(No Model.) 4 Sheets—Sheet 1.

W. H. DOANE.

DUPLEX PLANING MACHINE.

No. 365,507. Patented June 28, 1887.

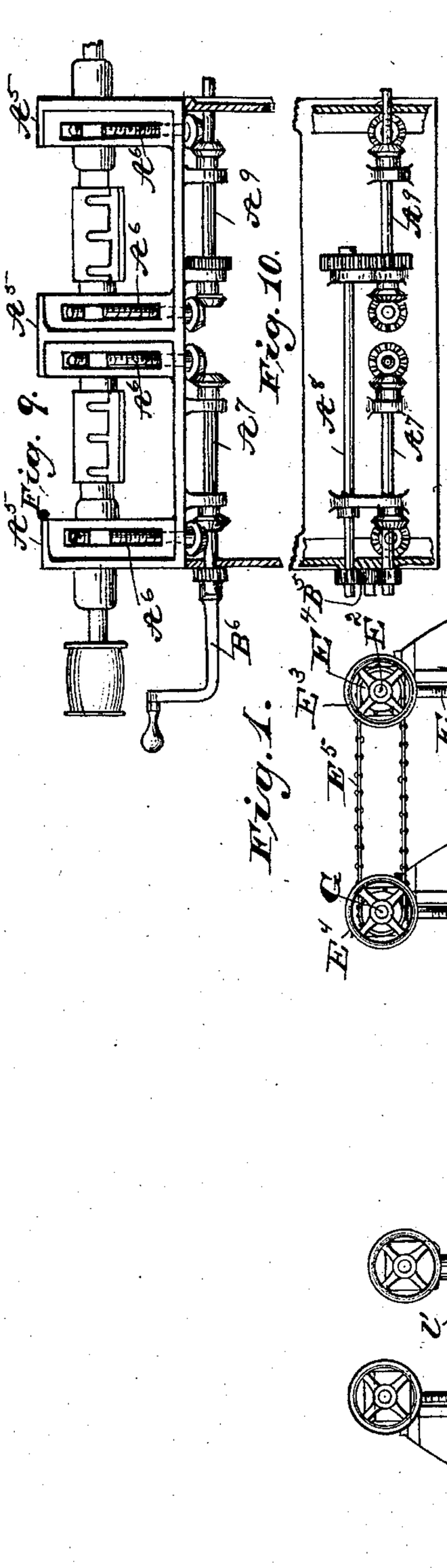

Fig. 9.

Fig. 10.

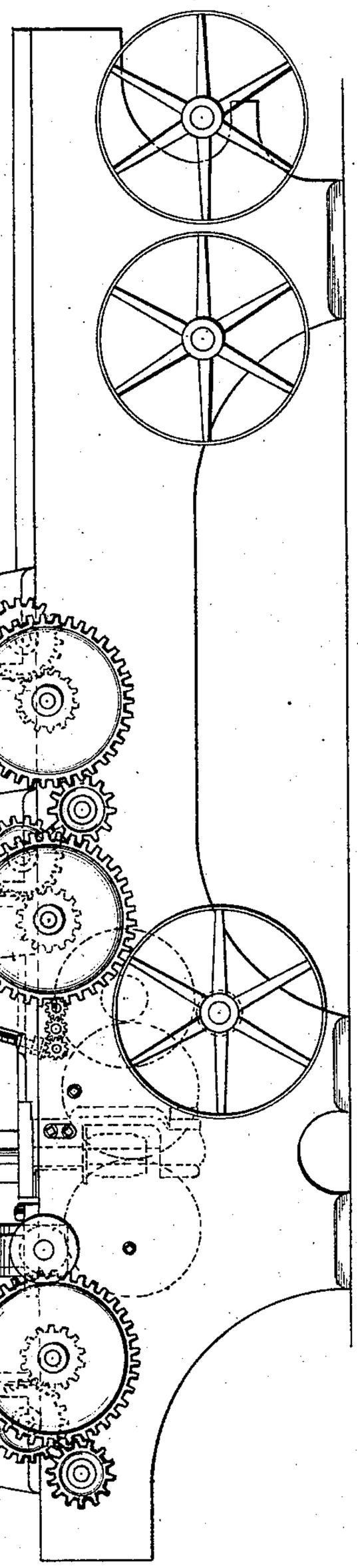

Fig. 1.

