Aug. 20, 1935. F. LOSKE 2,012,104

AEROPLANE

Filed June 14, 1934 4 Sheets-Sheet 1

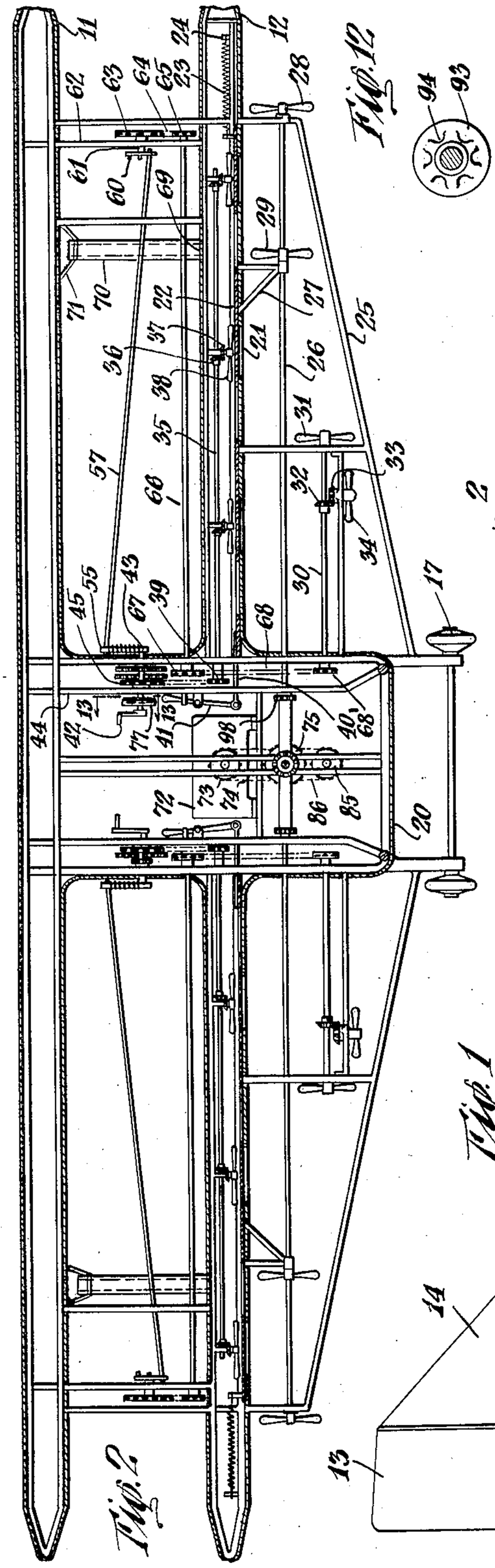

Fig. 2

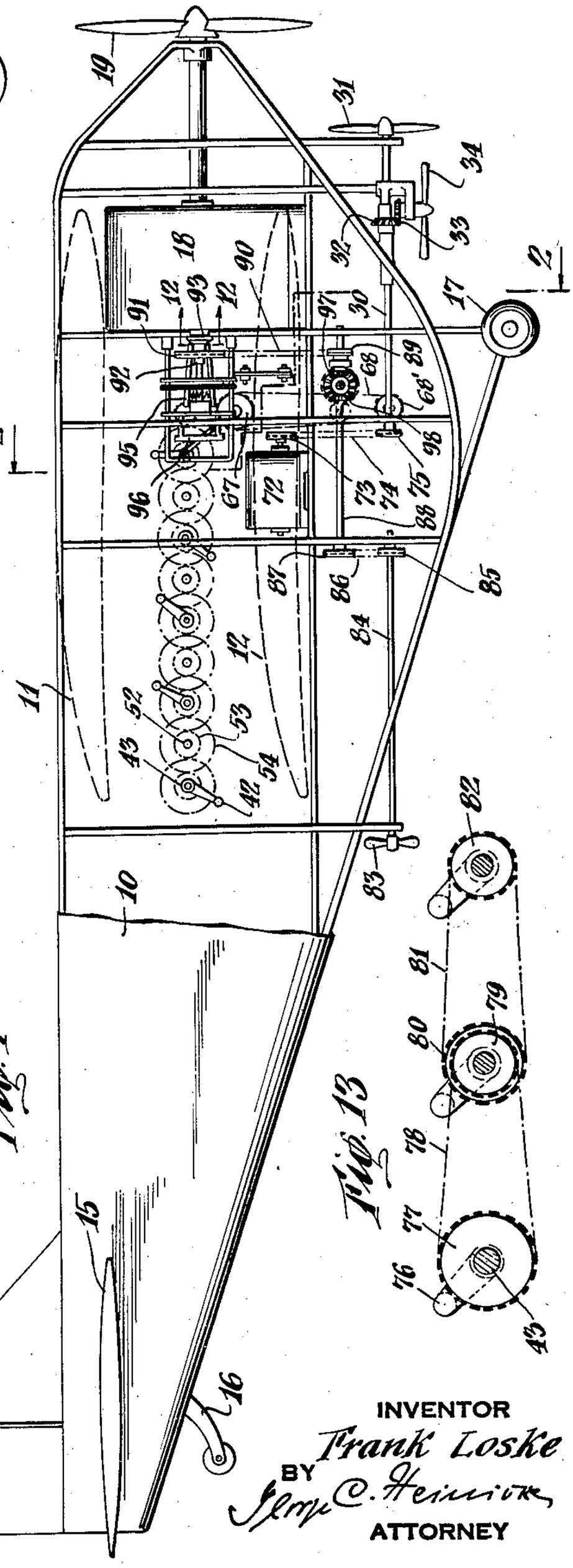

Fig. 1

