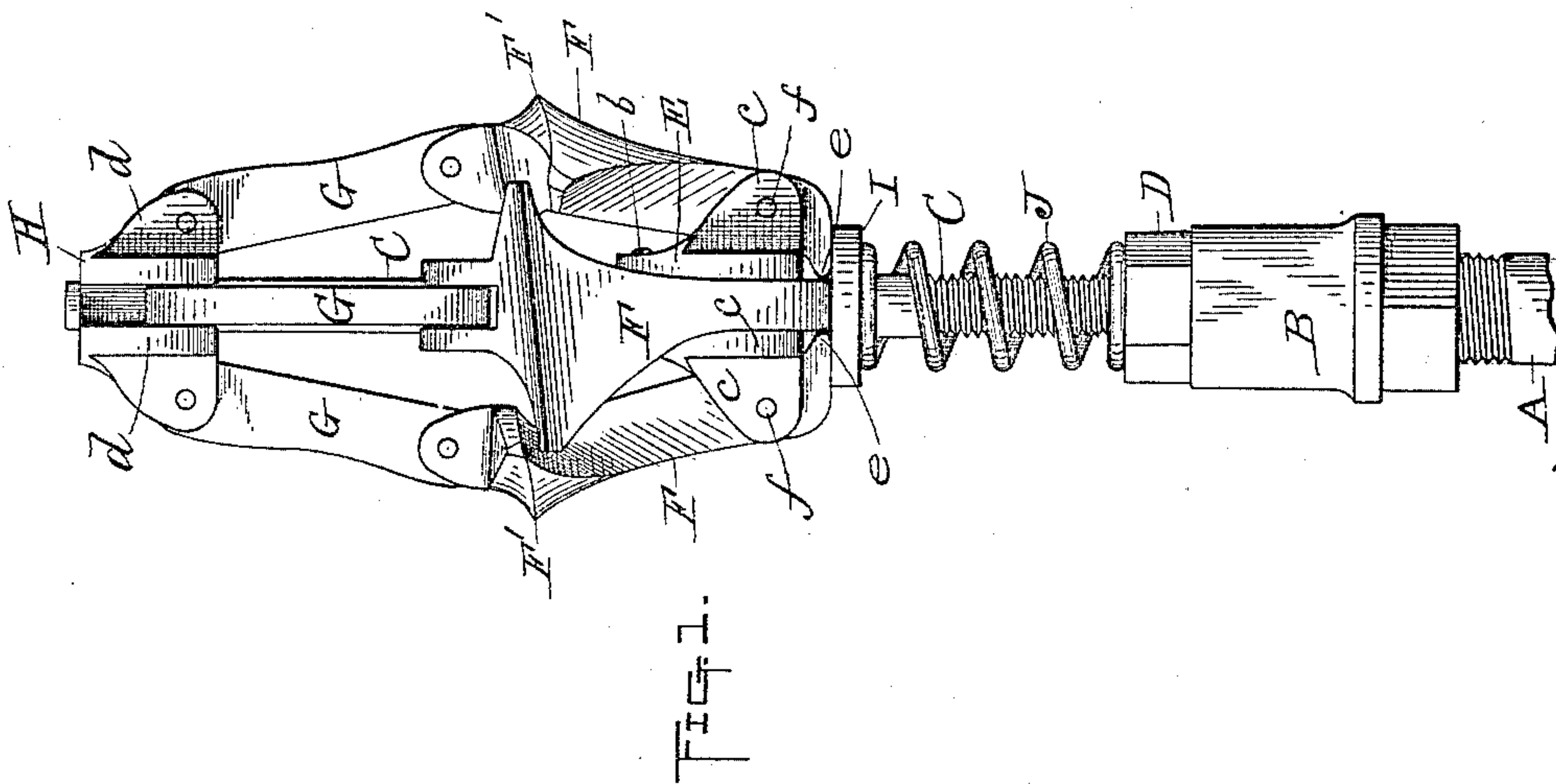