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W. H. DOANE.

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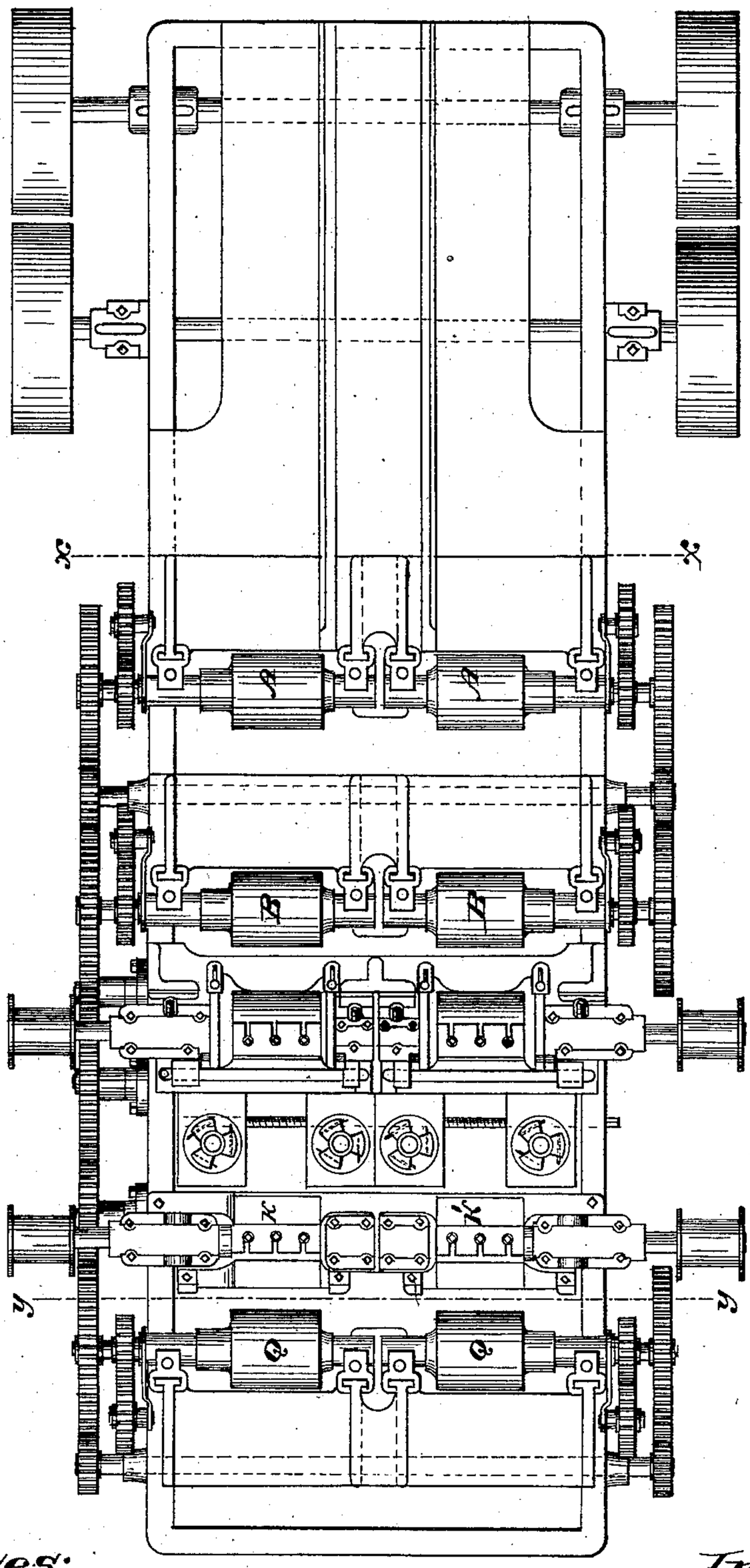

Fig. 2.

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(No Model.) 4 Sheets—Sheet 3.

W. H. DOANE.

DUPLEX PLANING MACHINE.

No. 365,507. Patented June 28, 1887.

Fig. 3.