Fig. 12

Fig. 13

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AEROPLANE

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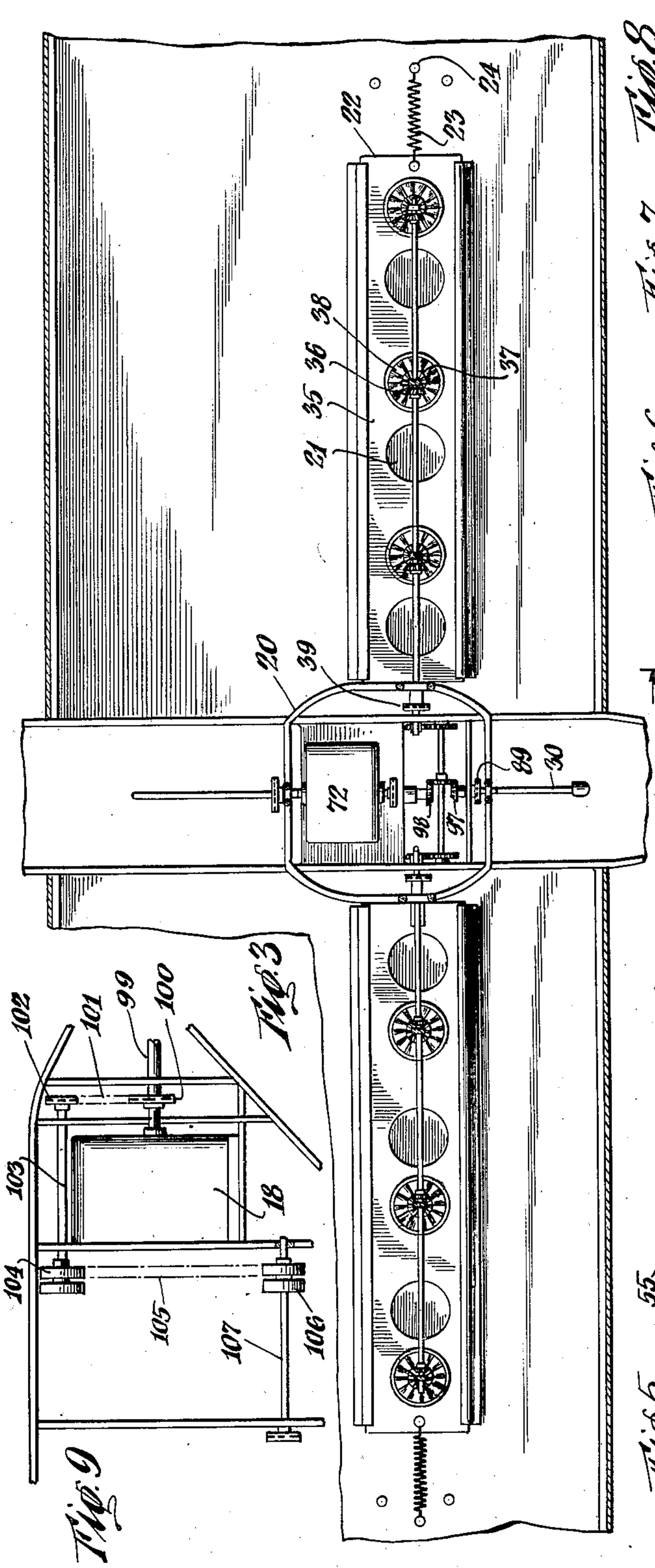

