

(No Model.)

4 Sheets—Sheet 1.

H. J. HOOTON & F. A. JONES.

DAMPER REGULATOR.

No. 305,311.

Patented Sept. 16, 1884.

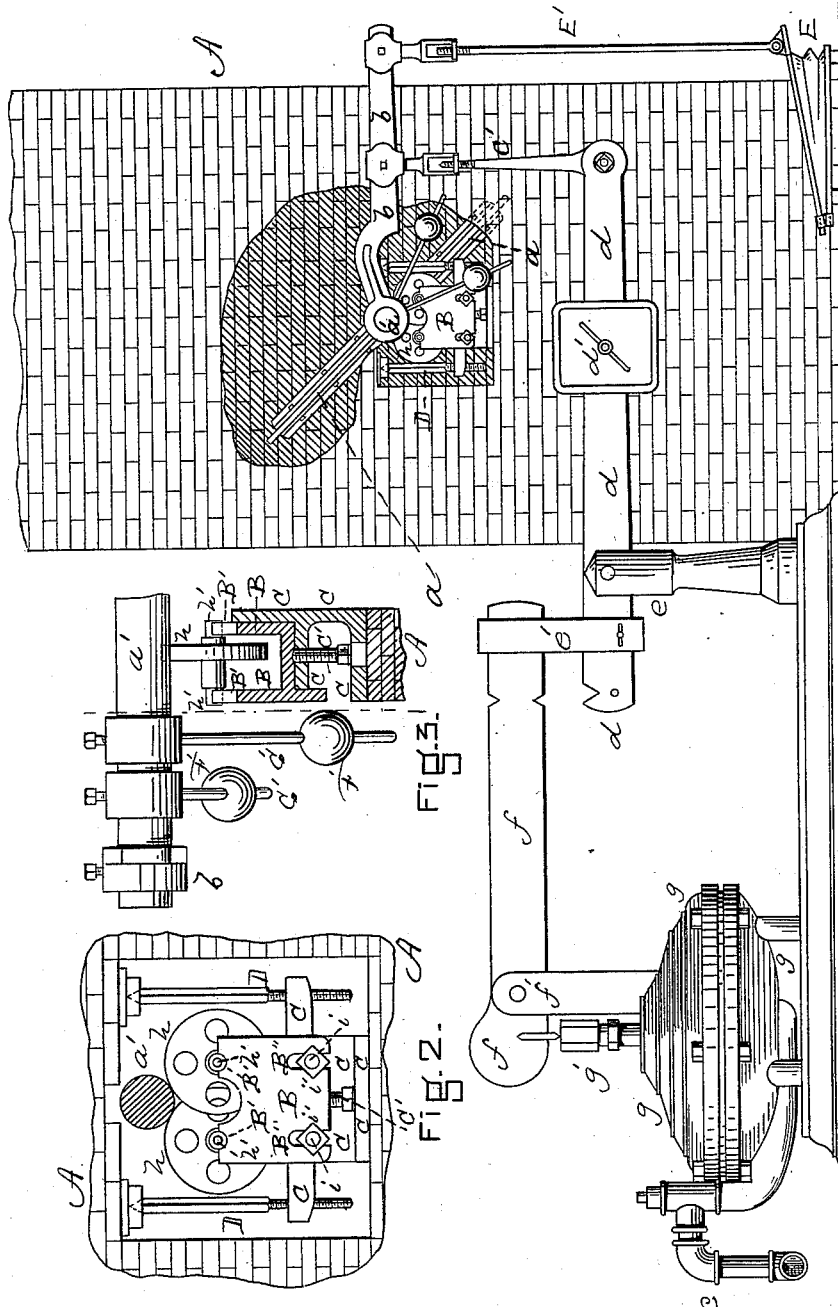


Fig. 1.

Fig. 2.

Fig. 3.

WITNESSES

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Florentine A. Jones
By their Atty.

INVENTORS

Henry W. Williams

(No Model.)