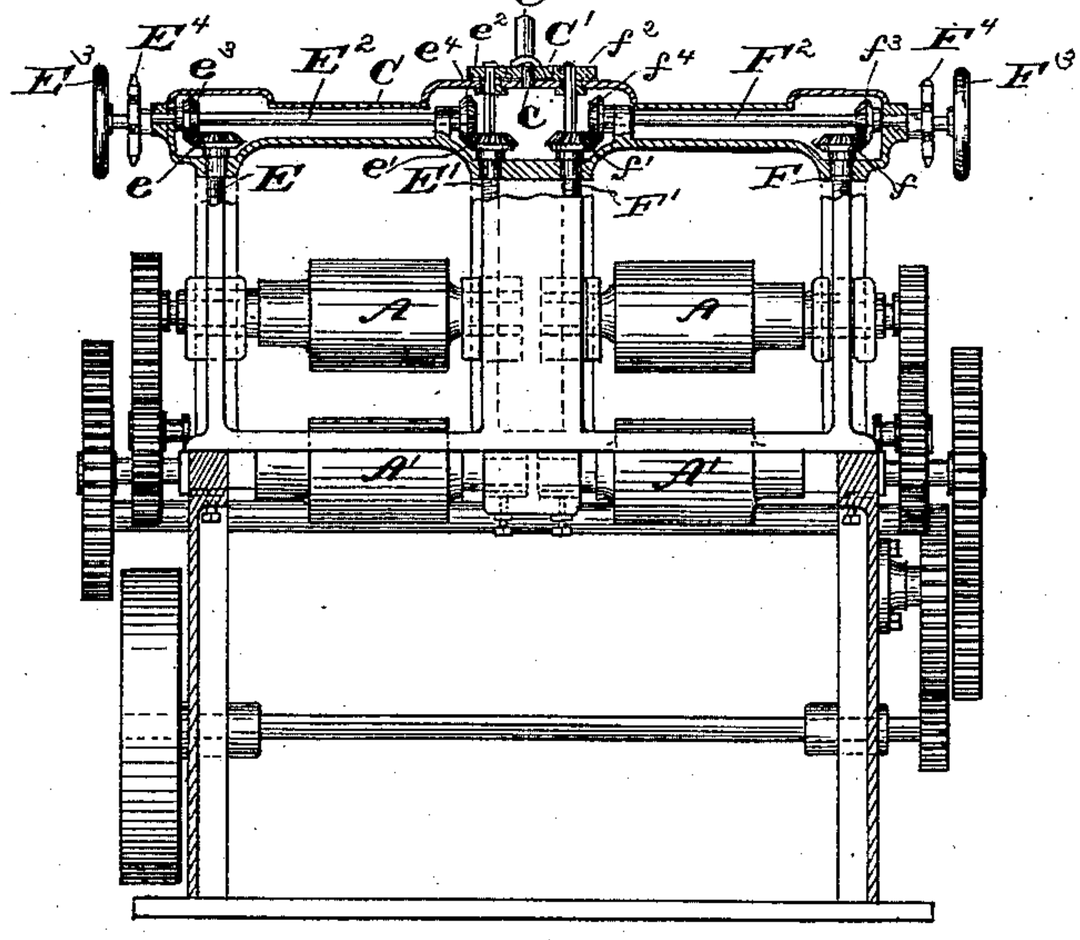
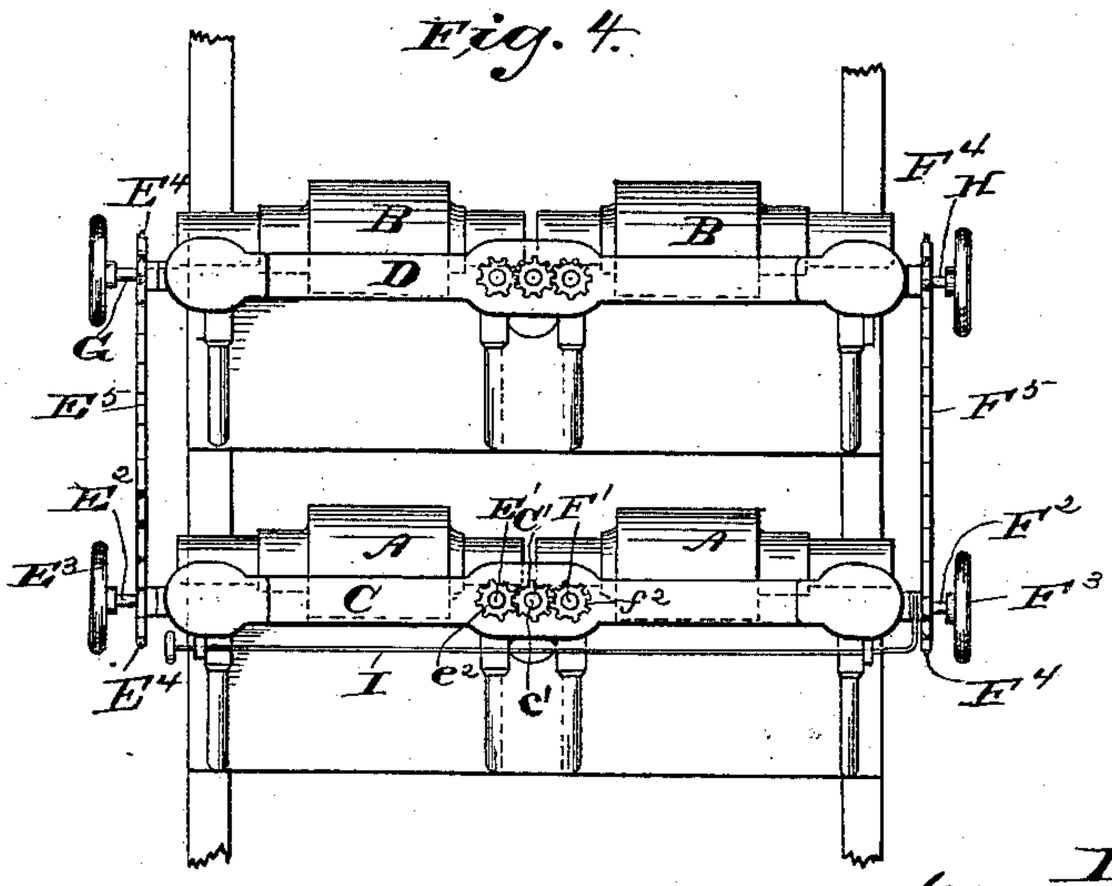