Fig. 3

Fig. 9

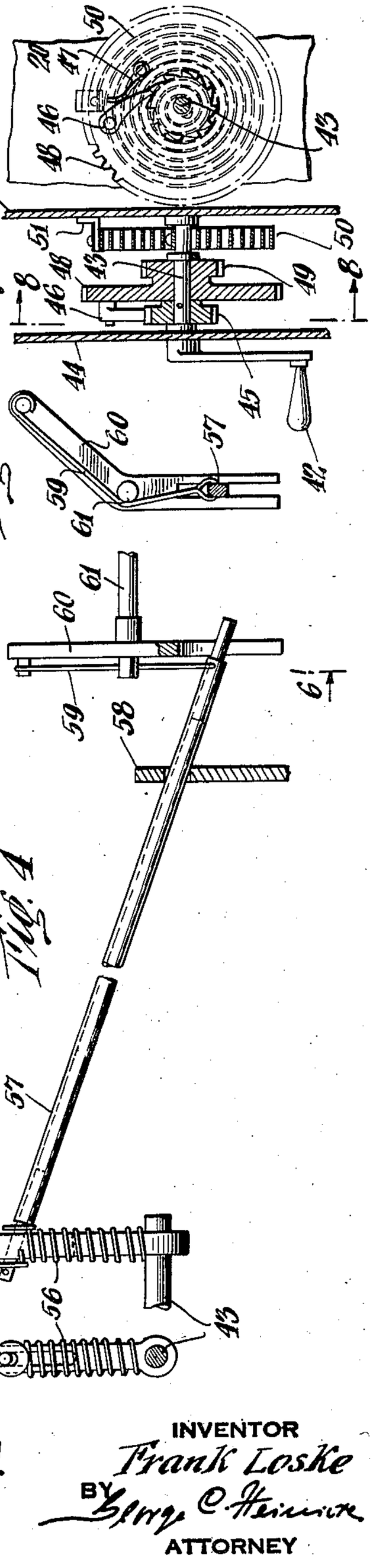

Fig. 8

Fig. 7

Fig. 6

Fig. 4

Fig. 5

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AEROPLANE