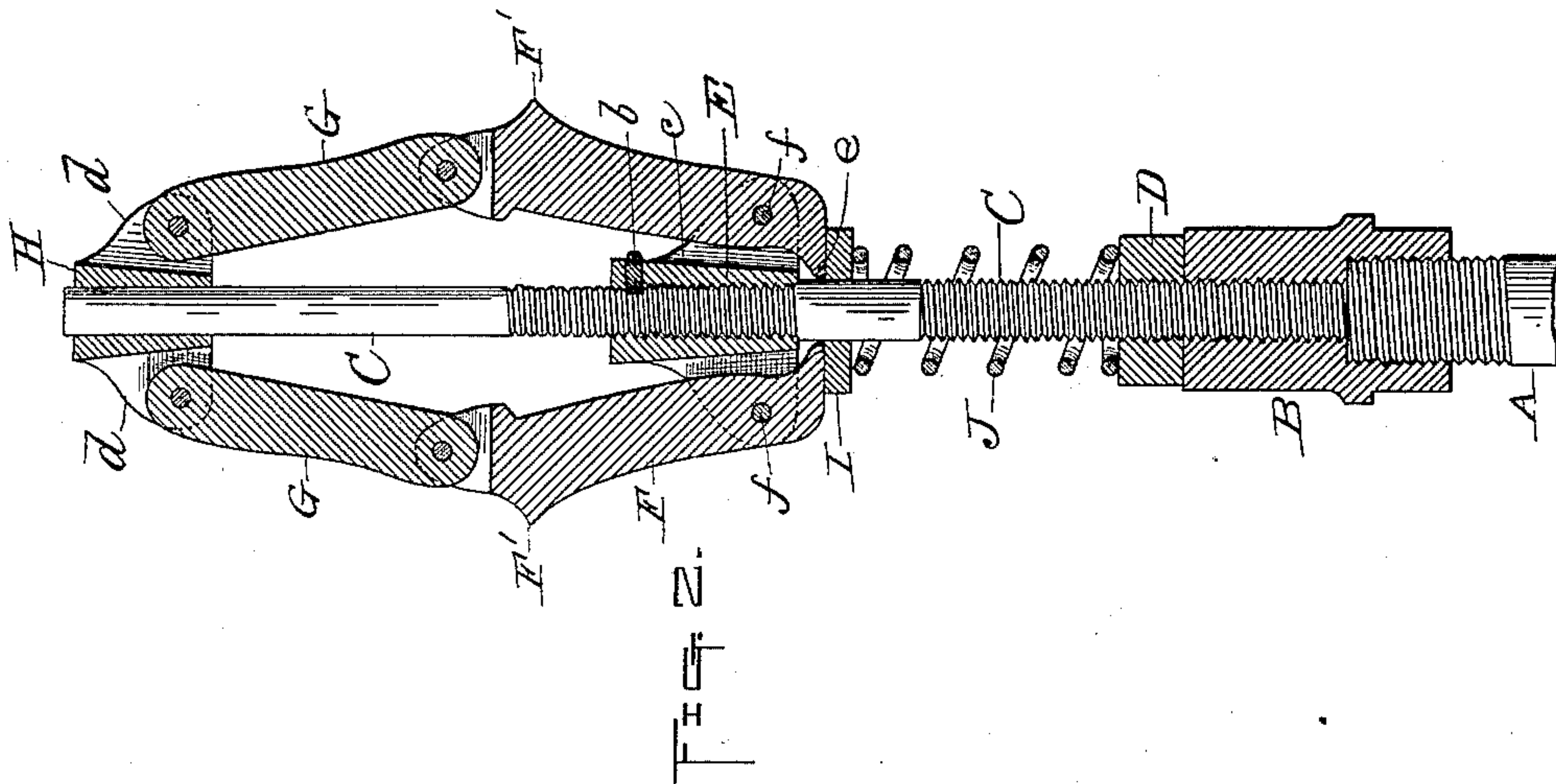