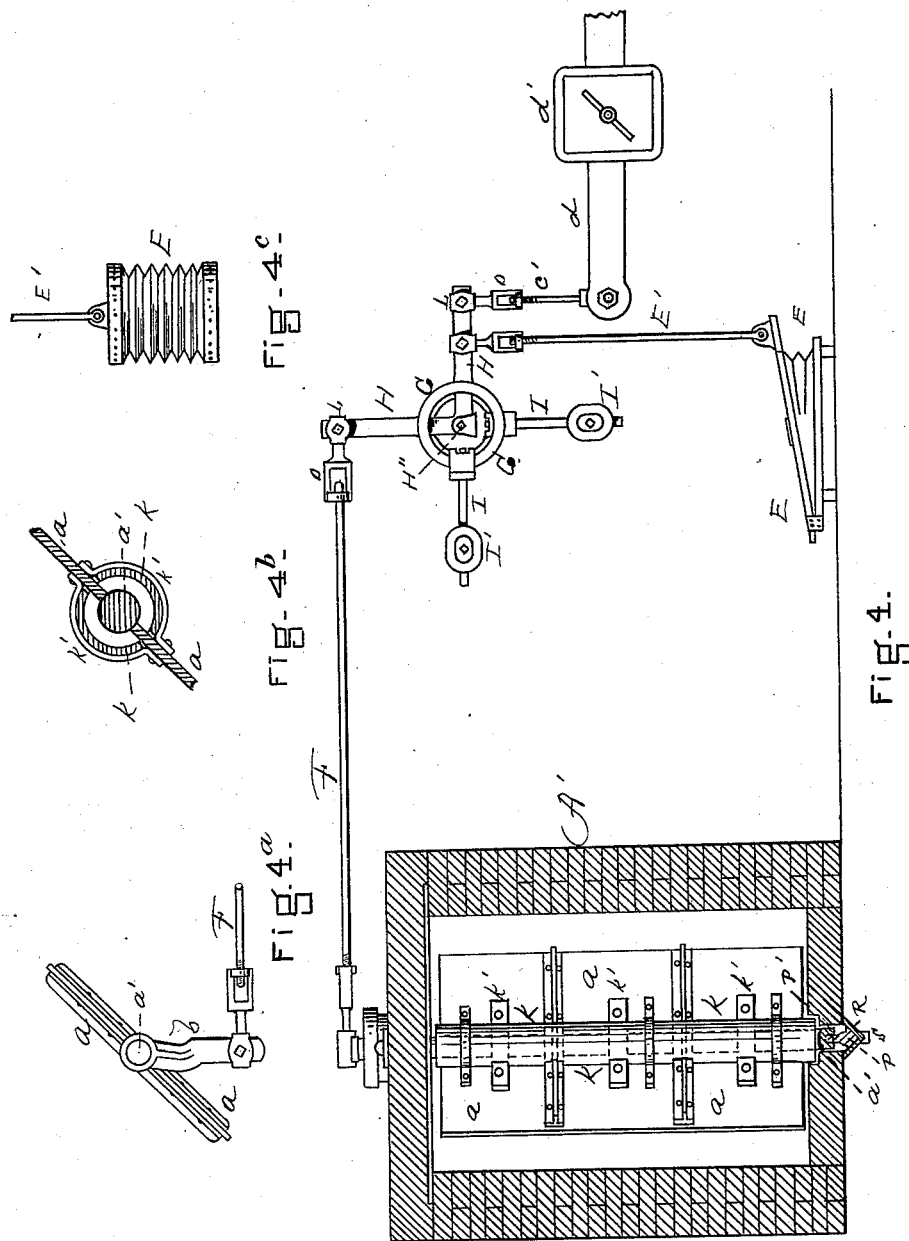
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