Fig. 4.



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(No Model.) 4 Sheets—Sheet 4.

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DUPLEX PLANING MACHINE.

No. 365,507. Patented June 28, 1887.

Fig. 5.

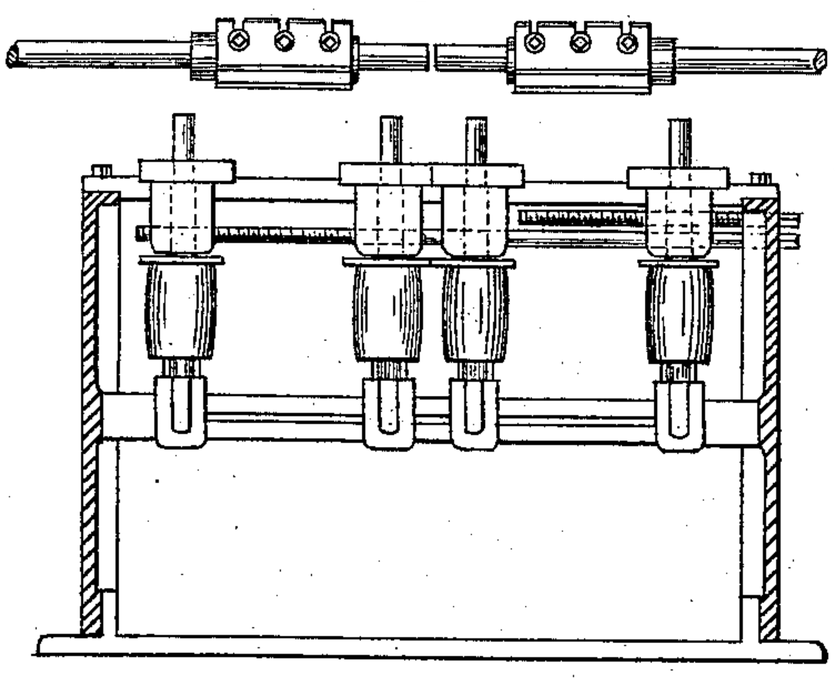


Fig. 7

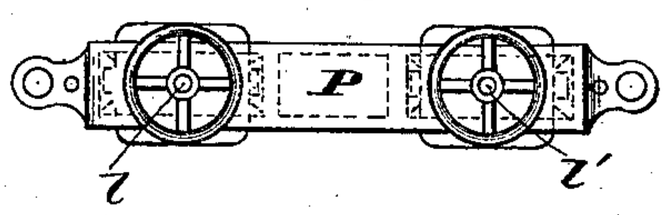


Fig. 8.

