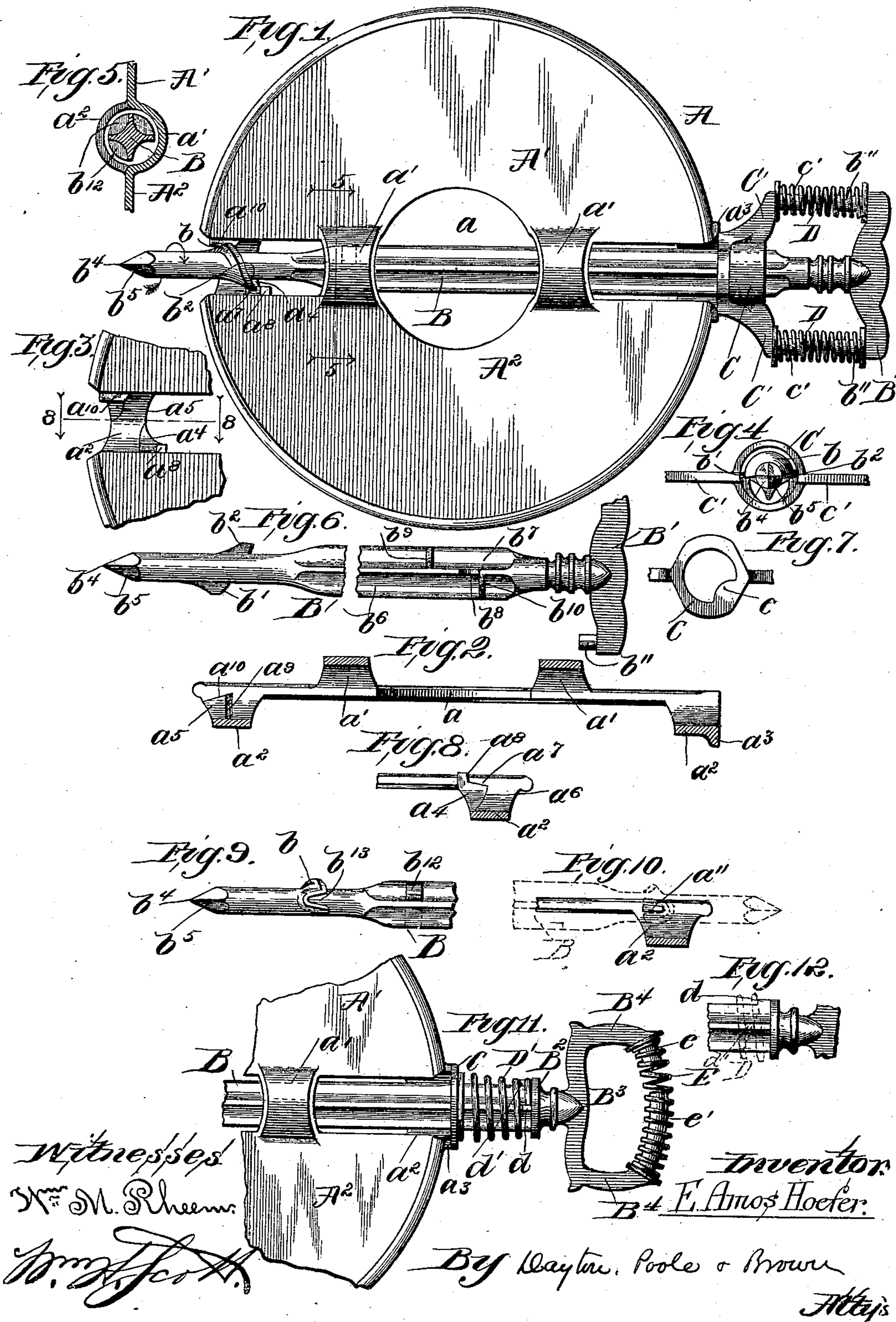


(No Model.)

E. A. HOEFER.
STOVEPIPE DAMPER.

No. 471,718.

Patented Mar. 29, 1892.



UNITED STATES PATENT OFFICE.

EMIL AMOS HOEFER, OF FREEPORT, ILLINOIS, ASSIGNOR TO THE WARNER MANUFACTURING COMPANY, OF SAME PLACE.

STOVEPIPE-DAMPER.

SPECIFICATION forming part of Letters Patent No. 471,718, dated March 29, 1892.

Application filed August 10, 1891. Serial No. 402,205. (No model.)

To all whom it may concern:

Be it known that I, EMIL AMOS HOEFER, of Freeport, in the county of Stephenson and State of Illinois, have invented certain new and
5 useful Improvements in Stovepipe-Dampers; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked
10 thereon, which form a part of this specification.