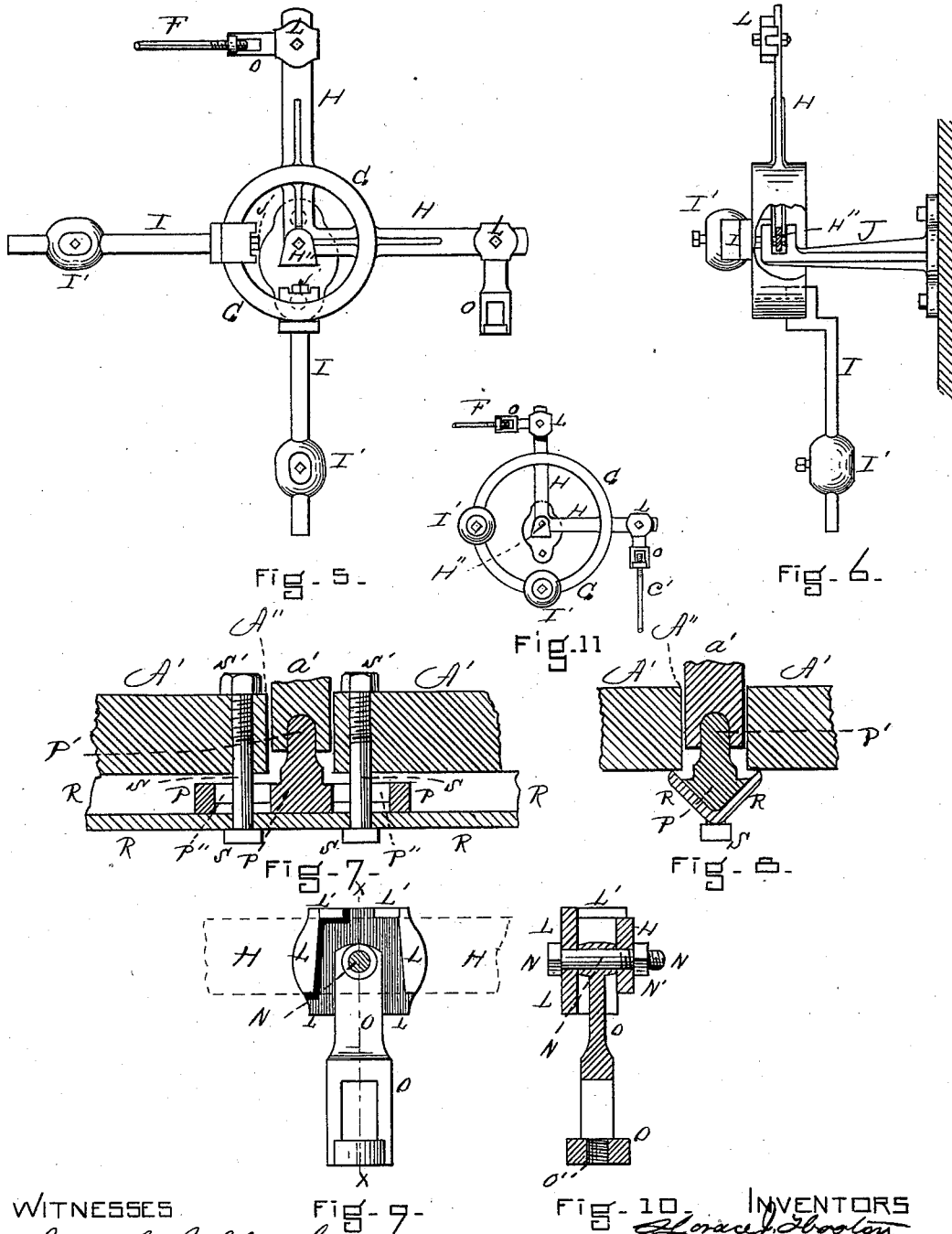
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WITNESSES