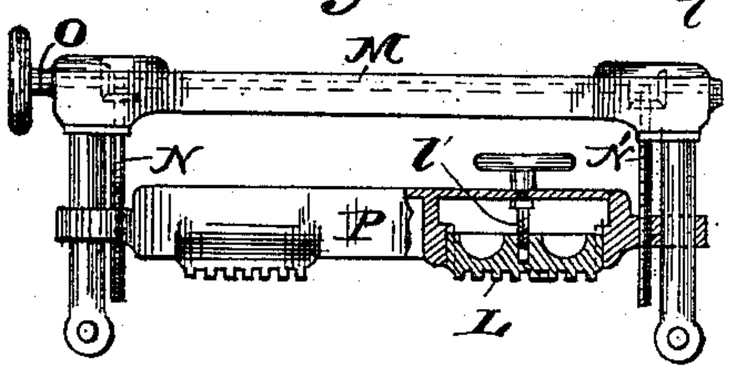
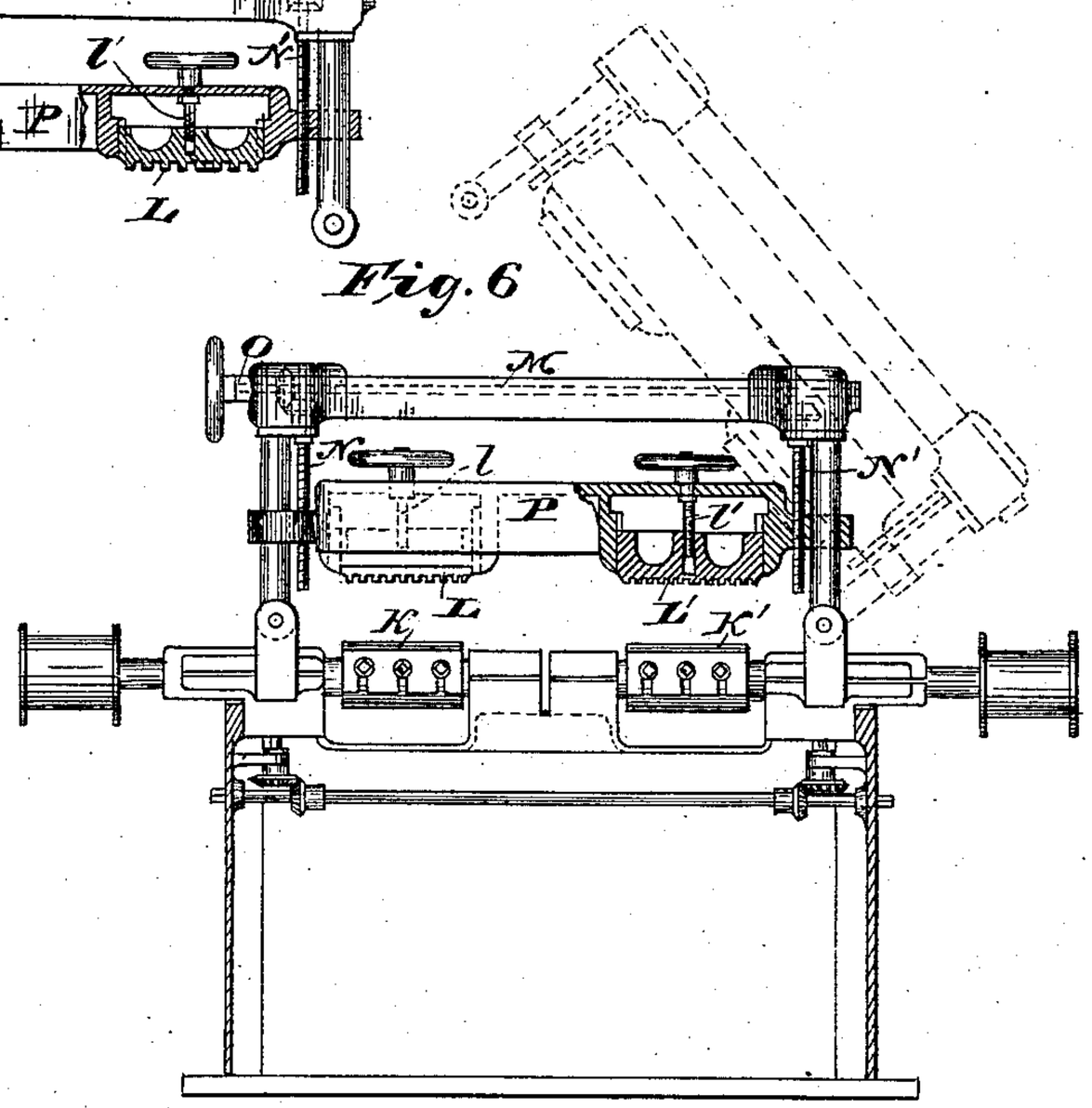


