

(No Model.)

E. HILL.
STUFFING BOX FOR PISTON RODS.

No. 444,668.

Patented Jan. 13, 1891.

Fig. 1

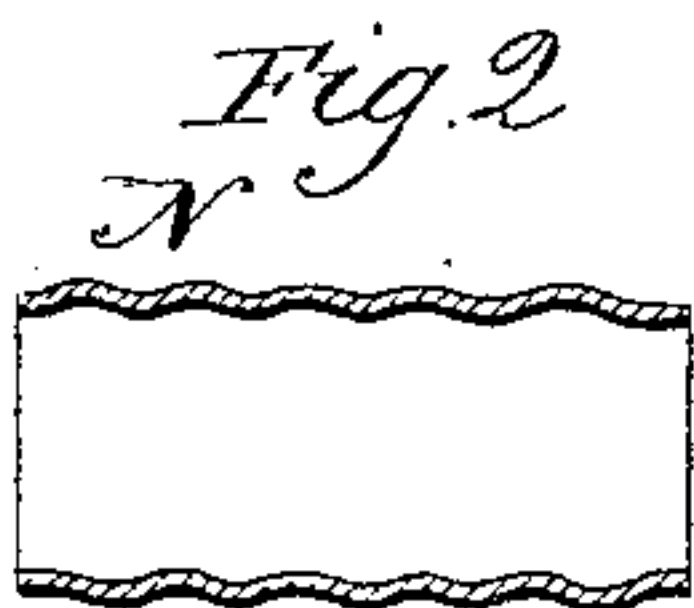
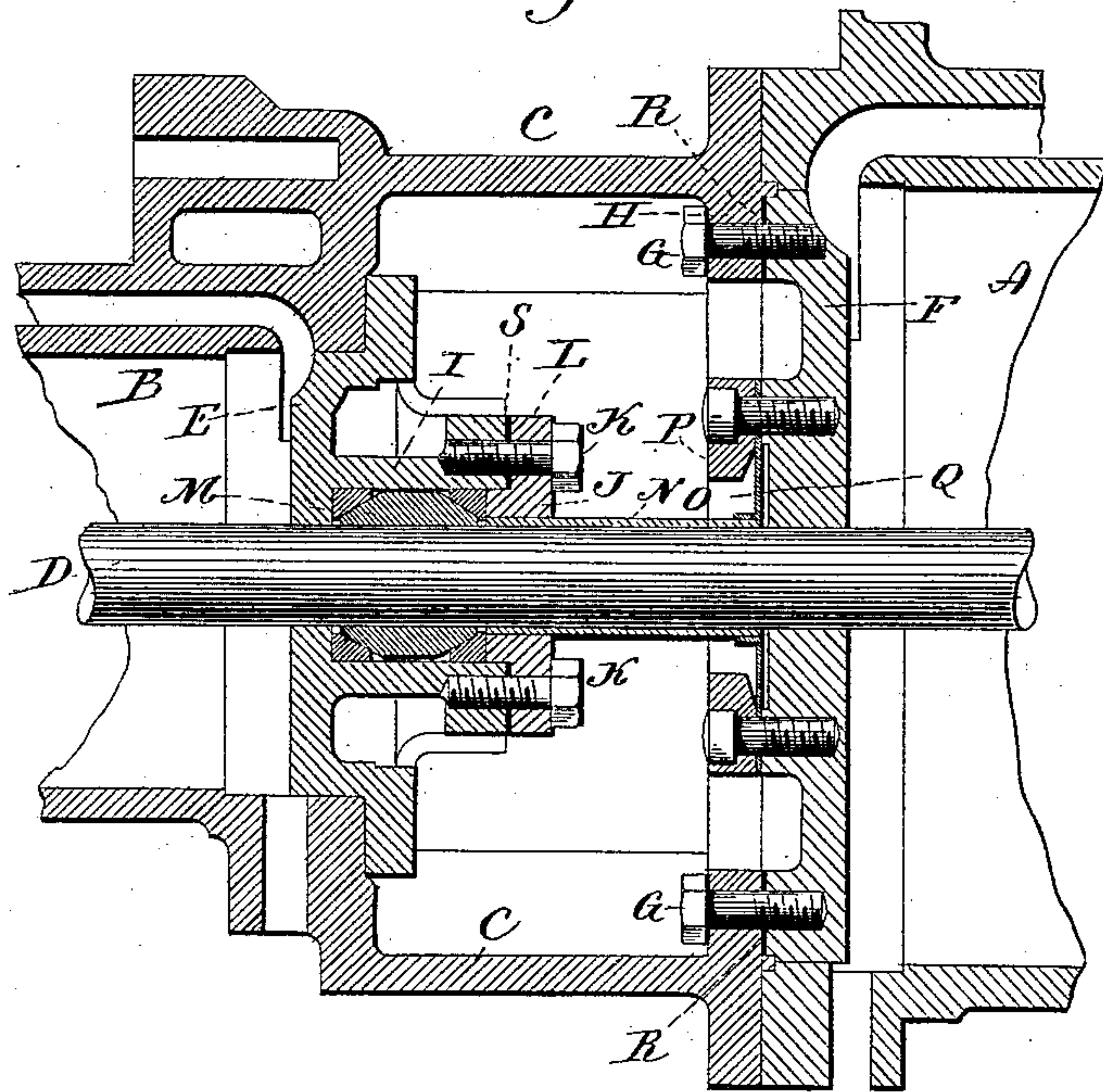
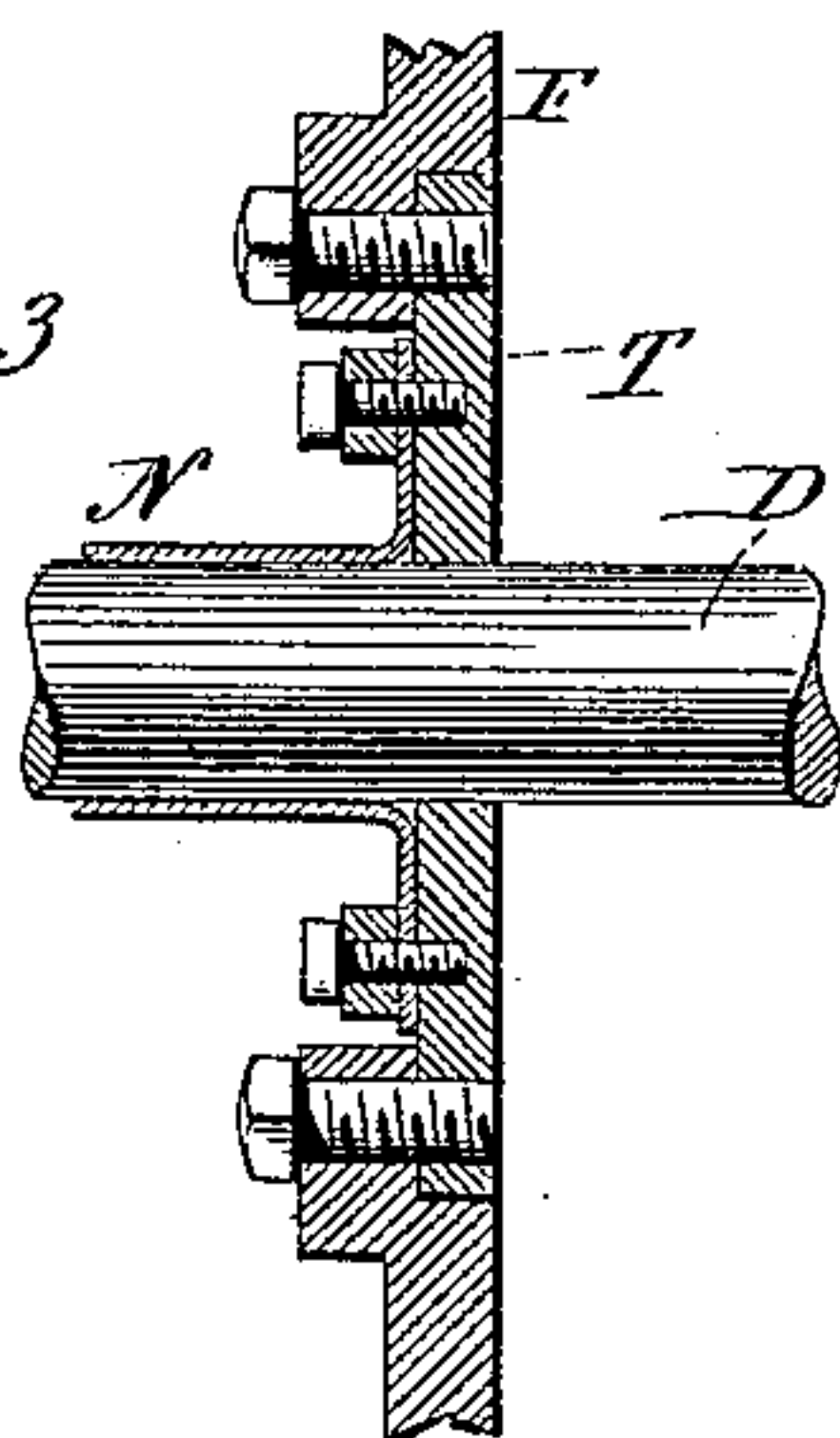