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FIG-10. INVENTORS

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(No Model.)

4 Sheets—Sheet 4.

H. J. HOOTON & F. A. JONES.

DAMPER REGULATOR.

No. 305,311. *A*

Patented Sept. 16, 1884.

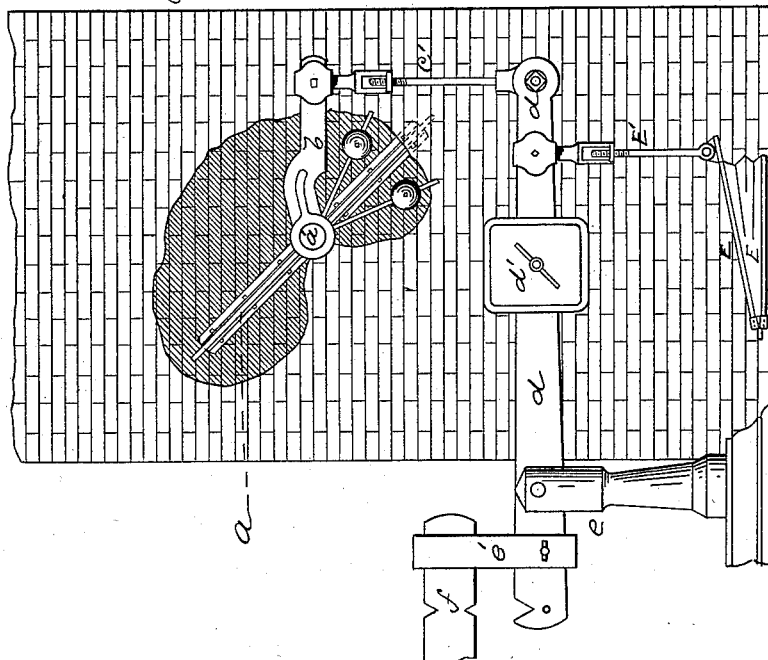


Fig. 12.

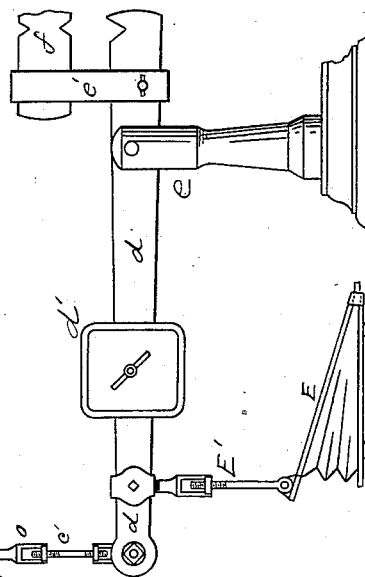
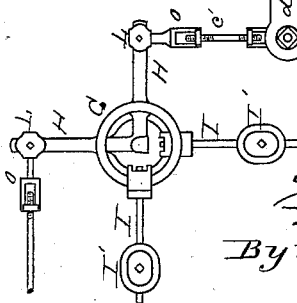


Fig. 13.

WITNESSES

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UNITED STATES PATENT OFFICE.

HORACE J. HOOTON, OF BOSTON, MASSACHUSETTS, AND FLORENTINE A. JONES, OF NEW YORK, N. Y., ASSIGNORS TO THE AMERICAN STEAM APPLIANCE COMPANY, OF NEW YORK.

DAMPER-REGULATOR.

SPECIFICATION forming part of Letters Patent No. 305,311, dated September 16, 1884.

Application filed January 5, 1884. (No model.)

To all whom it may concern:

Be it known that we, HORACE J. HOOTON, of Boston, in the county of Suffolk and State of Massachusetts, and FLORENTINE A. JONES, of the city, county, and State of New York, have invented new and useful Improvements in Damper-Regulators, of which the following is a specification.

This invention relates to certain improvements in dampers and damper-regulators, and the means for controlling the former more particularly, but not exclusively, in connection with steam-boiler furnaces, the nature of such invention being fully described below, and illustrated in the accompanying drawings, in which—