(No Model.)

H. S. INGALLS.
BOILER TUBE SCRAPER AND CLEANER.

No. 442,320.

Patented Dec. 9, 1890.



Witnesses
Walter B. Nourse,
G. Forrest Wilson.

Inventor.
Horace S. Ingalls.
By A. A. Barker, Atty.

UNITED STATES PATENT OFFICE.

HORACE S. INGALLS, OF MELROSE, ASSIGNOR OF ONE-HALF TO J. F. & C. G. WARREN & CO., OF WORCESTER, MASSACHUSETTS.

BOILER-TUBE SCRAPER AND CLEANER.

SPECIFICATION forming part of Letters Patent No. 442,320, dated December 9, 1890.

Application filed July 23, 1890. Serial No. 359,681. (No model.)

To all whom it may concern:

Be it known that I, HORACE S. INGALLS, of Melrose, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Boiler-Tube Scrapers and Cleaners; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, forming a part of this specification, and in which—

Figure 1 represents a side view of my improved tube scraper and cleaner, and Fig. 2 is a central longitudinal section thereof.

My invention consists in certain improvements in the construction of the jointed scraping-arms and the means employed for imparting an end yielding pressure to hold said arms in their normal expanded positions, as hereinafter more fully set forth.

To enable others skilled in the art to which my said invention appertains to better understand the nature and purpose thereof, I will now proceed to describe it more in detail.

In the drawings, A represents part of the rod to which the scraper is secured, said rod being turned into a threaded opening in the nut B. The usual spindle C is also turned into the opposite end of said nut, and is fastened in position from turning out by the set-nut D, both the rod and spindle being threaded for the above purpose. At about the middle of the spindle a flanged bearing-piece E is secured thereto by providing the same with a central threaded opening, so that it may be turned onto the threaded portion *a* of said spindle. Said bearing may be held from turning after being fitted to the spindle by means of a set-screw *b*. To the flanges *c* of bearing E are pivoted the inner ends of the usual scraping-arms F, four of which are shown in this instance. Said arms are provided with the usual inclined or curved scraping-edges *F'*, and their outer ends are pivoted to the inner ends of links G, whose outer ends are in turn pivoted to the flanges *d* of bearing H, fitted to slide on the outer end of the spindle.

Upon the inner ends of the scraping-arms

are formed cam projections *e*, extending inward against the spindle when the device is in its normal or expanded position, as shown in the drawings. Against said cam projections is fitted a ring I, which is in turn fitted to slide on the spindle, and between the ring and nut D is interposed a strong spiral spring J, which is fitted loosely over the spindle and exerts a constant pressure against the ring to force and hold the arms and links in their expanded positions, while at the same time permitting them to yield inward to conform to the pressure imparted thereto in pushing and drawing the device through the boiler-tubes in the operation of scraping and cleaning the same. The arms and links are thus forced outward by the ring bearing on the inner ends of said arms inside of the line of their pivots *f*, as is shown in the drawings. It will thus be seen that the device, while yielding readily, is at the same time held sufficiently firm against outside pressure to produce a good, strong, and serviceable scraper, not easily got out of repair and which may be manufactured cheaply.

The general principle of the device, it will be understood, is not new, and I therefore limit my invention to the specific construction shown and described for effecting the desired result.

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

1. In a boiler-tube scraper and cleaner, the spindle C, the inner flanged bearing E, secured thereto, and the outer flanged bearing H, fitted to slide thereon, in combination with the scraper-arms F and links G, pivoted together, the inner ends of said arms being also pivoted to bearing E and the links to bearing H, ring I, bearing against the inner ends of scraping-arms F, and a suitable spring for forcing the same against said arms, substantially as set forth.

2. In a boiler-tube scraper and cleaner, the nut B, adapted to hold the rod A and spindle C, set-nut D, said spindle C, and the inner flanged bearing E, secured to the spindle, in combination with scraper-arms F, having the

cam projections *e* on their inner ends, also
pivoted at said inner ends to the bearing E
and at their other ends to links G, said links
G pivoted to bearing H as well as the arms,
5 said bearing H fitted to slide on the outer end
of the spindle, ring I, bearing against the in-
ner ends of scraping-arms F, and a suitable

spring for forcing the same against said arms,
substantially as set forth.

HORACE S. INGALLS.

Witnesses:

C. F. WESSON,
LOUIS B. TENNY.