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Fig. 10

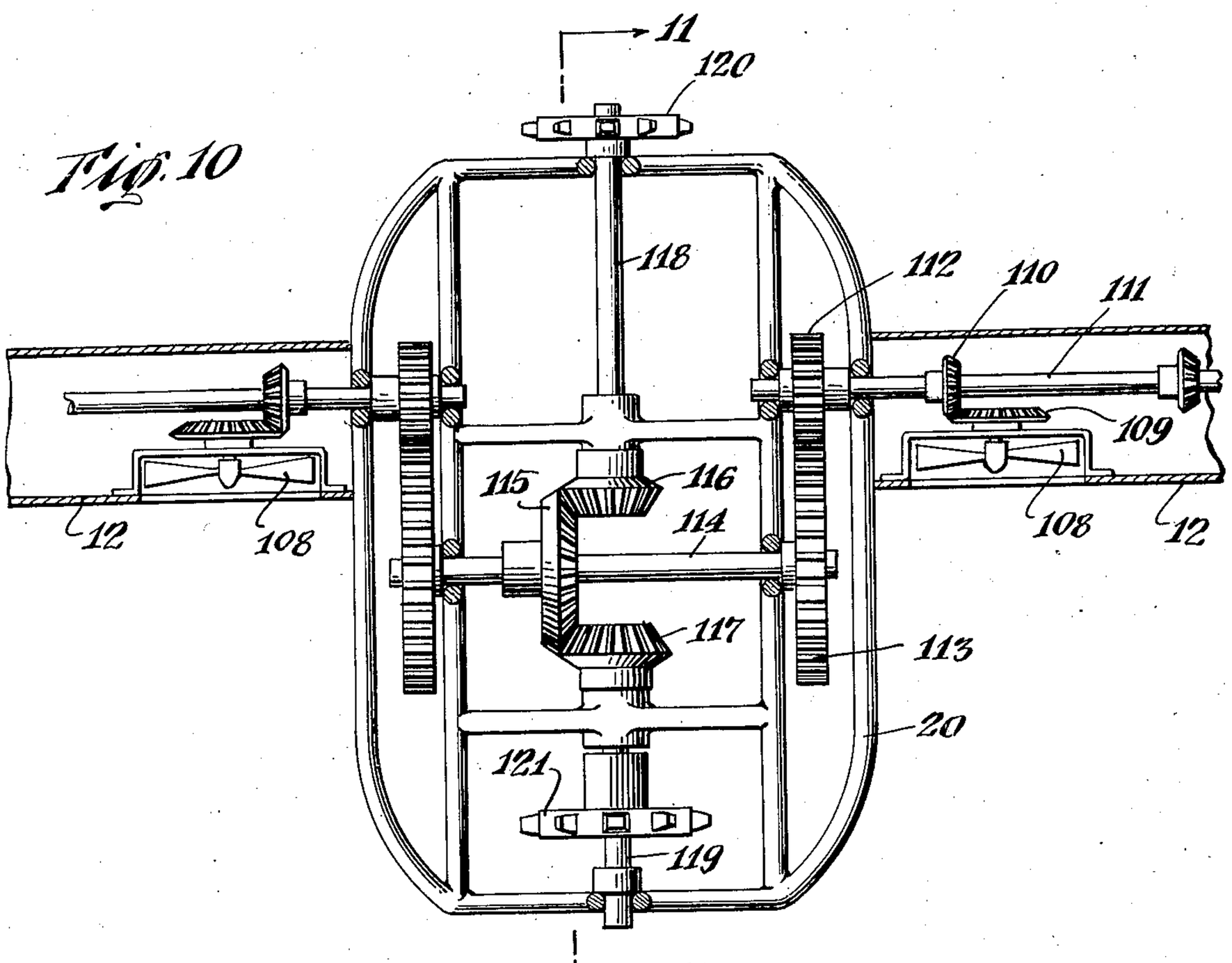
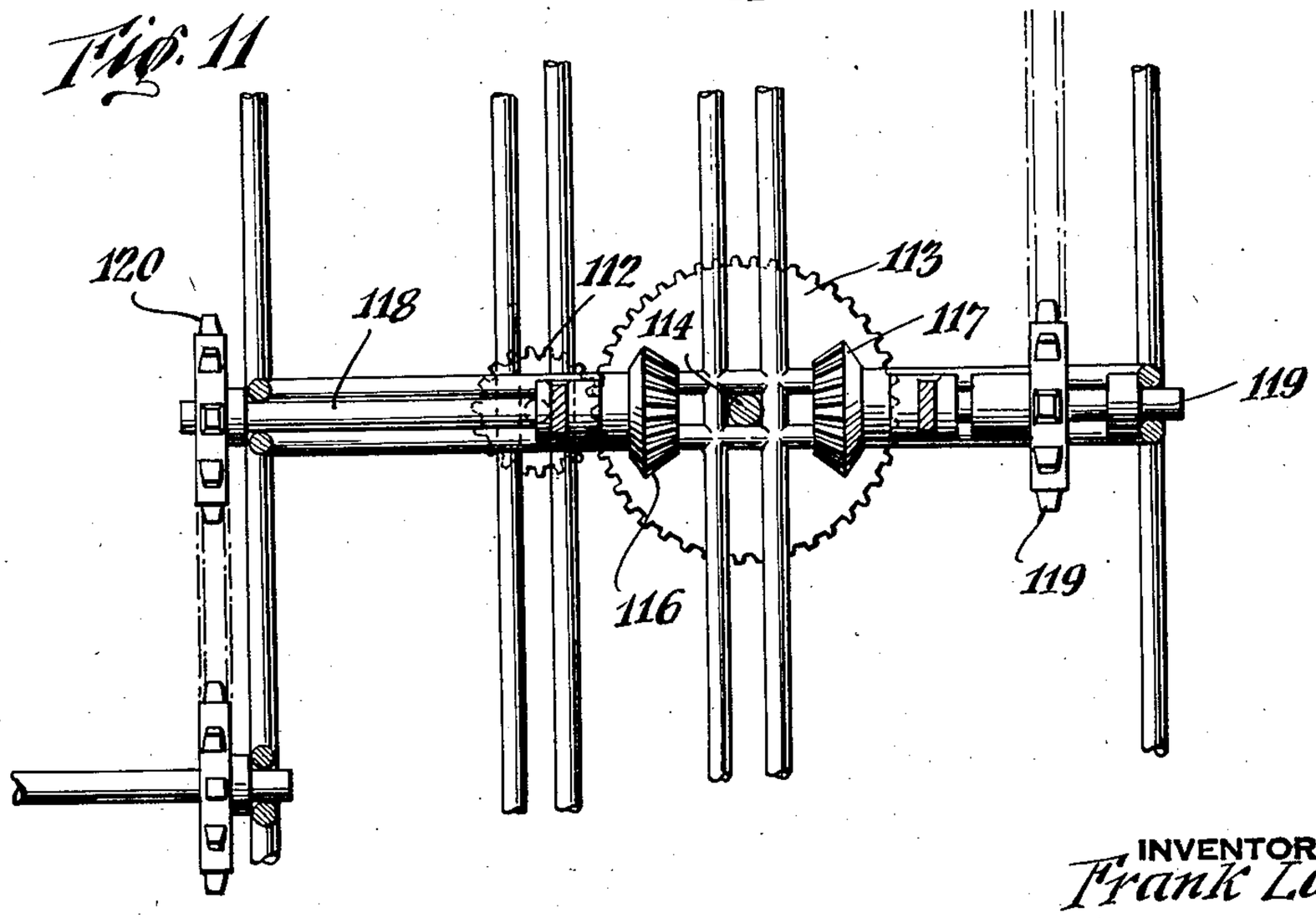