Figure 1 is an elevation showing a portion of a chimney broken out to better illustrate the invention and our damper-regulator and its necessary connections. Fig. 2 is an enlarged elevation in detail of certain connections supporting the damper-shaft, which is shown in section. Fig. 3 is a part side elevation and part vertical section, showing the damper-shaft, its counterpoise as usually constructed, &c. Fig. 4 is a vertical section of a horizontal flue, with a view of the damper and regulating connections in elevation. Fig. 4^a is a plan of the upper end of the damper and its immediate connections. Fig. 4^b is a horizontal or cross section of the damper. Fig. 4^c is an elevation showing a different style of bellows from that shown in Figs. 1 and 4 and its immediate connection. Fig. 5 is an enlarged detached elevation of the counterpoising mechanism. Fig. 6 is a side elevation of the same, a small portion being represented as broken out. Fig. 7 is an enlarged vertical section of a portion of the under wall of the horizontal flue shown in Fig. 4, showing the support for the damper-shaft. Fig. 8 is an enlarged vertical section of the same, taken at right angles to that shown in Fig. 7. Fig. 9 is an enlarged rear elevation of the device connecting the rod F and bell-crank H. Fig. 10 is a vertical section of the same on line *x*, Fig. 9. Fig. 11 is an elevation of a modification of the counterbalancing mechanism. Fig. 12 is

an elevation of a modification. Fig. 13 is an elevation of a further modification.

Similar letters of reference indicate corresponding parts.

A represents a chimney or flue; *a*, a damper therein, rigid on its shaft *a'*, which is rigidly connected with the crank *b*, to which is adjustably connected the rod *c'*, pivoted to the lever *d*, weighted at *d'*. The lever *d* is fulcrumed at *e*, and connected by a link, *e'*, to the lever *f*, fulcrumed at *f'*, and given motion by the rod *g'*, extending into the steam-chamber *g*, provided with the usual diaphragm, and with steam from the boiler through the pipe *c*.

All the above parts are well known, and are constructed and operated in the usual manner, and hence require no further explanation, it being understood that the steam from the boiler passing into the steam-chamber, by means of the intermediate mechanism above named, operates the damper in order to regulate the draft.

The damper-shaft *a'* is supported on the wheels *h*, (not new in themselves considered,) whose axles *h'* bear in depressions *B'* in the carriage *B*, slotted at *B''*, and secured by means of the bolts *i* and nuts *i'* to the frame *C*, of the shape shown in Figs. 2 and 3. Screws *D* extend through the frame *C* up against the masonry in the chimney, which is slightly chambered out for the purpose, thus enabling the frame to be made rigid and secure therein, and a screw, *C'*, bearing against the under side of the carriage *B*, renders it vertically adjustable, while it is secured by the nuts *i'* in the slots *B''*.

Adjustably connected to the crank *b* is a rod, *E'*, whose lower end is secured loosely to a bellows, *E*. This bellows has a small aperture, which lets out or in the air slowly, and is usually of the ordinary kind shown in Figs. 1, 4, and 12; but it may be of the style shown in Fig. 4^c, or of any ordinary description. Its office is to provide a cushion of air, whereby the sudden vibration or jar of the damper, caused by sudden drafts, currents, or gusts of air in the chimney or flue, may be gently

checked in a noiseless manner. The bellows-connection E' may be secured, if desired, to an independent damper-crank, or to the elbow, as in Fig. 4, or to the lever d, as in Figs. 12 and 13, or to any part of the mechanism at any point practicable to produce the desired effect.

In Fig. 4, A' represents a horizontal flue, the damper-shaft being of course vertical.

In order to protect the damper-shaft a' from the intense heat, we provide a casing or semi-tube, k, on each side, secured to the damper a in the manner shown in Figs. 4 and 4', so as to leave an air-space between the casing and the damper-shaft. The casing is secured to the damper preferably by the clamps k'.

F is a rod adjustably secured to the damper-shaft crank b and the bell-crank lever H, which is pivoted at H'' to a bracket, J, Fig. 6, secured to the wall. Rigidly secured to this bell-crank (see Figs. 4, 5, 6) is a ring, G, which is provided with radial arms I, adapted to be slid around to any point thereon, or secured to or removed therefrom by means of the set-screws j, and provided with sliding weights I'. The ring G and levers or arms I take the place of the ordinary device, F' G', (shown in Fig. 3,) being more efficient, convenient, and more readily adjusted.

In the modification shown in Fig. 11 the weights I' slide on the ring G, instead of on bars radiating therefrom; but we prefer the counterpoise shown in Figs. 4, 5, 6.