Fig. 3



Witnesses
J. K. Sumner
William D. Kelley

Ebenzer Hill
Inventor
By Atty.
Earle Seymour

UNITED STATES PATENT OFFICE.

EBENEZER HILL, OF SOUTH NORWALK, CONNECTICUT.

STUFFING-BOX FOR PISTON-RODS.

SPECIFICATION forming part of Letters Patent No. 444,668, dated January 13, 1891.

Application filed April 18, 1890. Serial No. 348,482. (No model.)

To all whom it may concern:

Be it known that I, EBENEZER HILL, of South Norwalk, in the county of Fairfield and State of Connecticut, have invented new Improvements in Stuffing-Boxes for Piston-Rods; and I do hereby declare the following, when taken in connection with accompanying drawings and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this specification, and represent, in—

Figure 1, a longitudinal central section through the adjacent heads of the two cylinders, showing the invention applied thereto; Figs. 2 and 3, modifications.

This invention relates to an improvement in the construction of the stuffing-box for the piston-rods of that class of machines in which two cylinders are arranged in line with each other, with a single piston-rod common to both, as in steam-pumps, compound engines, &c. It is desirable, to economize room, as well as to reduce the cost of the apparatus, to bring the adjacent ends of the two cylinders as near together as they possibly may be. Heretofore the cylinders have been constructed with a single stuffing-box on the head of one cylinder, having a tube surrounding the piston-rod extending from the other head through the gland and into the stuffing-box of the other head, so that the one stuffing-box would serve as the stuffing-box for both cylinder-heads; but in such construction the tube has necessarily been made fast to one head, and so that the gland of the stuffing-box of the other head may move longitudinally on the said tube in the adjustment of the gland, and the tube is necessarily in position when the packing is applied. For the introduction of the tube and the adjustment of the gland a considerable space is necessary between the two heads.

The object of my invention is to rigidly attach the tube to the gland of the stuffing-box, whereby the tube may be applied after the introduction of the packing and with the gland.

To this end the invention consists in a stuffing-box formed on the head of the smaller cylinder. A tube rigidly attached to or made as a part of the gland of the stuffing-box and extending toward the head of the other cylin-

der is yieldingly connected to that head, so as to permit the expansion and contraction of the tube, as more fully hereinafter described.

In illustrating the invention I show it as applied to a compound engine, A representing the larger cylinder, and B the smaller cylinder, the two cylinders being connected by webs C C in the usual manner.

D represents the piston-rod running centrally through both cylinders and common to both, as in the usual construction of such machines.

E represents the head of the smaller cylinder, which is adapted to be applied to the end of the cylinder in the usual manner.

It will be observed that the webs C, by which the two cylinders are connected, are of so small extent as to leave a considerable opening between them, through which the space between the cylinders may be reached for the introduction or adjustment of the screws or parts, as hereinafter described.