Fig. 11



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AEROPLANE

Filed June 14, 1934 4 Sheets-Sheet 4

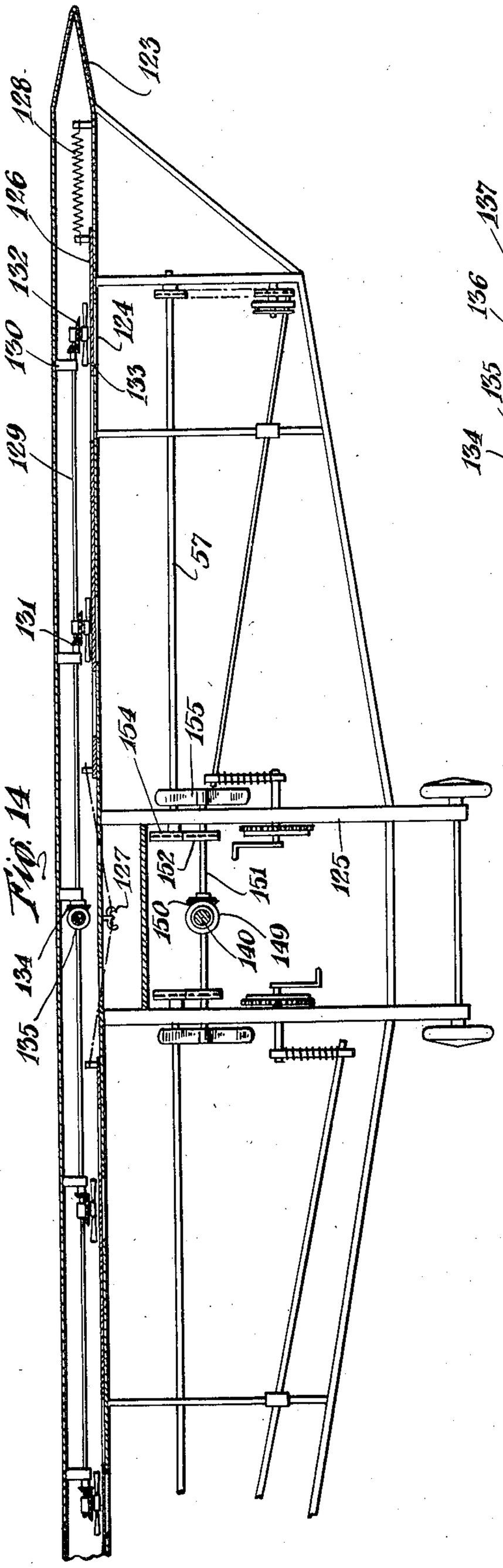

Fig. 14

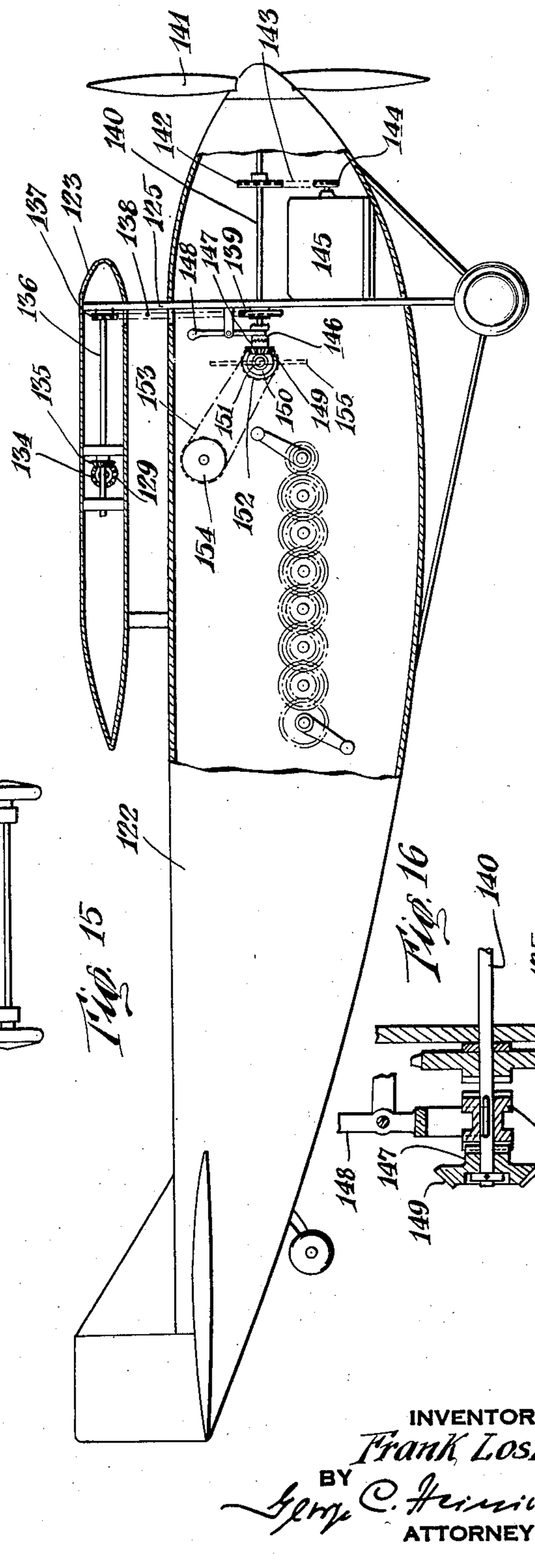

Fig. 15

Fig. 16

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UNITED STATES PATENT OFFICE

2,012,104

AEROPLANE

Frank Loske, Brooklyn, N. Y.