This invention relates to stovepipe-dampers, and more particularly to that class in which the damper is composed of a blade and a separable spindle, whereby the blade may
15 be first placed in position within the pipe and the spindle then passed diametrically through the pipe from the outside thereof and connected with the blade, so as to support and turn this latter.

20 The chief objects of the present invention are, first, to provide means for readily connecting the spindle and blade and for automatically locking the two parts together; second, to provide means for preventing the
25 guard or sleeve on the spindle from becoming too easily disengaged therefrom when the spindle is detached; third, to provide means whereby the spindle may itself form its own bearing-apertures in the stove-pipe; fourth,
30 to provide a non-conducting handle of simple and effective construction.

To these and other ends the invention consists in certain novel features, which will first be described, and will then be specifically
35 pointed out in the appended claims.

In the accompanying drawings, Figure 1 is a plan view of a damper embodying the invention in one form. Fig. 2 is a central transverse sectional view of the blade detached.
40 Fig. 3 is a detail plan view of a portion of the blade. Fig. 4 is a detail end elevation of the damper. Fig. 5 is a detail sectional view taken on the line 5 5 of Fig. 1. Fig. 6 is a view of the spindle detached and viewed from the opposite side from Fig. 1. Fig. 7 is a detail end elevation of the sleeve or guard.
45 Fig. 8 is a detail sectional view taken on the line 8 8 of Fig. 3. Fig. 9 is a detail view of one end of the spindle, illustrating a modified
50 form of the invention. Fig. 10 is a view

similar to Fig. 8, showing the blade as modified to receive the form of spindle shown in Fig. 9, the said spindle being indicated in dotted lines. Fig. 11 is a plan view of a modified form of the invention. Fig. 12 is an elevation of a portion of Fig. 11.

In the said drawings, A represents the blade of the damper, which is preferably constructed of thin cast-iron in the form of a disk, and which is provided with a central opening a .
60 The said blade has two equal semicircular parts A' A^2 , having a space between them to receive the spindle B, the said parts being connected by bridge-pieces or half-sleeves a' a^2 . The two half-sleeves a' are located on
65 one side of the blade, one at each side of the central opening a , while the two half-sleeves a^2 are located one at each end of the blade at the margin thereof. These half-sleeves span the space between the parts A' and A^2 of
70 the damper, and form in connection with said space a sleeve into which the spindle B may be inserted. One of the end half-sleeves a^2 is preferably provided with a projecting semi-hub a^3 to bear against the inner
75 side of the stovepipe. The other one of the half-sleeves a^2 is provided on its inner face with two diagonally-opposite lugs a^4 and a^5 . The lug a^4 is provided with a spirally-inclined edge or face a^6 , adjoining which is a
80 straight edge or face a^7 , terminating in a stop a^8 . The lug a^5 is provided with an inclined edge or face a^9 opposite the face a^6 of the lug a^4 , and with an edge or face a^{10} adjacent thereto and parallel with the face a^7 of the lug a^4 .
85 The faces a^7 and a^{10} may be parallel with the axis of the spindle when inserted, but are preferably slightly inclined thereto in the manner shown, for the reasons hereinafter pointed out.

The spindle B may be constructed in any suitable manner so far as its body portion is concerned; but it preferably has the quadrangular grooved body shown, the end portion thereof near the point end being reduced
95 in diameter and cylindrical in form and provided with a spiral rib or thread b , extending around one-half of its circumference. This rib or thread has its ends b' b^2 enlarged or extended parallel with the axis of the spindle
100

some little distance, as shown in Fig. 6. The extreme end of the cylindrical portion of the spindle is beveled off, as shown, to form a sharp point b^4 , provided with knife-edges b^5 for the purpose of enabling the spindle to be forced through the sheet metal of which the stovepipe is constructed, and thus form its own bearing-apertures.

C indicates a sleeve or guard mounted loosely on the spindle, and free, when in position, to move longitudinally thereon within a limited range. This sleeve is provided with an inwardly-projecting lug c , which is adapted to engage the grooves of the body of the spindle B. One of these grooves, as b^6 , is continuous from the reduced point section of the spindle to the point where the sleeve is located when in proper position, and the adjacent groove b^7 is connected therewith by a notch b^8 , formed transversely through the intermediate rib of the spindle. The groove b^7 is provided with a transverse stop b^9 , located some little distance pointward from the notch b^8 , while the groove b^6 is desirably provided with a stop b^{10} , arranged in line with that edge of the slot b^8 which is nearest the handle of the spindle.

