose very well without the scraper-blades, as the disk-plates will act as scrapers; or the supporting-arms may be omitted and not destroy the usefulness of the device, and the propeller-disk here shown may be used to propel a cleaner of different construction otherwise.

What I claim as new is—

1. In a pipe-line cleaner, the combination, substantially as set forth, of a central stem, one or more whirls of yielding supports, one or more whirls of yielding scraper-blades, and a whirl of yielding horizontally-pivoted plates forming a propelling-disk.

2. In a pipe-line cleaner, the combination, substantially as set forth, of a central stem, one or more whirls of yielding supports having spurred wheels pivoted at their bearing ends, one or more whirls of curved and yielding scraper-blades, and a whirl of yielding horizontally-pivoted plates forming a propeller-disk.

3. In a pipe-line cleaner, the combination, substantially as set forth, of a central stem, one or more whirls of yielding supports, and a whirl of yielding horizontally-pivoted plates forming a propeller-disk.

4. In a pipe-line cleaner, the combination, substantially as set forth, of a central stem, one or more whirls of yielding scraper-blades, and a whirl of yielding horizontally-pivoted plates forming a propeller-disk.

5. In a pipe-line cleaner, a propeller-disk consisting of the combination, substantially as set forth, of the head D, the whirl of yielding arms d^2, and the plates D′, horizontally pivoted on said arms, and arranged as shown, to form a disk.

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

JOHN S. KLEIN.

Witnesses:

JNO. K. HALLOCK,

ROBT. H. PORTER.

Correction in Letters Patent No. 332,910.

It is hereby certified that in Letters Patent No. 332,910, granted December 22, 1885, upon the application of John S. Klein, of Oil City, Pennsylvania, for an improvement in "Pipe-Line Cleaners," errors appear in the printed specification requiring correction as follows: The word "whirl," and its plural, "whirls," were improperly used by the printer insteadof *whorl* and *whorls* to designate certain parts of the invention; and that the Letters Patent should be read with the word *whorl* substituted for "whirl," and the word *whorls* for "whirls," wherever these words occur in the specification and claims, that the same may conform to the original papers of the case in the Patent Office.

Signed, countersigned, and sealed this 16th day of March, A. D. 1886.

[SEAL.]

H. L. MULDROW,
Acting Secretary of the Interior.

Countersigned:

M. V. MONTGOMERY,
Commissioner of Patents.