Application June 14, 1934, Serial No. 730,577

3 Claims. (Cl. 244—25)

This invention relates to an aeroplane either for use as such for the transportation of passengers and freight, or which, when constructed on a smaller scale may be suitably used as a toy.

It is the principal object of my invention to provide the aeroplane with a plurality of auxiliary propellers which, in case the motor is stalled, can be driven by the intermediary of a plurality of hand operated, spring power developing, and gear actuated means, or by an auxiliary motor to prevent a too rapid descent of the aeroplane.

Another object of my invention is the provision of an aeroplane of this type including a novel power developing shaft arrangement for driving the auxiliary propellers either by a hand operated spring controlled system of gears or by an auxiliary motor.

Still another object of my invention is the provision of an aeroplane equipped with hollow wings having openings in the bottom thereof normally closed by a spring controlled sliding plate while wind wheels arranged in alignment with these openings are operated by air pressure during a rapid descent of the aeroplane to slacken its speed.

A further object of my invention is the provision of an aeroplane provided with a novel and improved clutch for clutching or declutching an auxiliary propeller drive to or from the motor drive.

A still further object of my invention is the provision of an aeroplane with a centrally located cabin in which the manually operated, spring controlled gear arrangement is located.

It is also an object of my invention to provide an aeroplane equipped with a motor, which, by means of a clutch, may be conveniently cut out so that the aeroplane may then be propelled by hand or be used as a glider.

These and other object and advantages of my invention will become more fully known as the description thereof proceeds and will then be specifically defined in the appended claims.

In the accompanying drawings forming a material part of this disclosure:

Fig. 1 is a side elevation of an aeroplane constructed according to my invention, part of the body being broken away to illustrate the interior arrangement.

Fig. 2 is a sectional front elevation thereof, the section being taken on line 2—2 of Figure 1.

Fig. 3 is a fragmentary bottom plan view of the lower wing.

Fig. 4 is a detail view of a power developing shaft arrangement.

Fig. 5 is a sectional front elevation thereof.

Fig. 6 is an inner view of a rear end of the arrangement Figure 4 seen in the direction of arrows 6—6 of Figure 4.

Fig. 7 is a sectional side elevation of a manually operated propeller, spring power developing propulsion system.

Fig. 8 is an inner view thereof seen in the direction of arrows 8—8 of Figure 7.

Figure 9 is a modified form of motor arrangement.

Fig. 10 is a modified form of a wind wheel drive.

Fig. 11 is a central section through the drive Figure 10, the section being taken on line 11—11 of Figure 10.

Fig. 12 is a sectional inner view of a coupling member, the section being taken on line 12—12 of Figure 1.

Figure 13 is a sectional detail view of a manually operated propulsion system in section on line 13—13 of Figure 2.

Fig. 14 is a front elevation of an aeroplane with a removable motor for manual propulsion.

Fig. 15 is a sectional side elevation thereof.

Fig. 16 is a sectional side elevation of a clutch.

As illustrated, an aeroplane of any customary bi-plane type has its body 10 equipped with the normal upper and lower wings 11 and 12, rudder 13, vertical stabilizer 14 and horizontal stabilizers 15, tail skid 16 and front landing gear 17.

The fuselage of the aeroplane carries a main motor 18 driving the main propeller 19 in the usual manner.

The wings are preferably hollow, and the lower wing 12 is provided to either side of the cabin 20 with a plurality of openings 21 adapted to be closed by a sliding plate 22 having similar openings and displaceable in suitable guides, while a spring 23 having its ends connected to pins 24 tends to draw the plate 22 into a position to close openings 21.

The fuselage frame 25 carries also to either side of cabin 20 a shaft 26 in suitable bearings 27 for auxiliary propellers 28, 29 and a shaft 30 for a propeller 31. Shaft 30 for propeller 31 carries also a bevel gear 32 in mesh with a bevel gear 33 on the shaft of propeller 34.

In the lower wing 12, to both sides of the cabin 20 a shaft 36 is journaled carrying at certain intervals bevel gears 36 in mesh with bevel gears 37 on the shafts of wind wheels 38 above the openings 21. The inner end of shaft 36 carries a gear or pinion 39.

The slide plate 22 has a rod 40 attached to its inner end which is adapted to be operated by a

hand lever 41 to serve the plate inwardly against the action of spring 23 to uncover the openings 21 in the lower wing 12.

The manual operation of the auxiliary propellers is effected by means of the following construction: A plurality of cranks 42 are arranged in the cabin 20 each attached to the outer end of a spindle 43 journaled in the inner wall 44 and the outer wall of the cabin 20.