The spindle B is provided at its end opposite the point end with a transverse handle-bar or arm B' , having at each end a stud b^{11} , extending toward the blade. The sleeve C is provided with corresponding lateral arms C' , each provided with a stud c' , extending toward the corresponding stud b^{11} . Springs D, spirally coiled, located between arms B' and C' and supported by the studs thereon, tend to force the sleeve-studs C normally toward the blade A. When the spindle has the grooved form shown, it will be provided, as shown in Fig. 5 and in dotted lines in Fig. 1, with an annulus b^{12} , surrounding that portion of its body which comes within the half-sleeve a' of the blade nearest the point end when the parts are engaged, this annulus being, of course, cut away or omitted at that portion of the spindle wherein the groove b^6 is located, as will be seen in Fig. 5.

The device thus constructed operates in the following manner: The sleeve C is slipped on over the point of the spindle and slid along the body portion of the same with its lug c in the groove b^6 thereof. When the lug c comes in contact with the stop b^{10} , it is opposite the notch b^8 , and the sleeve C being given a quarter-turn the said lug c passes through said notch b^8 and engages the groove b^7 . The arms C' of the sleeve are now parallel with the handle-bar or arm B' and the springs D are compressed and slipped into position over the studs b^{11} c' in the position shown. These springs will force the sleeve C pointward until the lug c thereof comes into contact with the stop b^9 and will hold said sleeve stationary against said stop, and thus prevent its sliding or dropping off of the spindle before the same is connected with the blade. I

prefer to so proportion the parts that the limit of compression of the springs D will be such that the sleeve C cannot be moved far enough toward the handle-bar B' to bring the lug c opposite the notch b^8 , the sleeve being thus prevented from rotating on the spindle while the said springs are in position by reason of the engagement of its lug c with the groove b^7 . The blade A is then placed in position in the stovepipe and the spindle B forced or driven through the wall of the pipe, cutting its way by means of its knife-edged sharpened point b^4 , and inserted into the space between the parts A' A^2 of the blade and the half-sleeves a' a^2 thereof until the spiral rib or thread b of the spindle comes in contact with one or both of the lugs a^4 a^5 of the half-sleeve a^2 . The spindle is then rotated until the rib b engages with the inclined edge or face a^6 of the lug a^4 , being forced inward, if necessary, so as to effect this engagement, the said rib coming into contact with the inclined surface or edge a^9 of the lug a^5 , if so forced inward, thereby preventing its being forced too far inward. When the rib is once engaged with the incline a^6 of the lug a^5 , mere rotation of the spindle in the proper direction is all that is necessary to gradually draw the spindle inward toward its final position. When the end b^2 of the rib b passes off or clear of the end of the incline a^6 , the springs D, which have in the meanwhile been compressed by reason of the contact of the sleeve C with the outside of the stovepipe, will draw the spindle outward, the end a^2 of the rib b passing along the edge or surface a^7 of the lug a^4 . At the same time the end b' of the rib b comes into contact with the surface or the edge a^{10} of the lug a^5 and acts as a stop to prevent further rotation of the spindle in the blade in one direction, while the contact of the end b^2 of said rib with the edge a^7 of the lug a^4 prevents its rotation in the other direction. The faces or edges a^7 a^{10} of the lugs a^4 a^5 are preferably somewhat inclined, as shown, to the axis of rotation of the spindle, so that as the springs D draw the spindle outward the spindle is wedged between said lugs a^4 a^5 and the other half-sleeves in the blade. This wedging action may or may not occur before the end b^2 of the rib b comes in contact with the stop a^8 , and in the latter case the said stop arrests the further outward movement of the spindle, which might disengage it from the blade. In case the edges a^7 a^{10} are not inclined, as described and shown, this stop will always arrest the outward movement of the spindle at the proper point and hold the same locked to the blade. The annulus b^{12} forms a smooth continuous bearing-surface for the spindle within the half-sleeve a' during its rotation. The wall of the stovepipe will of course be clamped between the sleeve C and the semi-hub or collar a^3 of the other half-sleeve a^2 when the parts are in final position. The spindle

and blade being thus locked together in the manner described rotation of the spindle by means of its handle, which is outside of the stovepipe, will turn the blade within the pipe to the desired position. The parts may be disengaged by forcing the spindle inward until the rib thereof clears the lug a^4 and then turning said spindle in the reverse direction until it can be withdrawn.

