

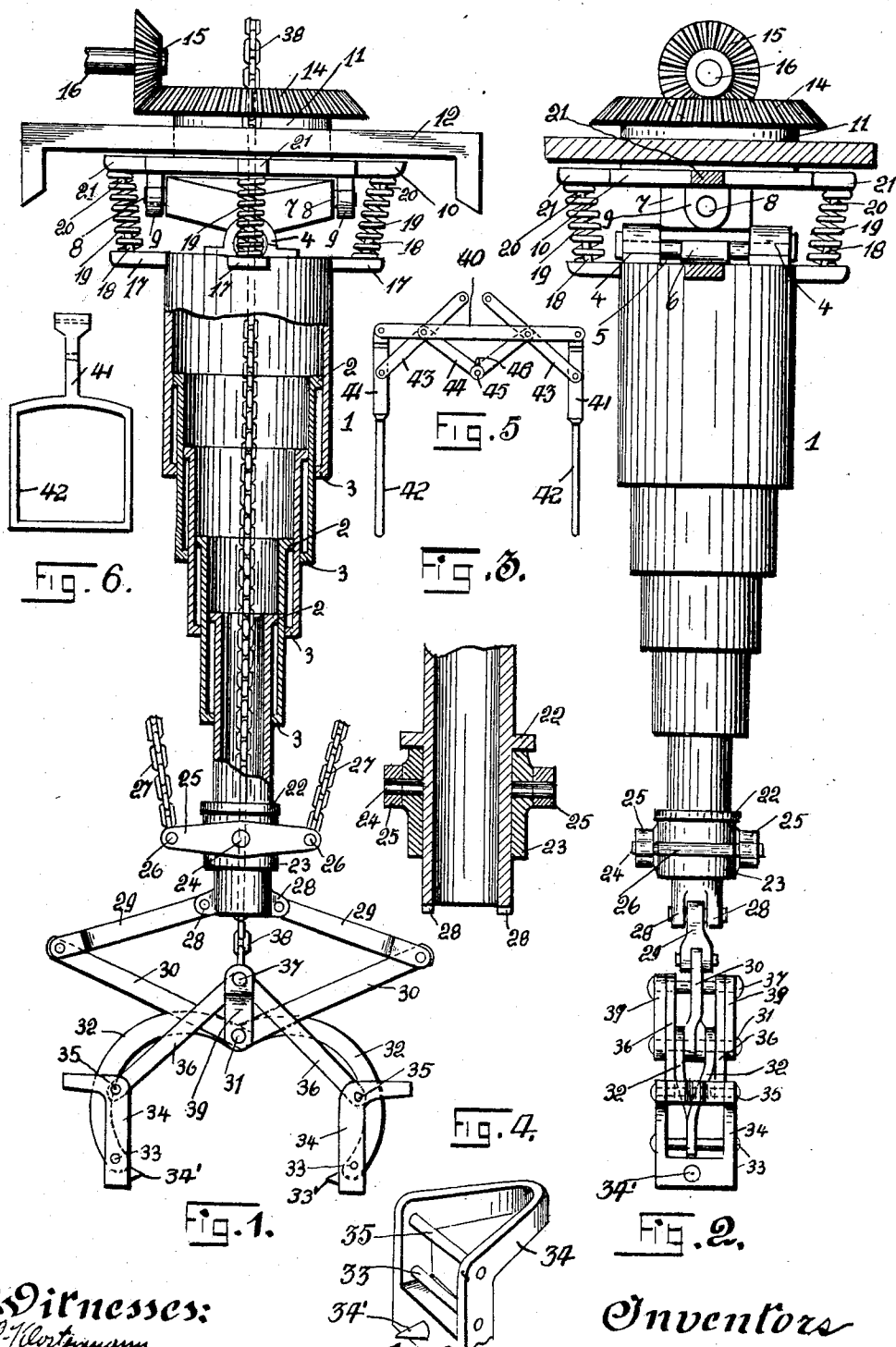
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PATENTED AUG. 8, 1905.