The spindles 43 of the cranks of the entire system carry each a small ratchet gear 45, in which a pawl 46 is engaged and held in engagement by means of a spring 47, and a large gear 48 integral with a smaller gear 49, while a spiral spring 50 is secured with one end to spindle 43, while its other end is attached to a bracket 51 in the cabin wall.

Between each two crank shafts of the system, as shown in Figure 1, spindles 52 carrying smaller gears 53 and larger gears 54 in mesh with the gears on the crank shafts are arranged.

To increase the power developed, I attach to the outer ends of spindles 43, a forked member 55 about which a spring 56 is wound between the lower enlarged head and the inner end of an inclined rod 57 guided in the space between the forks of member 55.

The inclined rod or shaft 57 is guided intermediate its ends in a bearing 58, while its outer end is suspended by means of a spring 59 between the forks at the lower end of a knee member 60 in which a shaft 61 is attached, journaled in a brace 62 between wings 11 and 12.

Shaft 61 carries a chain gear 63 over which a chain 64 is guided which is also guided over a gear 65 on shaft 66 carrying at its other end a gear 67 over which a chain 68 is guided, also guided over a gear 68 at the inner end of shaft 30 driving auxiliary propellers 31 and 34.

In alignment with the openings 21 in the bottom of wing 12, similar openings 69 are arranged in the top of the wing over which vents or flues 70 are provided ending below wing 11 and braced against the same by means of braces 71.

As previously mentioned, I have described the drive on one side of the cabin 20 only, and that a drive as aforedescribed is also arranged on the opposite side of cabin 20.

The auxiliary motor drive is constructed as follows:

The shaft of the auxiliary mtor 72 carries a chain gear 73 over which a chain 74 is guided, also guided over a sprocket wheel 75 at the inner end of shaft 30.

While the cranks 42, and the gear construction operated thereby are chiefly designed to give the springs a tension necessary to develop the desired driving power, this power is then usefully employed by means of the arrangement illustrated in Figure 13 according to which the spindles 43 carry also a number of cranks 76 operating a sprocket wheel 77 over which a chain 78 is guided which is also guided over a sprocket wheel 79 on the neighboring shaft 43 which also carries a sprocket wheel 80 over which a chain 81 is guided also guided over a sprocket wheel 82 on the adjacent shaft 46 and so forth, if necessity requires.

In order to assist the forwards drive of the aeroplane a propeller 83 is provided on a shaft 84 journaled in the fuselage and carries a sprocket wheel 85 at its inner end over which a chain 86 is guided also guided over a sprocket wheel 87 on a shaft 88 which carries also a sprocket wheel 89 over which a chain 90 is guided also running over a sprocket wheel 91 on a shaft or spindle 92 which can be clutched to or be declutched from the shaft of the main motor by means of the following clutching mechanism:

The motor shaft carries a disc 93 having a plurality of openings 94 arranged in a circle about the motor shaft and adapted to be engaged by the outer ends of bars or rods 95, the inner ends of which are held apart by means of a spring and the rods are pushed in and out of engagement with the openings in disc 93 by means of a handle 96.

Shaft 88 also carries a bevel gear 97 in mesh with a bevel gear 98 on shaft 26 so that also auxiliary propellers 28, 29 can be driven from the main motor.

In Figure 9, I have disclosed a modified form of belt drive from the main motor 18, the shaft 99 of which carries a sprocket wheel 100 over which a belt 101 is guided, also guided over a sprocket wheel 102 on shaft 103 carrying belt pulleys 104 having a driving connection by means of a belt 105 with belt pulleys 106 on shaft 107.

In Figures 10 and 11, I have shown a modified form of drive for the propellers 108 which are in this form replacing the wind wheels 38, the shafts for which carry bevel gears 109 with which bevel gears 110 on shafts 111 cooperate, the inner ends of which carry gears 112 in mesh with gears 113 on a shaft 114 journaled in a frame in cabin 20. Within this frame the shaft 114 carries a bevel gear 115 in mesh with gears 116 and 117, on shafts 118 and 119 respectively carrying sprocket wheels 120 and 121 respectively from which are driven the auxiliary propellers.

The device operates as follows:

If for one or the other reason the main motor is stalled and the aeroplane starts to descend, the springs 50 are tensioned by the operation of the handles 42 and as soon as enough power has been developed, the same is transmitted by means of the operation of handles 76 and the power developing device illustrated in Figures 5, 6 and 7 to operate auxiliary propellers 31 and 34. The rotation of shaft 43 will also rotate the inner end of the spring cushioned slanting shaft 57, the outer end of which is suspended between the prongs of the forked lower end of knee member 60 to which shaft 61 is attached so that the inner end of shaft 57 describes a larger arc of rotation than its outer end and will therefore impart to shaft 61 an increased velocity as it describes a much smaller arc than its other end, and thus the power developed will be greatly increased for the operation of the auxiliary propellers 31 and 34 through the intermediary of the train of gears 63, 64, 65, 66, 67, 68 and 68'.