While the form of my invention shown in Figs. 1 to 8, inclusive, and just described, is one which I prefer, yet it is obvious that the construction may be modified in various ways and that several of the desirable but not strictly necessary features thereof may be omitted without departing from the principle of my invention. For instance, I have shown in Figs. 9 and 10 a modified form of the connecting means between the spindle and the blade, in which the half-sleeve a^2 is provided with a simple projection a^{11} , while the rib b is provided with a notch or recess b^{13} , into which the projection a^{11} fits when the spindle is drawn back by its spring upon complete engagement. It is also obvious that by a mere reversal the male member of the screw connection may be on the blade and the female member on the spindle.

The particular manner of interposing the spring or springs between the sleeve and spindle-head (shown in Fig. 1) may also be varied in many ways, and in Figs. 11 and 12 there is illustrated a modification of this feature, in which the sleeve C on the spindle has the shape of a simple apertured disk or washer, and the spindle B is provided with a collar B^2 , between which and the sleeve C there is interposed a spring D' , coiled around the spindle, which latter is provided with a stop d for the end of the spring and a retaining-lug d' , between which and the collar B^2 the spring D' passes and is held so as to prevent its dropping off of the spindle when this latter is separated from the blade.

In Fig. 11 I have also shown a handle which I have devised, in which a cross-bar B^3 at the end of the spindle is provided with outwardly-extending parallel arms B^4 , which arms are respectively provided with a short stud e and a long arm e' , both circular in cross-section and curved as shown, a sufficient space being left between the arm and stud at one side of the handle to permit a coiled spring E to be slipped first over the arm e' by bending the same laterally, so as to clear the stud e , and then compressing the said spring sufficiently to slip it over said stud. This structure affords a firm and cool finger-grasp for turning the damper. The springs D (shown in Fig. 1) also afford a cool hand-grasp in addition to serving as springs to force the sleeve toward the point of the spindle. The extended ends b' b^2 of the rib b also form knife-edges, which help the spindle to cut a way through the pipe for the enlarged body portion thereof.

What I claim is—

1. The stovepipe-damper comprising a blade or damper proper and a separable spindle, a spring adapted to draw the spindle outwardly from engagement with said blade, female half-threads on the blade and male half-threads on the spindle, adapted for engagement when the spring is compressed, and a stop on the blade, substantially as described.

2. In a stovepipe-damper, the combination, with a blade provided with a bearing-lug and a stop-lug, of a spindle provided with a spiral rib or thread around one-half its circumference, said rib or thread being adapted to bear on the bearing-lug and having ends to contact with the stop-lug and bearing-lug, and a spring to draw the spindle outward when the rib has passed clear of the bearing-lug, substantially as described.

3. In a stovepipe-damper, the combination, with the damper having half-sleeves on opposite sides, one provided with lugs having parallel stop-faces inclined to the axis of the spindle, of a spindle provided with a spiral rib having ends adapted to bear on said inclined stop-faces, and a spring to draw said spindle outward, substantially as described.

4. In a stovepipe-damper, the combination, with a blade having lug a^4 , with inclined faces a^6 a^7 and stop a^8 , and lug a^5 , with inclined faces a^9 a^{10} , of a spindle provided with a spiral rib b , having stop-ends b' b^2 , substantially as described.

5. In a stovepipe-damper, the combination, with a blade and a spindle adapted to be connected therewith and provided with a continuous groove, a parallel groove having an end stop, and a communicating notch, of a sleeve on said spindle provided with a lug to enter the grooves and notch, and a spring or springs interposed between the sleeve and the spindle, substantially as described.

6. In a stovepipe-damper, the combination, with a blade, of a spindle separably connected therewith by screw-threads on the spindle engaging screw-threads on the blade, said spindle projecting from the blade to form a trunnion to engage the stovepipe and having its cylindric end portion beveled off to form knife-edges, which terminate in a single sharp point at the end of the spindle, as and for the purpose specified.

7. In a stovepipe-damper, the combination, with a blade having half-sleeves, one provided with connecting devices for the spindle, of a spindle adapted to engage said connecting devices when rotated and provided with an annulus to bear in the adjacent half-sleeve, substantially as described.

8. In a stovepipe-damper, the combination, with a spindle provided with a cross-bar having parallel arms, said arms having, respectively, a short stud and a long arm extending toward each other, with an intermediate space near one side, of a coiled spring adapted to be slipped over said stud, substantially as described.

9. In a stovepipe-damper, the combination,
with a sleeve, of a spindle provided with a
collar, a stop-lug, and a retaining-lug, and a
coiled spring mounted on said spindle be-
5 tween the sleeve and collar, passing between
the retaining-lug and collar and bearing at
its end against the stop-lug, substantially as
described.

In testimony that I claim the foregoing as
my invention I affix my signature in presence 10
of two witnesses.

EMIL AMOS HOEFER.

Witnesses:

F. W. HOEFER,
D. B. BREED.