F represents the cylinder-head of the other cylinder, but is applied from the inside of the cylinder A—that is, is introduced from the opposite end and passed through the cylinder—and when in place it is secured by bolts G, introduced through a flange on the outside, as clearly seen in Fig. 1, the opening through the flange H being at least as large as the extreme size of the head E of the cylinder B, so that the head E of the cylinder B may be introduced through the main cylinder A, thence through the opening in the flange H to its place against the end of its cylinder, and then the head F of the cylinder A may be introduced from the same end of the cylinder A, brought to its place, and secured.

I represents the stuffing-box, which is formed on the outer side of the head E in the usual manner of constructing stuffing-boxes. With this box is combined the gland J, adapted to enter the stuffing-box and be secured or adjusted by means of bolts K through a flange L or in any of the usual constructions for applying and adjusting the gland.

M represents the packing in the box around the piston, as usual in such stuffing-boxes.

To the gland J a tube N is attached, this tube corresponding in diameter substantially to the diameter of the piston and so as to

inclose the piston. This tube is made fast to the gland J, so as to become substantially a part of it. The tube N extends to the head F and is connected thereto, so as to make a steam-tight connection between the tube and the head F, in order that no stuffing-box may be necessary for the head F. This connection, as here represented, is made by means of an elastic diaphragm O around the end of the tube next the head F, the outer edge of this diaphragm being secured to the head by means of a collar P or otherwise, so as to make a steam-tight joint. A limited amount of play is permitted the diaphragm. This may be done by forming a recess Q in the head and chamfering the inside of the collar P, as shown. This provision for the play of the diaphragm will permit the expansion or contraction of the tube as may be necessary for the adjustment of the gland—that is to say, the diaphragm will yield as the gland is forced closer to or drawn from the stuffing-box in the ordinary adjustment of that gland.

Instead of the diaphragm O, as described, the tube N may be annularly corrugated, as represented in Fig. 2.

The gland, tube, and head F are connected before being introduced to the cylinder A to be passed through that cylinder into their home positions.

The packing in the stuffing-box should be very near its proper adjustment when the gland is applied. I therefore prefer to use metal packing, R representing such metal packing for the cylinder-head F, and S the sheet-metal packing for the stuffing-box; but such packing is not essential to the invention.

On the larger class of engines or machines, instead of making the head F in a single piece with the tube N attached thereto, and which would necessitate the removal of the large head for the withdrawal of the gland for replenishing or examining the packing of the stuffing-box, the central portion of the head F may be made separate, as seen in Fig. 3, T representing such separate piece, this be-

ing a disk adapted to set and be secured upon the inside of the head F, with the tube connected thereto, and so that the detachment of the disk T from the head F will permit the gland of the stuffing-box to be withdrawn, the disk T moving with it substantially the same as will the head F in the first illustration.

The illustration of the invention as applied to compound engines will be sufficient to enable others skilled in the art to apply the invention to other machines employing "tandem" cylinders.

From the foregoing it will be understood that I do not claim, broadly, a tubular connection around the piston-rod between the stuffing-box of one cylinder and the head of the other cylinder; but

What I do claim is—

1. The combination of the two cylinders arranged in line with each other, a single piston-rod common to both cylinders, a stuffing-box on the head of one cylinder and between the cylinders, a gland for said stuffing-box surrounding said piston-rod, and a tube rigidly attached to said gland surrounding said piston and extending toward and positively connected to the corresponding head of the other cylinder, the said tube longitudinally yielding, substantially as described.

2. The combination of the two cylinders in line with each other, a single piston-rod common to both said cylinders, a stuffing-box on the head of one cylinder and between the cylinders, a gland for said stuffing-box surrounding the said piston-rod rigidly attached to the said gland and extending toward the corresponding head of the other cylinder, and a yielding diaphragm around the other end of said tube, the said diaphragm secured to the head of the other cylinder and whereby said tube is made longitudinally yielding, substantially as described.

EBENEZER HILL.

Witnesses:

HENRY B. PRICE,
ALFRED W. BETTS.