During the descent, the wind wheels 38 will be operated by virtue of the air engaging the same from below to brake the descent which is further retarded by the air rising in the tubes 70 and engaging the upper wing 11.

The aeroplane in case of accident may also be driven by means of the auxiliary motor 72 through the intermediary of the gear and belt drives for the auxiliary propellers.

If the flight of the aeroplane in a forward direction is to be assisted by the rear propellers 83 the same may be clutched by the operation of the clutch rods 95 to the motor shaft.

As illustrated in Figures 14, 15 and 16, the aeroplane has a substantially similar construction as the aircraft illustrated in Figures 1 and 2 with the exception that the motor 122 is re-

movable or can be cut off, and the aeroplane in that case may then be manually propelled.

The aeroplane 122 preferably of the monoplane type has a hollow wing 123, the bottom part of which has a plurality of openings 124 to both sides of the cabin 125 adapted to be closed by means of slide plates 126 having similar openings and operated by means of the central control and locking member 127 normally holding the openings of slide plates and bottom of wing in alignment against the action of springs 128 tending to slide plates 126 into position to close openings 124.

Within the wing 123 a shaft 129 is journaled in suitable bearings or hangers 130 and carries at certain intervals bevel gears 131 in mesh with bevel gears 132 on the shafts of propeller 133 located above the openings 124.

The shaft 129 carries in its center a bevel gear 134 in mesh with a bevel gear 135 on a shaft 136 carrying a sprocket wheel 137 over which a chain 138 is guided which is also guided over a sprocket wheel 139 upon the shaft 140 carrying the propeller 141.

Shaft 140 carries also a chain wheel 142 about which a chain or belt 143 is guided which is also guided over a sprocket wheel 144 on the shaft of a motor 145.

A clutch composed of members 146, 147 on shaft 140 is adapted to be operated by a shifter 148 to bring bevel gear 149 on clutch member 147 in or out of engagement with a bevel gear 150 on shaft 151 which also carries a sprocket wheel 152 around which a chain or belt 153 is guided which is also guided over a sprocket wheel 154 on the shaft 57 of the power developing device illustrated in Figure 1 and described above.

A pair of propeller blades 155 on shafts 151 are intended to give additional impetus during the flight of the aeroplane without motors.

The spring tensioning and auxiliary propeller operating means in this form of my invention are the same as those described with respect to Figures 1 and 2.

It will be understood that I have described and shown the preferred forms of my invention only as a few examples of the many possible ways to practically construct my aeroplane and that I may make such changes in the general arrangement thereof and in the construction of its minor details as come within the scope of the appended claims without departure from the spirit of my invention and the principles involved, so for instance, I can conveniently replace the chain drives by belt drives, etc.

Having thus described my invention what I claim as new and desire to secure by Letters Patent is:

1. A motor propelled aeroplane comprising hollow wings, the lower of said wings provided with a plurality of openings, a spring controlled slide plate having similar openings as the wing, but normally closing the openings in said wing, a means to operate said slide plate to bring the openings in wing and slide plate into alignment, wind wheels above said openings in the said wing having their shafts equipped with bevel gears, and a motor operated shaft in said hollow wing carrying bevel gears in mesh with the bevel gears on the wind wheel shafts to operate said wind wheels when the openings in wing and slide plate are in alignment for retarding the descent of the aeroplane when its motor stalls, and air tubes in the top of the hollow wing above the openings therein ending below the upper wing to assist said wind wheels in the braking of the descent.

2. In motor operated aircraft, including a cabin, auxiliary propellers on their shafts to be operated in cases of emergency when the motor stalls, manually operated crank shafts, and a means to increase the power developed thereby, said means comprising a forked member attached to the outer end of said crank shaft, an inclined rod having one of its ends guided in the fork of said member, a forked knee member in the fork of which the other end of said inclined rod is suspended by means of a spring, said inclined shaft to be rotated upon the manual operation of said crank shafts, with increased velocity at its end guided in the forked knee member, and a means to transmit the power developed to the spindles of said auxiliary propellers.

3. In a motor operated aeroplane, a motor driven front propeller, and an auxiliary rear propeller, a drive for said auxiliary rear propeller including a sprocket wheel and its spindle, a means to couple and uncouple the drive for said auxiliary propeller to and from the shaft of the motor driven frontal propeller, said means comprising a disc on the motor shaft having a plurality of openings arranged in a circle about said motor shaft, bars or rods engaging with their outer ends the openings in said disc, a spring for holding the inner ends of said rods apart, and a handle engaging said rods to compress said springs to engage the spindle of the sprocket wheel with the shaft of the front propeller to couple the same with the auxiliary propeller.

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