The connection between the bell-crank and the rod F is as follows, and is shown in Figs. 9 and 10 in detail: A box, L, is held onto the bell-crank H by a bolt, N, and nut N'. It is kept from relative movement by its flange L', resting on the edge of the bell-crank. An adjustable connecting-piece, O, provided with the threaded perforation O', receives the end of the rod F. The connections between the bell-crank and rods c' and E' are similar, as are also several of the connections shown in these drawings.

In order to protect the pivot upon which the damper turns, (see Figs. 4, 7, and 8,) and to render said damper adjustable both vertically and horizontally, we extend the damper-shaft a' down into an opening, A'', in the masonry A', where it lies over a pivot, P', whose highest point is below the surface of the masonry. The pivot P' is integral with or secured to the sliding base P, slotted longitudinally at P'', and fitting into the trough R of angle-iron. The trough R is held in position by bolts S and nuts S', said bolts passing through the slots P'' in the base P, thus rendering said base and pivot adjustable longitudinally.

An important advantage attained by the slots is the admission of cool air to the pivot, thus aiding in preventing it from becoming overheated.

In the modifications shown in Figs. 12 and 13 the bellows is connected with the regulator-arm d, and in the latter modification the

counterpoise mechanism is connected by the rod c' with the same arm.

We are aware that a dash-pot has been used in connection with a damper-regulator, the difficulty with which is, that great power is required to start it or set it in motion, and that when in motion it yields gradually and slowly.

By using a bellows instead of a dash-pot, especially in connection with large chimneys provided with dampers of great area, where the force of the wind is exceedingly strong, and where it is desirable that the damper may yield slightly to sudden and violent or even moderate gusts, but little power is necessary to produce a slight movement, while an extensive movement is effectually prevented.

Both the bellows and the counterpoise mechanism may be applied at any convenient point between the damper and the steam-chamber; or the bellows may connect directly with the damper.

The ring G may either be integral with or rigidly secured to the elbow-lever H; or it may not be entire, but a sufficient portion—an arc—to accomplish the purpose.

The casing k may extend beyond the edge of the damper into the wall sufficiently to keep the heat from the shaft, if desired, as shown in Fig. 4, and may be of any convenient shape in cross-section.

Having thus fully described our invention, what we claim, and desire to secure by Letters Patent, is—

1. A damper-regulator provided with a bellows, said bellows being applied to or connected with said regulator at any suitable point, for the purpose set forth.

2. In a damper-regulator, the combination, with the damper a, damper-shaft a', and crank b, of the connecting-rod E' and bellows E, substantially as and for the purpose described.

3. In a damper-regulator, a counterpoise or counter-balance consisting, substantially, of an elbow or bell-crank lever, to which is rigidly secured or with which is integral a portion or the whole of a ring adapted to receive weights or weighted arms, substantially as and for the purpose set forth.

4. In a damper-regulator, the combination, with the elbow-lever H, of the ring G, rigid therewith and provided with the removable weighted arms I I', substantially as and for the purpose described.

5. The herein-described damper-shaft bearing, consisting, essentially, of the following parts, viz: the wheels h, carriage B, provided with the depressions B' and slots B'', and frame C, provided with the set-screw C', and bolts i and D, constructed and arranged substantially as and for the purpose set forth.

6. The damper-shaft a', extending into the recess A'', in combination with a pivot entirely below or behind the inner surface of the flue, substantially as and for the purpose described.

7. The combination of the damper-shaft a'

and masonry A', the pivot P', and base P, provided with the slots P'', the angle-iron R, and the bolts S, all substantially as and for the purpose set forth.

5 8. The combination of the box L, provided with the flanges L', the pivot N, and the swinging piece O, constructed and arranged substantially as and for the purpose described.

10 9. The combination, with the damper a and shaft a', of the collar or casing k, substantially as and for the purpose set forth.

10. A damper-shaft consisting, essentially, of the wheels h and a supporting mechanism

held firmly in place by the screws D, extending upward against the masonry, and thereby 15 pressing the supporting mechanism downward against said masonry, substantially as and for the purpose described.

11. The combination, with a damper, of a bellows suitably arranged in connection there- 20 with, for the purpose set forth.

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