G. M. HOFFMANN & J. NAMET.

CRANE.

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# UNITED STATES PATENT OFFICE.

GEORGE M. HOFFMANN, OF HOMEVILLE, AND JULIUS NAMET, OF HOMESTEAD, PENNSYLVANIA.

## CRANE.

No. 796,842.

Specification of Letters Patent.

Patented Aug. 8, 1905.

Application filed November 15, 1904. Serial No. 232,881.

*To all whom it may concern:*

Be it known that we, GEORGE M. HOFFMANN, a citizen of the United States of America, residing at Homeville, and JULIUS NAMET, a subject of the Emperor of Austria-Hungary, residing at Homestead, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Cranes, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to certain new and useful improvements in cranes, and has for its primary object the provision of a crane by means of which different-sized pieces of material may readily be grasped and manipulated or carried without necessitating or requiring a change of the gripping-jaws.

Another object of our invention is to provide an expansible boom, together with means for collapsing or extending the boom to the desired position to readily grasp an object.

The invention will be more fully understood as it is further described herein, and in such description reference will be had to the accompanying drawings, forming a part of this application, wherein like numerals of reference designate corresponding parts throughout the several views, in which—

Figure 1 is an elevation of a crane constructed in accordance with our invention, showing the boom-arm partly in section. Fig. 2 is a side elevation showing the platform in section. Fig. 3 is a central vertical sectional view of a part of the boom-arm. Fig. 4 is a detached detail perspective view, partly broken away, of one of the gripping-jaws. Fig. 5 is a detached detail view, in side elevation, of a modified form of gripping jaws or tongs. Fig. 6 is a detached detail view of one of the tongs used in this modified form of construction.

To put our invention into practice, we provide a boom-arm 1, which is made of a series of telescoping sections, the sections decreasing in size toward the lower end of the boom-arm in stepped order and each section, except the lowermost section and the uppermost section, being provided at their upper ends with an annular external flange 2 and at their lower ends with an annular internal flange 3. It will of course be evident that on the upper section it is necessary only to provide the annular internal flange 3, while on

the lowermost section it is necessary to provide only the external annular flange 2. The uppermost section of the collapsing boom-arm carries bearings 4, through which is passed a pin or shaft 5. This pin or shaft 5 is also received in a lug 6, carried by a cross-head 7, which has short stub-shafts 8 on its end, that are trunnioned in lugs 9, carried by a bracket 10. This bracket 10 is firmly secured to the lower end of a sleeve 11, mounted in the platform 12, on which platform the motor (not shown) is arranged. The sleeve 11 is provided with a beveled gear 14, with which meshes a beveled pinion 15, carried on the armature-shaft 16 of the motor.

The upper section of the collapsible boom-arm is provided near its upper end with a plurality of peripherally-arranged outwardly-extending arms or lugs 17, which carry pins 18, that receive the lower ends of stiff coiled springs 19, the upper ends of these springs being received on pins 20, carried by outwardly-extending lugs 21, carried by the bracket 10.

The lower section of the collapsible boom-arm is provided at a point near its lower end with an annular flange or collar 22, which may be integral therewith, as shown, or may be, if desired, a separate collar secured thereon. This collar 22 acts as a stop for a sleeve 23, mounted on the lowermost section of the boom-arm and having secured to its opposite sides by pins 24 links or cross-heads 25, these links or cross-heads being connected at their ends by rods 26, to which are attached the lower ends of the lifting-chains 27, these chains passing to drums or pulleys. (Not shown.) The lowermost section of the collapsible boom-arm is also provided at its lower end with apertured lugs or ears 28, in which are pivotally connected the upper ends of links 29, bifurcated at their lower ends to receive the upper end of links 30, pivoted therein. The lower ends of these links 30 are pivoted on a common shaft 31, on which shaft are also pivoted the upper ends of curved jaw-carrying arms 32, the arm on one side being rigidly connected to the link 30 on the other side. There are two of these jaw-carrying arms, and each is pierced by a pin or shaft 33, passing through the gripping-jaws 34. These gripping-jaws 34 also carry pins or shafts 35, to which the lower ends of links 36 are pivotally connected. The jaws are preferably provided with