Fig. 6



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Inventor:
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UNITED STATES PATENT OFFICE.

WILLIAM H. DOANE, OF CINCINNATI, OHIO.

DUPLEX PLANING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 365,507, dated June 28, 1887.

Application filed April 15, 1886. Serial No. 198,971. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. DOANE, a citizen of the United States, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Duplex Planing-Machines; 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.

My invention is in the nature of an improvement upon the class of duplex planing and matching machines, an example of which is illustrated in my United States Patent No. 335,994; and its object is to enhance the efficiency of this style of machines.

My improvement consists of certain combinations, separately set forth by distinct claims at the close of this specification, designed to simplify the mechanism for adjusting the feed-rolls; also of the combination, with the lower planer-knives, of independently-adjustable pressure-bars.

In order that my invention may be clearly understood, I have illustrated in the annexed drawings, and will proceed to describe, a practical form thereof.

Figure 1 represents a side elevation of so much of a duplex planing and matching machine as suffices to illustrate the embodiment of my invention. Fig. 2 represents a plan view of the same, from which the mechanism for adjusting the upper feeding-in rolls and upper feeding-out rolls, as well as the pressure-bars over the lower planing-cylinders, are omitted for the sake of clearness of illustration of the remaining parts. Fig. 3 represents a cross-section of the machine, taken in the plane indicated by the line X X on Fig. 2; also showing the adjusting mechanism of one rank of upper feeding-in rolls in section. Fig. 4 represents a plan view of the upper feeding-in rolls and the mechanism for adjusting them. Fig. 5 illustrates the matcher-works, showing the relation of the upper planing-cylinders thereto. Fig. 6 represents a cross-section of the machine, taken in the plane indicated by the broken line *y y* of Fig. 2, showing one of the pressure-bars in section. Fig. 7 represents a plan view of the duplex pressure-bar over the lower planing-cylinders. Fig. 8 is a view of a modified form of the upper pressure-bars; and Fig. 9 represents an elevation of the means for adjusting the upper planer-cylinders, with one of the operating-shafts removed. Fig. 10 represents a bottom view of the adjusting mechanism.

The same letters of reference indicate identical parts in all the figures.

The machine in its general construction is similar to the machine described in my aforesaid United States Patent No. 335,994, and parts not particularly described in this specification or omitted from the drawings may be constructed and organized in substantial accordance with the machine described in said patent.

On each side of the machine there is an upper primary feeding-in roll, A, and an upper assistant feeding-in roll, B, all of which rolls are mounted and geared, substantially as described in my aforesaid patent. Thus the machine has two ranks of upper feeding-in rolls, of which those marked B and A on one side of the machine constitute one pair, and those on the other side constitute another pair, and the machine is provided with a guideway for the material to be operated on for each of these ranks. With each of these upper feeding-in rolls is associated a lower feeding-in roll, two of which, A′ A′, are clearly shown in Fig. 3. These lower feeding-in rolls are independent of each other, like the upper feeding-in rolls with which they are associated, and being journaled in independent boxes can be adjusted independently to the limited extent required. The primary upper feeding-in rolls are suspended from a hollow girder, C, and the assistant upper feeding-in rolls from a girder, D, in exactly the same way. The two journal-boxes of each feed-roll A are suspended from the girder C by two screw-threaded spindles, E E′ and F F′, respectively. The screw-threaded portions of these spindles engage screw-threaded holes on the backs of the boxes of the upper feeding-in rolls. Screw-threaded spindles E and F terminate within the hollow girder C, and have respectively affixed to their upper ends bevel-wheels *e* and *f*. Similar bevel-wheels, *e′* and *f*,′ are affixed to the screw-threaded spindles E′ and F′, respectively,

within the hollow girder, and these spindles E′ and F′ are extended through the top of the hollow girder, and have respectively affixed to their projecting ends spur-wheels e^2 and f^2. A shaft, E^2, journaled in suitable bearings on the hollow girder C, is provided with bevel-wheels e^3 and e^4, for driving the bevel-wheels on the screw-threaded spindles E and E′. A similar shaft, F^2, also journaled in hollow girder C, is provided with bevel-wheels f^3 and f^4, for driving the bevel-wheels on the screw-threaded spindles F and F′. The outer end of shaft E^2 is provided with a hand-wheel, E^3, and the outer end of shaft F^2 is provided with a hand-wheel, F^3. A vertical stud, *c*, is provided on the top of hollow girder C, midway between the spindles E′ and F′, on which stud a spur-wheel, C′, having a handle, *c′*, may be placed as a connecting-wheel between the wheels e^2 and f^2.

It will be observed that when the connecting-wheel C′ is in gear with the wheels e^2 and f^2, both upper feeding-in rolls A A may be simultaneously adjusted from either side of the machine by turning hand-wheel E^3 or F^3, as the case may be, and that on removal of the connecting-wheel C′ either feeding-in roll A may be independently adjusted. A suspension and adjusting mechanism, precisely similar to that just described, is associated with the upper feeding-in rolls B B.

In order that all four upper feeding-in rolls may be simultaneously adjusted to like extent, the adjusting-shafts E^2 and F^2 are provided with sprocket-wheels E^4 and F^4, which are connected by drive chains E^5 and F^5 with sprocket-wheels of like diameter on the adjusting-shafts G and H of the upper feeding-in rolls B B.

The sprocket-wheels E^4 and F^4 can be slid on their respective shafts to be clutched to or unclutched from splines thereon. This arrangement of the sprocket-wheels E^4 and F^4 affords the means of adjusting the four upper feeding-in rolls either simultaneously or independently. When the interconnecting wheel C′, of each adjusting mechanism is removed, the upper feeding-in rolls on one side of the machine may also be adjusted independently of the other feeding-in rolls on the other side of the machine.

A shifter-rod, I, may be provided for shifting the sprocket-wheel on the side of the machine remote from the side where the operator stands.

The upper planing-cylinders are mounted in bearings at the sides and in the center of the bed sliding upon standards A^5. These bearings are moved upward and downward to effect the proper adjustment of the cylinders by means of the screws A^6. The cylinders are independently adjustable by means of the shafts A^7 A^8 A^9, which gear with such screws in the manner shown in Fig. 10, and serve as means of communicating motion thereto. The conjoint adjustment of these cylinders is provided by a spur-wheel, B^5, which can be attached to the crank B^6, and cause a rotation of said shafts to effect a raising or lowering of the said cylinders, as is fully described in my former patent, hereinbefore referred to.

After passing the matcher-works the boards are planed on the under side as usual. This has heretofore been effected by a single long planing-cylinder. In place of that I prefer to employ two short planing-cylinders, K K′, mounted either on a single shaft or on separate shafts, as shown in Fig. 6. Whatever style of planer for dressing the under side of the boards is employed, I associate therewith two independently-adjustable pressure-bars, L L′, for this reason—namely, that each one of the two boards may be firmly held down even though the upper planing cylinder or cylinders have not reduced them to an even thickness. The use of these separate pressure-bars over the under planer is more especially desirable on a machine like the one illustrated, in which the upper surfaces of the two boards are dressed by short upper planing-cylinders; but such separate independent pressure-bars may be used with advantage on machines which operate with a single long upper planing-cylinder. The pressure-bars L and L′ are respectively mounted on guides of a suspension-beam P, and are suspended from said beam by screws *l l′*, by which they may be independently adjusted on the beam.