gripping-spurs 34'. The upper ends of the links 36 are pivoted to a shaft 37, to which the operating-chain 38 of the jaws is attached, a hanger 39 connecting the shaft 37 and shaft 31. The operating-chain 38 passes upwardly through the collapsible boom-arm and through the sleeve 11 and wheel 14 to a hoisting or other device. (Not shown.)

In operation the boom-arm is lengthened or shortened to bring the gripping-jaws to the desired position by the unwinding of the chains 27 upon their drums, and the boom-arm and the jaws are rotated to bring the jaws into proper position for gripping a desired object by the gears 14 and 15, as shown. When the boom-arm and jaws have been properly positioned over the piece to be gripped, the jaws are closed by the winding up of chain 38, which, through the medium of links 36 32, hanger 39, and shafts 31 and 37, causes the jaws 34 to be moved toward each other, moving in the same plane to grip against the opposite sides of the piece of material.

Heretofore in the use of cranes, particularly in iron and steel mills, where many different sizes of pieces are to be carried by the cranes, it has been the common practice to employ gripping-jaws of different sizes and use a jaw of the proportionate size to the piece of material being gripped. By the construction of jaws herein shown and described it will be observed that the same jaw may be employed for the gripping of larger or smaller pieces of material, the gripping-jaws being so arranged that when fully opened a piece of larger size may be admitted and gripped and the jaws so hung that a sufficient winding of the chain 38 will cause the same to be almost or entirely closed in order to grip a piece comparatively smaller in size. In order to prevent lateral swinging of the boom-arm to an undue extent during the operation, we provide the stiff coiled springs 19, disposed at the four opposite sides, so that the swinging movement of the boom-arm in any direction will be controlled.

In Figs. 5 and 6 we show a form of gripping-tongs which may be employed for the convenient handling of certain objects. In this construction we employ an open frame 40, in the ends of which are pivoted the shanks

41 of the gripping-tongs 42. Links 43 have their lower ends pivoted to the shanks 41 of the tongs, and their upper ends are pivoted in the lugs 28. Links 44 have their upper ends pivoted intermediate the ends of the links 43 and their lower ends pivoted on a shaft 45, which also carries a hook or staple 46. In using this device the chain 38 is detached from the shaft 37 and links 29 are detached from the lugs 28. The upper ends of the links 43 are then secured in lugs 28, and the chain 38 is engaged at its lower end with the hook or staple 46. The operation of the tongs thereafter is the same as that heretofore described for the gripping-jaws.

It will be noted that various changes may be made in the details of construction without departing from the general scope of the invention.

What we claim, and desire to secure by Letters Patent, is—

1. In a crane, a collapsible boom-arm rotatably mounted and suspended so as to swing from a platform, gripping-jaws pivotally connected together and suspended from the boom-arm, and means for moving the gripping-jaws toward and from the boom-arm, and for simultaneously opening and closing the same.

2. In a crane, a boom-arm comprising telescoping sections rotatably supported from and suspended so as to swing from a platform, and means for telescoping the sections one within the other.

3. In a crane, a boom-arm comprising telescoping sections suspended so as to swing, gripping-jaws pivotally suspended from the boom-arm, and means for limiting the swinging movement of the boom-arm.

4. In a crane, a boom-arm suspended so as to swing and rotate, means for limiting independent swinging movement of the boom-arm, and gripping-jaws pivotally suspended from the boom-arm.

In testimony whereof we affix our signatures in the presence of two witnesses.

GEORGE M. HOFFMANN.  
JULIUS NAMET.

Witnesses:

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