The suspension-beam P is mounted on the vertical posts of a yoke, M, and is suspended from the hollow horizontal bar of the yoke by vertical screw-spindles N and N′, the upper ends of which are swiveled on the yoke and provided with bevel-wheels, which mesh with bevel-wheels on the adjusting-shaft O, mounted in the horizontal bar of the yoke. Each vertical post of the yoke is provided with a knuckle adapted to be pinned to lugs on the frame-work of the machine, so that by removing either pin the yoke, with its pressure-bars, may be turned up on the other pin, as indicated by the dotted lines in Fig. 6. It will be observed that by operating the adjusting-shaft O the suspension-beam may be raised or lowered to lift or lower the pressure-bars without changing their relative positions.

The feeding-out rolls consist of two independent upper rolls, Q Q, and two independent lower rolls. (Not shown in the drawings.) These feeding-out rolls are mounted in the same manner as the feeding-in rolls, and are provided with the same adjusting mechanism.

The herein-described mechanism for adjusting two feed-rolls, either separately or conjointly, may obviously be applied for adjusting two planing-cylinders, either separately or conjointly.

Instead of using the adjustable suspension-beam P with two independently-adjustable pressure-bars, L and L′, the beam P may be constructed as a pressure-bar and associated with a single additional pressure-bar, like L or L′, by which substantially the same result can be effected, and which I, therefore, regard as a mechanical equivalent or substitute.

I claim as my invention—

1. The combination, substantially as before set forth, of two pairs of screw-spindles, (for respectively supporting, for instance, two feed-rolls,) two independent shafts for operating said two pairs of screw-spindles, and a train of gear-wheels for connecting the two adjacent screw-spindles of the two pairs, one of which gear-wheels is removable, whereby said two pairs of screw-spindles may be adjusted either conjointly or separately.

2. The combination, substantially as before set forth, with the four adjusting-shafts, of four pairs of screw-spindles for respectively supporting four feed-rolls, and the two trains of gear-wheels, each of which trains contains a removable wheel for respectively connecting or disconnecting the two adjacent screw-spindles of each two associated pairs of said screw-spindles, and two sets of chain-gearing for connecting the four adjusting-shafts in pairs, whereby the four feed-rolls may be adjusted, either conjointly or by pairs.

3. The combination, substantially as before set forth, with the four adjusting-shafts, of four pairs of screw-spindles for respectively supporting four feed-rolls, and the two trains of gear-wheels, each of which trains contains a removable wheel for respectively connecting or disconnecting the two adjacent screw-spindles of each two associated pairs of said screw-spindles, and two sets of chain-gearing for connecting the four adjusting-shafts in pairs, one sprocket-wheel of each set of such chain-gearing being adapted to be clutched to or unclutched from its shaft, whereby the four feed-rolls may be adjusted, either separately or conjointly or by pairs or by ranks.

4. In a duplex planing-machine, the combination, substantially as before set forth, with the lower planer, of two independently as well as conjointly adjustable pressure-bars.

5. In a duplex planing-machine, the combination, substantially as before set forth, with two independent lower planing-cylinders, of two independently as well as conjointly adjustable pressure-bars.

6. In a duplex planing-machine, the combination, substantially as before set forth, with two upper planing-cylinders and the lower planer, of two independently as well as conjointly adjustable pressure-bars over the lower planer.

7. In a duplex planing-machine, the combination, with two independently-adjustable top planing-cylinders placed over different longitudinal vertical sections of the bed-plate of the machine, of a lower planer and two independently and conjointly adjustable pressure-bars coacting with said lower planer, substantially as described.

8. In a duplex planing-machine having two guideways for separate pieces of material, the combination, with two independently-adjustable top planing-cylinders, one for each guideway, of a lower planer and two conjointly and independently adjustable pressure-bars coacting with said lower planer, substantially as described.

9. In a duplex planing-machine having two guideways for separate pieces of material, the combination, with two independently-adjustable top planing-cylinders, one for each guideway, of two lower planing-cylinders and two independently and conjointly adjustable pressure-bars coacting with said lower planing-cylinders, substantially as described.

10. In a duplex planing-machine, the combination, with a lower planer mounted in bearings in the main frame, of two independently and conjointly adjustable pressure-bars, each adjustment being positive, each of said pressure-bars coacting with a different longitudinal portion of the lower planer, substantially as described.

11. In a planing-machine, the combination, with a lower planer consisting of two independent planing-cylinders, each of said cylinders occupying different longitudinal sections of the machine, of two independently and conjointly adjustable pressure-bars coacting with said cylinders, substantially as described.

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

WILLIAM H. DOANE.

Witnesses:

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ALBERT STEPHAN.